Initial Environmental Examination (Draft)

PUBLIC

October 2024

Bangladesh: Strengthening Agricultural Tertiary Education Project

Prepared by the Secondary and Higher Education Division of the Ministry of Education acting through University Grants Commission for the Asian Development Bank. {This is an {updated} {revised} version of the draft originally posted in {Month Year} available on {http://www.adb.org/projects/xxxxx-xxx/documents}.}

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CURRENCY EQUIVALENTS

(as of 27 August 2024)

Currency unit	–	Taka (Tk)
Tk1.00	=	$0.0084
$1.00	=	Tk119.60

ABBREVIATIONS

ACGIH	-	American Conference of Governmental Industrial Hygienists
ACM	-	asbestos-containing material
ADB	-	Asian Development Bank
ASCE	-	American Society of Civil Engineers
ASTM	-	American Society for Testing Materials
BAU	-	Bangladesh Agricultural University
BAURES	-	BAU Research System
BBBS	-	Bangladesh Biosafety and Biosecurity Society
BBS	-	Bangladesh Bureau of Statistics
BCCSAP	-	Bangladesh Climate Change Strategy and Action Plan
BCP	-	business continuity plan
BDD	-	back draft damper
BFRI	-	Bangladesh Fish Research Institute
BIISC	-	BAU innovation, incubation, and startup center
BMD	-	Bangladesh Meteorology Department
BWDB	-	Bangladesh Water Development Board
CAP	-	corrective action plan
CEMP	-	construction environmental management plan
DED	-	detailed engineering design
DMP	-	disaster management plan
DOE	-	Department of Environment
DPD	-	Deputy Project Director
DPP	-	development project proposal
EA	-	executing agency
EBRD	-	European Bank for Reconstruction and Development
ECC	-	environmental clearance certificate
EDCF	-	Economic Development Cooperation Fund
EDGE	-	Excellence in Design for Greater Efficiencies
EHS	-	environmental health and safety
EIA	-	environmental impact assessment
EMOP	-	environmental monitoring plan
EMP	-	environmental management plan
EMR	-	environmental monitoring report
EN	-	Euro Norm
EOHS	-	environmental and occupational health and safety
ERA	-	environmental risk assessment
ERDMP	-	emergency response and disaster management plan
ERP	-	emergency response plan
ESIA	-	environmental and social impact assessment
ESMP	-	environmental and social management plan
FAO	-	Food and Agricultural Organization
FAQ	-	frequently asked questions

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FI	-	financial intermediary
GDP	-	gross domestic product
GE	-	genetically engineered
GHG	-	greenhouse gas
GHI	-	global horizontal irradiance
GP	-	government procurement
GRC	-	grievance redress committee
GRM	-	grievance redress mechanism
GRS	-	grievance redress system
H&SP	-	health, and safety plan
HAVS	-	hand-arm vibration syndrome
HCDI	-	Haor and Char Development Institute
HPLC	-	high- performance liquid chromatograph
HVAC	-	heating, ventilation, and air-conditioning
IA	-	implementing agency
ICDDR	-	International Centre for Diarrhoeal Disease Research
ICT	-	information and communication technology
IEC	-	International Electrotechnical Commission
IEE	-	initial environmental examination
IEEE	-	Institute of Electrical and Electronics Engineers
IESE	-	initial environmental and social examination
IFC	-	International Finance Corporation
IIFS	-	Interdisciplinary Institute for Food Security
ILAC	-	International Laboratory Accreditation
IPP	-	Indigenous Peoples plan
KEXIM	-	Korea Export-Import Bank
LCC	-	locational clearance certificate
M&E	-	monitoring and evaluation
MOE	-	Ministry of Education
MOEFCC	-	Ministry of Environment, Forest, and Climate Change
MOU	-	memorandum of understanding
MPO	-	Master Plan Organization
MTR	-	midterm review
NICEM	-	National Instrumentation Center of Environmental Management
NOC	-	no-objection certificate
O&M	-	operation and maintenance
OHS	-	occupational health and safety
PAI	-	project area of influence
PCR	-	project completion report
PD	-	project director
PIC	-	project implementation committee
PMU	-	project management unit
PPE	-	personal protective equipment
PSC	-	project steering committee
PV	-	photovoltaic
Q&A	-	questions & answer
R&D	-	research and development
REA	-	rapid environmental assessment
RP	-	resettlement plan
SATEP	-	Strengthening Agricultural Tertiary Education Project
SEAH	-	sexual exploitation, abuse, and harassment

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SHED	-	Secondary and Higher Education Division
SNU	-	Seoul National University
SPP	-	Sustainable Procurement Policy
SRDI	-	Soil Resources Development Institute
SREDA	-	Sustainable and Renewable Energy Development Authority
TA	-	technical assistance
TEC	-	tender evaluation committee
TML	-	Tranche Management Limited
TOR	-	terms of reference
UGC	-	University Grants Commission
UL	-	Underwriters Laboratories
UNFCCC	-	United Nations Framework Convention on Climate Change
US	-	United States
VOC	-	volatile organic compound
WB	-	World Bank
WHO	-	World Health Organization

WEIGHTS AND MEASURES

^{o}C	–	degree Celsius
dB(A)	–	A-weighted decibel
ha	–	hectare
km	–	kilometer
km^2	–	square kilometer
m	–	meter
mm	–	millimeter
m/s^2	–	meter per square second
mg/L	–	milligram per liter
m^2	–	square meter
$\mu g/m^3$	–	microgram per cubic meter
ppm	–	parts per million
$PM_{2.5}$	–	particulate matter 2.5 with diameter of 10 micrometer or less
PM_{10}	–	particulate matter 10 with diameter of 10 micrometer or less

NOTE

In this report, "$" refers to United States dollars.

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EXECUTIVE SUMMARY

A. Introduction

1. To advance the goals of Vision 2041 and to provide support to agricultural education, the Government of Bangladesh (government), through the Secondary and Higher Education Division (SHED) of the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for about $120 million concessional loan and the Economic Development Cooperation Fund (EDCF) of the Export-Import Bank of Korea (Korea Exim bank) for providing about $61.3 million concessional loan to cover the costs of the Strengthening Agricultural Tertiary Education Project (SATEP). SATEP aims to enhance the industry responsiveness of advanced climate-smart agricultural tertiary education and research, and to help the Bangladesh Agricultural University (BAU) in Mymensingh to establish a Bangladesh Instrumentation Center for Climate Change and Agricultural Research (BICAR) to conduct high quality research. Established in 1961, BAU has served the country as a central hub for agricultural higher education and research for the past 62 years.

B. Project Description

2. The project aims to develop BAU as a center of excellence in tertiary agricultural education, build a modern technology-responsive agricultural tertiary education system, create climate-resilient facilities and an enabling environment for innovative research and development, and promote enhanced linkages between academia and agro-industry. These objectives will be achieved through the following four outputs that envision a safe and inclusive learning environment for women.

Output	Description
Output 1: Quality of climate-smart tertiary agricultural education improved.	This output will support BAU to renovate and refurbish existing education facilities such as classrooms and common facilities (e.g., auditorium and sports facilities). This also supports pedagogical training of the academic staff for adopting interdisciplinary and emerging technologies, train laboratory technicians through overseas training, and develop the BAU gender policy.
Output 2: Relevance and entrepreneurial tertiary agricultural education enhanced.	This output will provide seed funding and mentorship support for agricultural startup companies based on competitively selected business plans, provide certificate programs for professionals, establish the Institute of Climate Change and Environment and Institute of Biotechnology (which will be accommodated under a new building for BAU institutes), strengthen engineering and technology faculties, promote university–industry linkage, and strengthen student services for career counseling and alumni networks.
Output 3: Green and climate-resilient agricultural research and development strengthened.	This output will support procurement of goods, furniture, and equipment for seven specialized laboratories at BICAR of BAU for agricultural research and education

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Output	Description
	purposes. [1] The detailed engineering design and construction cost of BICAR will be supported by EDCF. This output will also support competitive research and development grants through the University Grants Commission (UGC).
Output 4: High-technology and climate-smart agricultural university network and project management supported.	This output will support systematic networking with leading national, regional, and international universities and research institutions such as the National Instrumentation Center for Environmental Management at Seoul National University. This output will also support project management, assist BAU in establishing management information system, and organize training for occupational health and safety standards, climate risks, earthquake evacuation and information security based on the disaster management plan and business continuity plan of BAU.

3. The outputs that will involve civil works with potential environmental impacts and risks to occupational and/or community health and safety are limited to Output 1 and Output 3. Under output 1, there will be construction of a new six-story building for the Haor and Char Development Institute (HCDI) and the Interdisciplinary Institute for Food Security (IIFS) as well as the refurbishment of selected 17 existing buildings such as the auditorium and sports facilities. Output 3 will support the detailed engineering design and construction of an eight-story building for BICAR under EDCF financing while ADB will procure the equipment of all the seven laboratories in BICAR. The renovated buildings and the new buildings for HCDI and BICAR will incorporate green building features and will be designed to be resilient to climate change. Construction supervision will be funded by ADB.

C. Implementation Arrangements

4. The SHED of the MOE, acting through the University Grants Commission (UGC), will be the executing agency (EA) while BAU will be the main implementing agency (IA). A project management unit (PMU) will be responsible for overall project management, monitoring, reporting, and coordination during implementation. A project steering committee (PSC) chaired by SHED secretary will be formed, inviting representatives from the private sector and other stakeholders to better reflect the needs of the employers and overall policy guidance. A project implementation committee (PIC) chaired by BAU vice chancellor will also be set up to provide guidance on project implementation. To provide technical support to the PMU and BAU as well as to oversee the environmental compliance of the project to the requirements of ADB and the government, an environment specialist (national consultant) will be engaged prior to the start of construction phase until the occupancy to the new buildings. The environment specialist is expected to be engaged prior to the award of the project contract to assist in evaluating the environmental aspect in the bid documents during the bidding process.

[1] The seven laboratories are (i) imaging laboratory, (ii) climate-smart precision agriculture and modeling laboratory, (iii) analytical laboratory, (iv) post-harvest technology and food processing laboratory, (v) food safety laboratory, (vi) genomics & bioinformatics laboratory, and (vii) diagnostics and vaccines laboratory.

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D. Environmental Requirements

5. The Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 2023 are the main environmental regulations in Bangladesh, which stipulate that no project or industrial unit can be undertaken without obtaining an environmental clearance certificate (ECC) from the Department of Environment (DOE). According to ECR 2023, the DOE has classified various industrial units or projects based on potential adverse impacts to the environment and human health for the purpose of issuing the ECC. This classification includes: (i) green, (ii) yellow, (iii) orange, and (iv) red. The green and yellow categories refer to industries or projects considered to be relatively pollution-free, or with minimal and less significant potential adverse environmental impacts. No environmental assessment will be required for green and yellow categories in the application for ECC. Referring to Schedule 1 of ECR 2023, housing and urbanization project, and residential and commercial building of up to 5,000 square meters (m^2) to 20,000 m^2 built up area, the category is orange. Based on this, the project is anticipated to be orange category as the total footprint is about 12,800 m^2 requiring an initial environmental examination (IEE) in securing for the ECC. ECR 2023 does not categorically indicated on the classification of educational and/or institutional building. This draft IEE will be submitted to the DOE for review to confirm the orange category and to start the ECC application process. However, Rule 13 (6) of ECR 2023 provides that, "If it appears from the initial environmental examination report of an Orange Category industry or project before the Environmental Clearance Committee of the head office of the department that the pollution caused by the concerned industry or project may have a serious impact on the environment and human health, the committee may recommend conducting environmental impact assessment (EIA) for the project and after the approval of the said recommendation by the Director General, the concerned proponent has to conduct the EIA". Even with this provision, SATEP is not expected to cause serious impacts on the environment and human health, thus, DOE may decide for orange category. All other applicable permits will be obtained by the BAU prior to any civil works.

6. The Safeguard Policy Statement (SPS) 2009 of ADB describes the environmental safeguard requirements that apply to all ADB-financed projects and grants. Based on the SPS 2009, projects or grants are screened and categorized based on their potential environmental impacts.

7. Output 1 will involve the construction of a new building for HCDI and IIFS and renovation or refurbishment works for 17 selected academic facilities such as auditorium and sports facilities. Output 3 will also include construction of BICAR for advanced agricultural research. These interventions will have potential environmental impacts that are site-specific, few if any of them are considered irreversible, and mitigation measures can be readily designed. Using the rapid environmental assessment checklist (REA), the project has been classified as category B on environment under SPS 2009, requiring the preparation of an IEE. Based on the requirements of SPS 2009, this IEE is prepared and will be disclosed on the ADB website. Disclosure of the IEE is required by both the SPS 2009 and the ADB's Access to Information Policy (AIP) 2018.

8. The EDCF Safeguard Policy 2016 which was adapted from SPS 2009 and the World Bank, was updated on updated on 1 July 2020. Safeguard Policy 2020 places the compliance responsibility to the borrower and for EDCF to undertake the review of the environmental and social due diligence. The Safeguard Policy 2020 categorizes projects into A, B+, B, and C based on the type of project, location, sensitivity, scale, and potential impacts including the size and nature of the risks. Like ADB, category A is considered high risk on environmental and social impacts requiring an environmental and social impact assessment while category C (low risk) is likely to have minimal or no adverse environmental and social impacts, and thus no environmental

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assessment is required. Based on these categories and those that have been approved by EDCF, SATEP is likely to be category B. Given that the Safeguard Policy 2020 of EDCF is aligned with SPS 2009, the environmental due diligence for SATEP will follow the requirements for category B where an IEE will be the required environmental assessment.

E. Description of the Environment

9. The project site is within the campus of BAU in Mymensingh, approximately 120 kilometers (km) from Dhaka. Established in 1961, BAU occupies a total area of about 486 hectares (ha) and has a total of 44 departments and six faculties. As of 2021, BAU has 567 faculty members and a total of 8,808 students. In addition to the academic community, BAU also operates facilities that provide technical support to farmers and rural communities around the campus. The BAU Research System (BAURES), established in 1984, coordinates and manages the research projects conducted by the faculty while the BAU Extension Center (BAUEC) supports more than 40 agricultural extension services for research and education to 10 major farms for the programs on agronomy, horticulture, genetics and plant breeding, seed pathology center, dairy, sheep, goat, and poultry farms. BAU has a Germplasm Center that takes care of about 161 species.

10. The project site for BICAR will occupy an area of about 4.166 ha while the HCDI and IIFS will occupy an area of about 0.4272 ha. The HCDI and IIFS site is bounded on the north by Karim Baban, one of BAU's oldest buildings, on the south by the Isha Kha Hall, a student dormitory/hall, and the Isha Kha Hall Mosque, on the west by a road connecting to the main BAU campus, and farther east, by a stretch of the Old Brahmaputra River. The site for BICAR is a vacant land with access road and relatively away from other BAU academic buildings.

11. The proposed project area of influence (PAI) covers the project site where the new building for HCDI and IIFS, and the new building for BICAR will be constructed and the study area is extended up to 2-kilometer (km) radius from the project site which includes the BAU campus, part of Mymensingh Pourashava area and the Old Brahmaputra River.

12. Mymensingh falls under the Aw category based on the Köppen climate classification, which is characterized by tropical wet and dry climate resulting in hot and humid summer and dry winter. Climatological data recorded by the Bangladesh Meteorological Department from 1993 to 2022 show that the maximum temperature varies from 28°C to 36°C, with May being the warmest and January the coldest. The average annual rainfall is 2,107 millimeters (mm). The lowest recorded annual rainfall of 975 mm occurred in 2022, while the highest in 1993 at 3,213 mm. The maximum monthly wind speed of 72 km/hour occurred in May 2022. Average monthly sunshine hours vary from 3.72 hours/day in June to 7.29 hours/day in November. According to the seismic zoning map, the site is in Earthquake Zone IV where the seismic intensity is high to medium. Since 1970, there were only five earthquake events recorded in Mymensingh of magnitude above 3 to 4.8. The project site is not prone to flooding and there is no significant evidence of historical seasonal storms or wind hazards.

13. Environmental quality measurements for air quality, noise, water quality, and vibration were conducted on 13–17 November 2022 within the project area. The results show that particulate matter $(PM)_{10}$ and $PM_{2.5}$ exceed the 24-hour averaging limit of the World Bank-International Finance Corporation (WB-IFC) Environmental Health and Safety (EHS) General Guidelines 2007 (WHO Guidelines Global update 2021) at all the eight stations, while noise levels exceed the WB-IFC EHS Guidelines 2007 limits at five stations (out of eight stations), both daytime and nighttime. For water quality, four groundwater samples were tested, three surface water samples within the 1.6 km stretch of the Brahmaputra River near the BAU campus, and two

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sources of drinking water. Results of water quality analysis suggest compliance to the standards of ECR 2023. Dissolved oxygen in Brahmaputra River is above the minimum of 5 mg per liter (mg/L) suggesting that it can sustain aquatic life. All parameters meet the drinking water quality limits except for the presence of total coliform. Heavy metals such as lead, chromium hexavalent, cadmium and arsenic were non-detected.

14. Vegetation at the HCDI and IIFS site is limited to some shrubs, which serve mainly as an open green space used as roaming habitat for some common local birds and domesticated animals. The BICAR location is predominantly grassland. There is no aquatic habitat on both the sites, and there are no species of national or global conservation status.

F. Anticipated Environmental Impacts and Mitigation Measures

15. Screening and scoping of potential environmental impacts of new construction and renovation/refurbishment of existing academic facilities occur primarily during the pre-construction/design and construction stages. These impacts include increased noise and dust levels from site development, vehicle movements, and operation of heavy machinery, waste generation, occupational health and safety risks, community health and safety risks, and the presence of workers and project staff within the BAU sites. Given the proximity of Karim Bhavan, the Isha Khan Halls (East and West) and the Isha Khan Mosque to the project site, the users of these facilities are potentially affected directly. The construction site will be enclosed and properly demarcated to separate student access from workers and project staff. The construction site will be properly lit with clear and visible safety and warning signs. Designated security personnel will ensure that there will be no unauthorized public access. BAU has campus security personnel making sure that there is peace and order within the premises.

16. Associated potential impacts during construction are site-specific, temporary and of short duration, and can be readily mitigated through technical and engineering control measures to meet the applicable government and ADB requirements. To mitigate the potential impacts during construction phase, the contractor will be required to prepare a construction environmental management plan (CEMP), which will outline the contractor's commitments to comply with the mitigation measures and monitoring based on the project environmental management plan (EMP). The CEMP will be subject to approval by the project implementation committee (PIC) and the PMU. The PIC will ensure that the contract complies with the applicable environmental standards set out in the WB-IFC Environmental, Health, and Safety General Guidelines 2007, and ECR 2023, the Air Pollution Control Rules 2022 and the Noise Pollution (Control) Rules 2006. The contractor will be required to have an environmental staff to oversee the implementation of the CEMP, particularly on the community and occupational health and safety, and compliance with the government and ADB requirements.

17. BICAR will have biosafety laboratories - one biosafety level 2 (BSL 2), one biosafety level 3 (BSL 3) in the same building and a biosafety level 2+ in the animal experimentation facility. The Centers for Disease Control and Prevention Biosafety in Microbiological and Biomedical Laboratories (U.S. Department of Health and Human Services 2011) or the Guidelines for Research Involving Recombinant DNA Molecules of the National Institutes of Health 2011, do not recognize BSL 2+ containment level. BSL 2+ refers to describe laboratories where work with microorganisms is conducted in a BSL 2 laboratory with biosafety practices and procedures typically found at BSL 3. Creating a BSL 2+ laboratory means taking a smaller BSL 2 or "tissue culture" laboratory room and dedicating it to the project where limited access is allowed only to those persons who are listed on the research protocol and have received the necessary training.

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18. These biosafety laboratories will be designed following the requirements of the government such as the Bangladesh Biosafety Rules 2012, Biosafety Guidelines of Bangladesh 2020, Biosafety Policy 2020, the Bangladesh National Building Code (BNBC) 2020, and to be aligned with the provisions set forth in the Cartagena Protocol on Biosafety, the World Health Organization, as well as the guidelines of the Korean government in terms of compliance for installation criteria and operating standards recommended by EDCF.

19. Through SATEP, BAU will design and conduct targeted orientation and training program to equip the laboratory staff with the necessary skills, knowledge, and work attitude for managing and monitoring the biosafety laboratories in BICAR. Provision for training includes two batches where each batch covers 30 days for laboratory officers, technicians and maintenance engineers for the operation of BICAR targeting a total of 100 participants. Training will include overseas exposure at the National Instrumentation Center of Environmental Management (NICEM) in Seoul National University (SNU), where BICAR was modeled. The trained staff will develop the capacity of future university and laboratory staff on biosafety.

20. A sustainability cookbook will be developed which will be a comprehensive guide for implementing sustainability initiatives within BICAR outlining specific strategies, best practices, and actionable steps fit to the unique needs and objectives of BICAR. A set of key performance indicators will be identified to track performance of BICAR, identify areas for improvement, and to maintain accountability in achieving sustainability goals. Environmental stewardship will be established in the organizational culture of BICAR, HCDI, and IIFS to guide decision-making processes and operational practices to promote resource use efficiency, reducing waste generation, and minimizing carbon dioxide emissions throughout the activities of the research laboratories. Sustainable farming practices within the research facility will be implemented and environmental assessments will be incorporated into research projects, and to promote biodiversity conservation and ecosystem resilience through research initiatives.

21. Potential environmental implications of equipment procurement for the seven laboratories in BICAR were assessed to ensure that there will be no risks. Equipment selection was made based on the academic staff research requirements in each department, research objectives followed by the workflow and the services required. Given the wide range of research and academic activities involved, training and capacity building of both academic and technical staff is crucial to the efficient and sustainable operation of BICAR. The use of UAV and drones for the climate-smart precision agriculture and modeling laboratory will comply with the regulations of the Civil Aviation Authority of Bangladesh on its registration, licensing, flight authorization process, etc., and BAU will ensure compliance.

22. Green building features will be incorporated in the design of the new buildings to maximize the available natural light, climatic conditions of Mymensingh, and to reduce energy and water requirements. Solar rooftop photovoltaic (PV) systems will be installed. A conservative estimate of the solar power that can be generated from the new buildings will be 925 megawatt-hour (MWh) per year. Procurement will consider the available Energy Star-certified products. Applicable codes and standards such as wind and seismic loads from the BNBC 2020 will be followed and reference will be made to organizations such as the American Society of Civil Engineers, US Green Building Council, and the IFC's Excellence in Design for Greater Efficiencies (EDGE).

23. Operations of BICAR will generate biological waste. Autoclaving (steam sterilization) will be the main decontamination method. An efficient and properly operating autoclave will render biohazardous waste sterile so that it can be disposed of safely through the municipal waste. The three expert committees formed by BAU and supported by consultant will prepare and finalize the

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BICAR laboratory biosafety manual prior to its operation outlining the procedures for autoclaving biohazardous waste, handling of sharps, solid infectious waste, waste labeling, training required, safety and emergency procedures, roles and responsibilities, monitoring and performance indicators, record keeping and reporting, waste disposal and handling of noninfectious and general waste. Aside from the biosafety manual, BAU will also prepare a biosecurity plan which will include the measures to be implemented to prevent the theft, misuse and intentional release of hazardous biological agents. The plan will cover personnel security, information control and physical security of the facility, including access.

G. Analysis of Alternatives

24. Three alternative sites were considered for the location of BICAR using the criteria – land type, road connectivity, existing environmental condition, and distance from the major proposed faculties. No alternative site was considered for the location of HCDI and IIFS as the proposed site was viewed as the best option in terms of ownership, adequate area, and availability.

25. The “no project” or “business-as-usual” option will result in the available sites within the BAU campus not being the best and highest usage of land. Without the project, the students, faculty, and staff of BAU will not have the opportunity to experience the improvements in the existing buildings through renovations and the benefits of having new buildings for IIFS and the HCDI as well as a premier research facility from BICAR.

26. The “with project” option includes improvement of tertiary agricultural education through advanced agricultural R&D, state-of-the-art equipment and facilities, training, and networking, revision of curricula to make them industry responsive and climate smart.

H. Information Disclosure, Consultation, and Participation

27. Due to coronavirus disease (COVID-19), consultations were conducted through a virtual meeting on 13 July 2020 with 20 participants, an online perception survey through the BAU website in August 2020 with 57 respondents, a face-to-face meeting on 20 December 2022 with 103 participants, and an online survey on disaster management from 10–30 November 2023 with 987 respondents. Issues raised were mainly during the construction stage and included potential increases in dust and noise levels, waste generation, movement of workers and vehicles, traffic congestion, accidents, and social conflicts between local and migrant workers. Other concerns included transparency in selection process for grants and training, project implementation in terms of funds utilization, and lack of training and drills on safety and emergencies.

28. Consultations will continue during project implementation and the PMU will ensure that all the means of communication with stakeholders will include a way to provide comments and suggestions. To achieve this, the PMU office will include an information desk, and an information disclosure program has been prepared for the project.

I. Grievance Redress Mechanism

29. The PMU will establish a GRM based on the SPS 2009 requirements with the following key steps:

(i) Assign a focal person with contact details to manage the GRM;

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(ii) Information on the focal person, procedures (or flowchart) for filing a complaint, and the complaint form will be made publicly available through the project website and billboards at the construction site(s);
(iii) Create a grievance redress committee (GRC) to resolve the complaints, and its members will ensure representation of women and/or members from indigenous peoples' community (if any);
(iv) Summary of recorded complaints received and resolved will be included in the environmental monitoring report submitted to ADB semi-annually during construction phase and annually post-construction phase;
(v) Complainants can seek redress through the DOE (as mandated by the Environment Court Act 2000, amended in 2002 and 2010) of the Bangladesh legal system at any point in the GRM process; and,
(vi) If efforts to resolve the grievance through the GRM and the concerned ADB operations department fail and the complainant is still dissatisfied, he/she may resort to ADB's Accountability Mechanism.

30. There are three levels of grievance redress – (i) through the PMU or through the Site Engineer of the Contractor, (ii) through the GRC, and (iii) through the DOE under the provisions of the Environment Court Act 2000 (as amended in 2002 and 2010) or the appropriate courts. Access to the legal system by the DOE and appropriate courts is not restricted at any stage of the GRM.

J. Environmental Management Plan

31. The EMP provides a summary of the potential environmental impacts, mitigation measures for the identified impacts, and monitoring activities required during the different project stages─ pre-construction and design, construction, post-construction, and decommissioning. The EMP also describes the implementation arrangements, roles and responsibilities, and capacity development to ensure that the potential adverse impacts of the project are minimized. An integral part of the EMP is the environmental monitoring plan (EMOP), which describes the environmental quality parameters to be monitored (both qualitatively and quantitatively) during project implementation. Monitoring results will be referred to ECR 2023 as well as international best practices outlined in the WB-IFC EHS General Guidelines 2007 and other organizations that promote occupational and environmental health such as WHO, Occupational Safety and Health Administration (OSHA), American Conference of Governmental Industrial Hygienists (ACGIH), and others. The EMP will be included in all bidding and contract documents, and contractors will be informed of their obligations to implement the EMP, and to include the EMP-related costs in their bids.

32. Once the designs of the new buildings, including the scope of renovation/refurbishment works, are finalized, this IEE and the EMP will be revised and updated to reflect the changes. The updated IEE will be reviewed by ADB and posted on their website. Once the project becomes effective, the PMU will prepare environmental monitoring reports (EMRs) to be submitted to ADB semi-annually during construction and annually during post-construction. The EMRs will be posted on the ADB website in accordance with the requirements of SPS 2009 and AIP 2018. The PMU will be supported by an environment specialist (national consultant) to monitor compliance to the requirements of the government and ADB.

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K. Conclusion and Recommendation

33. Due diligence for the project was conducted based on the requirements of SPS 2009. The Safeguard Policy 2020 of EDCF was also referred to as well as the national requirements under the ECR 2023. According to SPS 2009, the project is environment category B requiring an IEE. Referring to Schedule 1 of ECR 2023, it is anticipated that the project is category orange as the total footprint of the new buildings is about 12,800 m^2. Category orange project requires an IEE for securing the LCC and the ECC from the DOE. Given that the Safeguard Policy 2020 of EDCF is adapted from the World Bank and SPS 2009, the project will also be category B.

34. The scope of the environmental assessment covers the project cycle of design/pre-construction, construction, post-construction, and decommissioning. Identified adverse environmental impacts will have corresponding mitigation measures included in the EMP, and environmental monitoring activities will be carried out during project implementation guided by the EMOP.

35. The IEE has identified that adverse environmental impacts are mainly associated with the construction of the new buildings, and the renovation of 17 selected existing buildings. These impacts are short-term, temporary, reversible, and can be readily mitigated through best practices in engineering, construction, and project management, as well as compliance to occupational and environment health and safety standards of the government and international best practices from the WB-IFC EHS General Guidelines 2007.

36. Beneficial impacts include job creation, opportunities for local businesses, professional development for BAU faculty, students and staff through training and R&D projects, and the use of new facilities equipped with advanced instrumentation and resources.

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I. INTRODUCTION

1. Building on Vision 2021, the Government of Bangladesh adopted the Vision 2041 moving the country into a development path where the goal is to end extreme poverty and to achieve the upper middle-income country status by 2031, and to reach the high-income country status by 2041.[1] To realize this transition, it will demand a process of rapid inclusive growth to increase productive capacity, building an innovative knowledge economy, and protecting the environment.

2. In Vision 2041, the government underscores nine strategic goals which include a knowledge-based society where education plays an instrumental role, and paradigm shifts in agriculture to enhance productivity and to ensure the future nutrition and food security.[2,3]

3. The agriculture sector employs 45.4% of the labor force in 2022 and shares about 11% in the gross domestic product (GDP).[4] Women represents 26.2% of the labor force in the agriculture sector. Given this, the government recognizes the significant contribution of agriculture in the economy of Bangladesh and its crucial role as key drivers toward achieving the goals of Vision 2041.

4. However, agricultural production is highly dependent on weather and climate, and Bangladesh is one of the most vulnerable countries in the world both to disasters and climate change. According to the Global Climate Risk Index 2021, Bangladesh is 7th extreme disaster risk-prone country in the world.[5] While the government has implemented climate change adaptation and mitigation projects, research projects including agriculture-specific adaptation measures such as salinity and drought-tolerant crops, the agriculture sector remains vulnerable without urgent action on financing and collaborative support from other sectors to address climate change.[6] Agricultural education is an important support to enhance agricultural productivity and in building climate change resilient agricultural technology systems. Facilitating knowledge application in agriculture is one of the core tenets of the National Education Policy 2010.[7] The Perspective Plan of Bangladesh (2021–2041), Vision 2041, and the 8th Five Year Plan July 2020 to June 2025 identify food security as a crucial goal with commitment from the government to encourage research and development in the agricultural sector.

5. To advance the goals of these government initiatives and to provide support to agriculture education, the government, through the SHED of the MOE, requested the ADB with a $120 million concessional loan and the EDCF of KEXIM with a $61.3 million concessional loan to cover the costs of SATEP which aims to enhance industry responsiveness of advanced climate-smart agricultural tertiary education and research. Also, the project will help the BAU in Mymensingh to establish BICAR to conduct high quality research. Established in 1961, BAU has served as the central hub for higher agricultural education and research in Bangladesh for the last 62 years.

A. Overview of the Project

6. The project aims to develop BAU as a center of excellence on agricultural tertiary education, build a modern technology-responsive agricultural tertiary education system, create

1 FAOLEX Database. *Perspective Plan of Bangladesh 2021–2041*.
2 Planning Commission. 2020. *Perspective Plan of Bangladesh 2021–2041: Making Vision 2041 a Reality*.
3 JICA. 2023. *JICA Country Analysis Paper for The People's Republic of Bangladesh*.
4 Bangladesh Bureau of Statistics. 2023. *Labour Force Survey 2022*.
5 UNDP. Bangladesh. 2023. *Climate Vulnerability Index* (Draft).
6 MOEFCC. Bangladesh. 2022. Climate Change Initiatives of Bangladesh.
7 Ministry of Education. 2010. National Education Policy 2010.

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facilities and enabling environment for innovative research and development and promote enhanced linkages between academia and agro-industry. SATEP is expected to be implemented until June 2029.[8] Table 1.1 briefly describes the four project outputs while **Error! Reference source not found.**.1 presents the project location.

Table I.1: Project Outputs

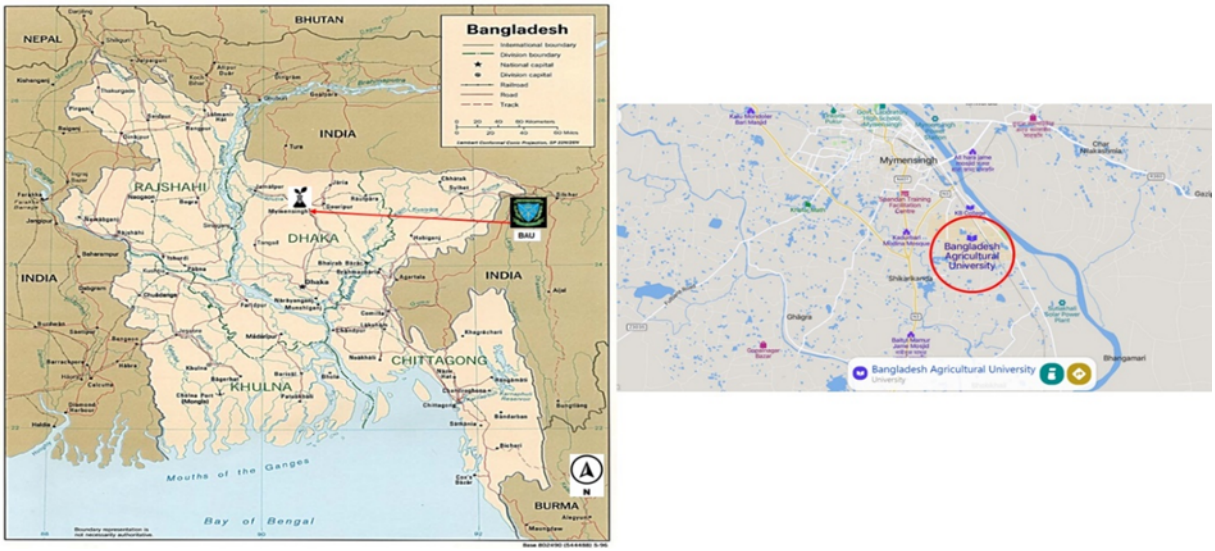
Output	Description
Output 1: Quality of climate-smart tertiary agricultural education improved.	This output will support BAU to renovate and refurbish existing education facilities such as classrooms and common facilities (e.g., auditorium and sports facilities). This also supports pedagogical training of the academic staff for adopting interdisciplinary and emerging technologies, train laboratory technicians through overseas training, and develop the BAU gender policy.
Output 2: Relevance and entrepreneurial tertiary agricultural education enhanced.	This output will provide seed funding and mentorship support for agricultural startup companies based on competitively selected business plans, provide certificate programs for professionals, establish the Institute of Climate Change and Environment and Institute of Biotechnology (which will be accommodated under a new six-story building for BAU institutes), strengthen engineering and technology faculties, promote university–industry linkage, and strengthen student services for career counseling and alumni networks.
Output 3: Green and climate-resilient agricultural research and development strengthened.	This output will support procurement of goods, furniture, and equipment for seven specialized laboratories at BICAR of BAU for agricultural research and education purposes. [9] The detailed engineering design and construction cost of BICAR will be supported by EDCF. This output will also support competitive R&D grants through the UGC.
Output 4: High-technology and climate-smart agricultural university network and project management supported.	This output will support systematic networking with leading national, regional, and international universities and research institutions such as the National Instrumentation Center for Environmental Management (NICEM) at Seoul National University (SNU). This output will also support project management, assist BAU in establishing management information system, and organize training for occupational health and safety standards, climate risks, earthquake evacuation and information security based on the disaster management plan and business continuity plan of BAU.

[8] BAU Development Project Proposal May 2024.

[9] The seven laboratories are (i) imaging laboratory, (ii) climate-smart precision agriculture and modeling laboratory, (iii) analytical laboratory, (iv) post-harvest technology and food processing laboratory, (v) food safety laboratory, (vi) genomics & bioinformatics laboratory and (vii) diagnostics and vaccines laboratory.

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Figure I.1: Project Location Map



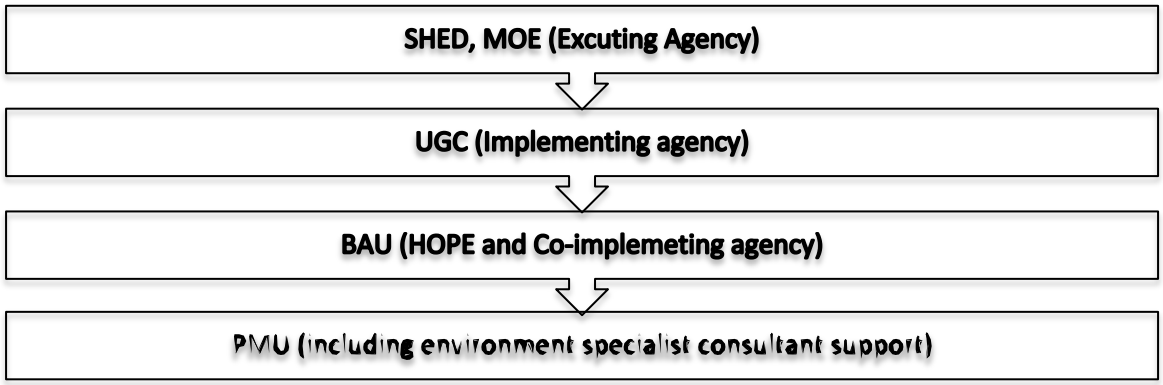
B. Project Implementation Arrangements

7. SHED of MOE, acting through the UGC will be the EA while BAU will be the main IA. The PMU at the BAU will be responsible for overall project management. A PSC will be formed and will invite representatives from the private sector and other stakeholders to better align with the needs of the employers. shows the project management structure.

8. To provide technical support to the PMU and BAU as well as to oversee the environmental compliance of the project to the requirements of ADB and the government, an environment specialist (national consultant) will be engaged by PMU prior to the start of construction phase until the occupancy to the new buildings when the Chief Executive Officer of the Mymensingh City Corporation has issued the occupancy certificate required under the BNBC 2020. The environment specialist is expected to be engaged prior to the award of project contract to assist in evaluating the environmental aspect in the bid documents during the bidding process. The environment specialist will closely work with Project Director, Deputy Project Director (Civil Work), and Assistant Project Director (Civil Work) at PMU.

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Figure I.1: Project Management Structure



C. Need for Environmental Assessment

9. **Requirements of the Government.** ECA 1995 and the ECR 2023 are the main environmental regulations in Bangladesh, which provide that no project or industrial unit can be undertaken without securing an ECC from the DOE. The DOE is the government agency that regulates and enforces environmental management regulations to ensure that development projects are implemented sustainably, and to conserve and manage the environment in Bangladesh.

10. The new ECR 2023 categorizes project based on potential impacts to the environment and human health. The new categories are green (low or minimal impacts), yellow (moderate impacts), orange (significant impacts), and red (strong impacts and must mitigate to reduce impacts by protecting the environment through pollution control measures). Under Rule 5 of ECR 2023, LCC needs to be secured first for yellow, orange, and red categories prior to obtaining the ECC from the Director, DOE. The green category does not require LCC. As part of securing the ECC, the orange category requires an IEE while the red category requires an EIA. Yellow and green categories do not require environmental assessments.

11. Referring to Schedule 1 of ECR 2023, housing and urbanization project, and residential and commercial building of up to 5,000 square meters (m^2) to 20,000 m^2 built up area, the project category is orange.[10] The total footprint of the new buildings is about 12,800 m^2, thus, it is anticipated that the project will be category orange based on similar nature of projects listed in Schedule 1 of ECR 2023 (i.e., housing and urbanization, residential and commercial building) as educational and/or institutional buildings are not categorically listed as such. For a category orange project, a LCC and an ECC from the DOE will be required. This draft IEE will be submitted to the DOE for review and confirmation of the orange category. Any gaps will be completed and BAU is expected to apply for LCC and ECC. The ECC is renewed annually. However, if relevant authority considers that this project should be classified as red category, the project will follow Rule 13 (6) of ECR, 2023 - "If it appears from the initial environmental examination report of an Orange Category industry or project environmental Clearance Committee of the head office of the department that the pollution caused by the concerned industry or project may have a serious impact on the environment and human health, the committee may recommend conducting

[10] ECR 2023, Schedule 1, Indicative list of projects/industrial establishment under four categories of environmental impacts.

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environmental impact assessment (EIA) for the project and after the approval of the said recommendation by the Director General, the concerned proponent has to conduct the EIA".

12. **Requirements of ADB.** SPS 2009 sets out the requirements for environmental safeguard that apply to all the projects and grants ADB finances.[11] SPS 2009 requires that projects to be funded by ADB will be subject to screening and categorization based on their potential environmental impacts. The categorization determines the required environmental assessment and projects are assigned to one of the four categories: **A** requires an EIA (*likely to have significant adverse environmental impacts that are irreversible, diverse or unprecedented, may affect area larger* than *the sites or facilities subject to physical works*), **B** requires an IEE (*potential environmental impacts are less adverse than those of category A, 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*), and **C** does not require environmental assessment but environmental implications need to be reviewed (*likely to have minimal or no adverse environmental impacts*). Category **FI** involves investment of ADB funds to or through a financial intermediary (FI). Under FI's investment that will have minimal or no adverse environmental and social risks, the FI project will be treated as category C. All other FIs will be required to establish or have in place an environmental and social management system that is commensurate to the nature and risks of the FI's likely portfolio.

13. From Table 1.1, the project intervention that will involve civil works are in output 1 and output 3. Output 1 includes a new six-story building for the Haor and Char Development Institute (HCDI), and the Interdisciplinary Institute for Food Safety (IIFS) and renovation works for the 17 selected existing facilities such as the classroom, library, auditorium and sports facilities. Renovation works will include women- and disability-friendly facilities (e.g., separate toilets, separate prayer rooms, study and rest areas, childcare facility, and easy access for people with disability for all faculties). Output 3 includes construction of an eight-story building for BICAR funded by EDCF. The construction supervision of all civil works of this project at BAU is funded by ADB.

14. An REA checklist was used to determine the potential environmental impacts of the project. Project sites are within the existing campus of BAU and given the associated civil works that will be involved in the construction of the new buildings and the scope of renovations, the project is classified as category B on environment based on SPS 2009 requiring an IEE. Category B project is considered because the proposed project is likely to have adverse environmental impacts that are less adverse, site-specific, few if any of them irreversible, and in most cases mitigation measures can be more readily designed. Thus, this IEE is prepared based on the requirements of SPS 2009.

15. **Requirements of Export-Import Bank of Korea.** EDCF has developed their Safeguard Policy 2016 with principles, standards, and procedures adapted from the SPS 2009 and the World Bank in terms of project screening and categorization, environmental and social impact assessment, information disclosure, monitoring and reporting, grievance redress mechanism, stakeholders' consultation and participation, and accountability mechanism.[12] Safeguard Policy 2016 was updated on 1 July 2020. These safeguards place the compliance responsibility to the borrower and for EDCF to undertake the review of the environmental and social due diligence.

[11] ADB. 2009. *Safeguard Policy Statement 2009*.
[12] EDCF. 2016. Safeguard Policy. and EDCF. 2012. EDCF Issue Paper Vol. 1 No.2. EDCF Safeguard revision direction and future tasks.

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16. At the initial stages of project preparation, the borrower shall complete a screening form for categorization to be submitted to KEXIM as early as possible. Safeguard Policy 2020 categorizes projects into A, B+, B, and C based on the type of project, location, sensitivity, scale, and potential impacts including the size and nature of the risks. Category A is considered high risk on environmental and social impacts requiring an environmental and social impact assessment (ESIA). Category B+ is substantial risk but is less adverse than category A where the impacts and risks can be managed and predicted consistent with the EDCF Safeguard Policy, and this also requires an ESIA. Category B is moderate risk where the environmental and social impacts are less adverse than category B+, site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than those of category B+. Category B requires an initial environmental and social examination (IESE). Category C (low risk) is likely to have minimal or no adverse environmental and social impacts, and thus no ESIA or IESE is required. Based on these categories and those that have been approved by EDCF,[13] this project is likely category B.

17. Given that Safeguard Policy 2020 of EDCF is aligned with SPS 2009, the environmental due diligence for this project will follow the requirements of SPS 2009.

D. IEE Methodology

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

19. **Scope.** Following the requirements of SPS 2009 for an environment category B project, this IEE was prepared where the scope covers the general existing environmental profile of the project site, assessment of potential environmental impacts during design and/or pre-construction, construction, and operation (or post-construction), and decommissioning stages; and a description of the environmental management plan (EMP) and environmental monitoring plan (EMOP). While most COVID-19 restrictions have been lifted, given the risk that another viral threat may arise with similar impacts, and to minimize the spread in case the same will occur during project implementation, preventive measures will be considered as standard practice in projects that will involve construction. Steps undertaken are as follows:

(i) Carry out site visits to collect relevant secondary data to establish the baseline environmental condition;
(ii) Conduct environmental quality measurements on air, noise, water, and vibration;
(iii) Assess the potential impacts due to location, design, construction, and post-construction of the new buildings including the renovation works for existing educational facilities such as the classroom, library, auditorium and sports facilities;
(iv) Review the scope of renovations of the classroom, library, auditorium and sports facilities, and other selected existing buildings, prepare audit checklist, and assess the potential impacts;
(v) Examine opportunities for environmental enhancement and identify measures;

[13] EDCF Safeguard Policy. Information Disclosure.

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(vi) Prepare an EMP outlining the measures to mitigate potential environmental impacts including the institutional arrangements;
(vii) Identify key environmental parameters required to be monitored during project implementation and prepare an EMOP;
(viii) Carry out consultation with affected stakeholders, local administrative bodies to identify perceptions of the project and introduce project components and anticipated impacts; and,
(ix) Disclose the draft IEE on ADB website and prepare project brief and/or frequently asked questions in Bangla that can be publicly available at the offices of SHED, UGC, BAU and at the project construction site office.

E. Structure of the Report

20. Based on the Annex to Appendix 1 of SPS 2009, the IEE report has the following contents:

- *Executive Summary* This section briefly describes the critical facts, significant findings, and recommended actions.

- Section 1 *Introduction* Describes the overview of the project, environmental requirements, objectives and scope of the study, approach, and methodology.

- Section 2 *Policy, Legal, and Administrative Framework* Discusses the national legal and institutional framework within which the environmental assessment is carried out including the requirements of ADB outlined in SPS 2009. Also identifies project-relevant international environmental agreements to which the Government of Bangladesh is a party or signatory, and other relevant regulations, plans, and policies.

- Section 3 *Description of the Project* Provides an overview of the proposed project; its objectives and major components including maps showing the project's location, and implementation arrangements.

- Section 4 *Description of the Environment* Describes the relevant physical, biological, and socioeconomic conditions within Mymensingh and specifically, the area of influence within 2-km radius from the BAU.

- Section 5 *Anticipated Environmental Impacts and Mitigation Measures* Provides an assessment of the potential environmental impacts associated with the construction of the new buildings including the renovation of selected existing buildings such as the classroom, library, auditorium and sports facilities. Corresponding mitigation measures are included for the identified potential adverse environmental impacts. The environmental impacts and mitigation measures including the required environmental monitoring are summarized in the EMP and the EMOP.

- Section 6 *Analysis of Alternatives* Examines the alternatives to the proposed project sites to ensure avoidance of significant adverse environmental impacts.

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- Section 7 *Information Disclosure, Consultation, and Participation* Describes the process of engaging stakeholders and information disclosure. This section summarizes the comments and concerns of stakeholders consulted.

- Section 8 *Grievance Redress Mechanism* This section describes the grievance redress framework for lodging complaints from affected stakeholders and the process of complaints resolution.

- Section 9 *Environmental Management Plan* Describes the set of mitigation and management measures to be taken for the identified potential environmental impacts during project design, construction, and post-construction. This section also includes monitoring and reporting procedures as well as institutional implementation arrangements.

- Section 10 *Conclusion and Recommendation*

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II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Environmental Requirements of Bangladesh

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

22. **Environmental Agency.** The Ministry of Environment, Forest, and Climate Change (MOEFCC) is the agency responsible for planning, promoting, coordinating, and overseeing the implementation of programs and plans on environment and forestry. All the national environmental matters are managed by the MOEFCC and is also responsible for activities such as prevention and control of pollution, forestation and regeneration of degraded areas and the protection of the environment as well as the framework of legislations. As needed, the MOEFCC also conducts surveys, impact assessments, pollution control, research, collection, and dissemination of environmental information, and in creating environmental awareness among all sectors in Bangladesh.

23. The regulatory functions of the MOEFCC are implemented by the DOE which was created in 1989 and is headed by a Director General. The DOE regulates and enforces environmental management regulations to ensure sustainable development and to conserve and manage the environment. As well, the DOE ensures the consistent application and compliance of environmental rules and regulations; and provides guidance and training, and promotional campaigns on improving the awareness of environmental issues.

24. **Environmental Regulations.** The Environment Conservation Act (ECA) 1995 (as amended 2000, 2002, 2007 and 2010) and the Environment Conservation Rules (ECR) 1997 (as amended 2023) are the key environmental regulations in Bangladesh.

25. ECA 1995 provides for the conservation of the environment, improvement of environmental standards and control, and mitigation of environmental pollution. According to Section 12 of the ECA 1995, “no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate (ECC) from the Director General.” Thus, ECA 1995 mandates the DOE to undertake any activity needed to conserve and enhance the quality of environment, and to control, prevent and mitigate pollution.

26. ECR 1997 was formulated in accordance with Section 20 of ECA 1995 to ensure sustainable development and to prevent the environmental degradation in Bangladesh. ECR 1997 regulates the activities that may cause adverse human and environmental impacts through the declaration of ecologically critical areas, categorization of industries and projects, and identification of the type of environmental assessments needed against respective categories of industries or projects. Among other things, these rules set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc.; (ii) the requirement for and procedures to obtain ECC; and (iii) the requirements for the IEE based on categories of industrial and other development interventions.

27. On 5 March 2023, the government passed the ECR 2023 to strengthen the requirements and to streamline procedures in securing environmental permits as well as the implementation of the environmental standards, and categorization of projects or activities repealing the previous ECR 1997. The ECR 2023 specifies the categorization of projects or industrial establishments based on location and potential adverse environmental and human health impacts. The new

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categories are green, yellow, orange and red. Green category has low impact to the environment and human health; yellow category has moderate impact; orange category will be institutions or projects that have significant impacts while the red category has a strong impact and must mitigate the environmental impacts by protecting the environment and by employing pollution control measures. Orange category requires an IEE while the red category will require a more in-depth EIA. However, Rule 13 (6) of ECR 2023 provides that, "If it appears from the initial environmental examination report of an Orange Category industry or project before the Environmental Clearance Committee of the head office of the department that the pollution caused by the concerned industry or project may have a serious impact on the environment and human health, the committee may recommend conducting environmental impact assessment (EIA) for the project and after the approval of the said recommendation by the Director General, the concerned proponent has to conduct the EIA". Schedule 1 of ECR 2023 gives the indicative list of projects/industrial establishment under the four categories of environmental impacts.

28. The ECR 2023 also provides for access to information, stakeholders' engagement in the EIA process, compliance monitoring of the conditions set out in the ECC, guidelines on location setting of industrial establishments or projects, guidelines for the terms of reference (TOR) of the EIA and report preparation, establishment and operation of industrial effluent treatment, setting qualifications of consultants for the EIA, indicative buffer distance between the project or industry and sensitive areas, and the updated environmental standards for water quality and sewerage.

29. The ECA 1995 and the new ECR 2023 delineate the environmental regulatory mechanism to protect the environment and human health in Bangladesh. Aside from ECA 1995 and ECR 2023, Table II.1 lists a summary of relevant environmental regulations.

Table II.1: Relevant Environmental Regulations, Policies and Plans

Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
Bangladesh National Building Code 2020	Ministry of Housing and Public Works	This regulation sets minimum standards for design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings to safeguard, within achievable limits, life, limb, health, property, and public welfare.	Design and construction of the new buildings (i.e., IIFS and HCDI, BICAR) and the renovation of selected existing buildings such as the classroom, library, auditorium and sports facilities will comply with the appropriate codes. Occupancy certificate for the new buildings will be issued by the Chief Executive Officer of Mymensingh City Corporation.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
The Infectious Diseases (Prevention, Control and Eradication) Act 2018	Ministry of Health and Family Welfare	Entered into force on 14 November 2018, this Act was designed to protect the people from national and global spread of infectious diseases, raise awareness of such diseases, prevent, control, and eradicate infectious or communicable diseases, and to address public health emergencies and to reduce health risks.	Construction and post-construction of new buildings and building renovations will involve workers and BAU staff. Relevant provisions from the Act will be adhered to.
Bangladesh Building Construction Rules 2008	Ministry of Housing and Public Works	Controls development by imposing conditions on setbacks, site coverage, construction of garages, access to plot, provision of lift, land use of that particular plot and height of building.	Design and construction of new buildings will refer and comply to the rules.
Fire Prevention and Extinguishing Act, 2003 (Act No. 7 of 2003)	Bangladesh Fire Service & Civil Defence, Ministry of Home Affairs	Provides for the prevention and extinguishing of fire and rescue operations	Design and construction of the new buildings and buildings for renovation will ensure compliance to the provisions of this Act.
Bangladesh Fire Safety Rules 2003	Bangladesh Fire Service & Civil Defence, Ministry of Home Affairs	Set of regulations established to ensure fire safety in various types of buildings and establishments to prevent and control fire hazards, protect lives, and minimize property damage caused by fire incidents.	Design and construction of the new buildings and buildings for renovation will incorporate the appropriate provisions set by these rules.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
National Plan for Disaster Management (2021-2025) 2020	Ministry of Disaster Management and Relief (MDMR)	Guide the implementation of disaster management consistent with the government's vision, mission, and national and international approaches on disaster risk management.	Helps BAU to improve resilience, effective planning, and implementation of disaster preparedness and response capacity.
Disaster Management Act 2012	MDMR	Coordinate activities on disaster management, making them object-oriented and strengthened, and to formulate rules to build up infrastructures of effective disaster management and resiliency to all types of disaster.	Guides the design and operation of new buildings, buildings for renovation, and BAU operations and emergency procedures
Environment Court Act 2000 (amended in 2002 and 2010)	MOEFCC	Ensure the resolution of disputes on environmental and social damages resulting from any development activity. This Act also allows for the completion of environment-related legal proceedings.	Provide a mechanism for affected persons to seek remedy from the courts of environmental issues.
Road Transportation Act 2018 and the Motor Vehicles Ordinance 1983	Bangladesh Road Transport Authority	This Act provides road transport security for any violations of the Motor Vehicle Ordinance Act of 1983. Regulates vehicle licenses, types of offenses and fines for traffic violations.	All transport vehicles under this project will comply with the relevant provisions.
Bangladesh Factories Act 1995	Department of Labor, Ministry of	Require every workplace including small- or large-scale	BAU, their contractors and subcontractors

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
	Labor and Employment	construction where women are employed to have an arrangement of childcare services. As mandated by this Act and the Labor Laws, medical facilities, first aid and accident and emergency arrangements are to be provided by the authorities to the workers at workplaces.	under this project will comply with the provisions set forth by this Act.
Bangladesh Labor Law 2006 (amended 2018)	Department of Labor, Ministry of Labor and Employment	Cover the working conditions of services and employment, youth employment, benefits including maternal benefits, compensation for injuries, trade unions and industrial relations, disputes, participation of workers in company's profits, regulation of safety of workers, penalty procedures, administration and inspection.	BAU, their contractors and subcontractors under this project will comply with the provisions set forth by this Act.
Bangladesh Labor Rules 2015	Department of Labor, Ministry of Labor and Employment	Provide the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions, including the prohibition of child labor and adolescent labor.	BAU, their contractors and subcontractors under this project will comply with the requirements of the labor rules.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
National Policy on Occupational Health and Safety 2013	Department of Labor, Ministry of Labor and Employment	Adopted on 5 November 2013, this policy ensures the safety of workers and applies to all workplaces in Bangladesh including formal and informal sectors of industries, factories, enterprises, businesses and commercial entities and farms and help increase industrial productivity.	Specific requirements on occupational health and safety will be incorporated in the CEMP by the contractors and in their subcontractors (if any).
National Environmental Policy 2018	MOEFCC	Ensure environmental protection and sustainable consumption and production of resources through approaches such as Polluter-Pays Principle, promotion of cleaner production technologies, Clean Development Mechanism, etc.	Will incorporate relevant provisions to the extent possible in the design, procurement, construction, and post-construction of new buildings and buildings for renovation.
Solid Waste Management Rules 2021	MOEFCC	Require (i) source segregation of waste, (ii) standards for composting, (iii) anaerobic digestion and waste-to-energy projects, (iv) guidelines for landfilling, and (v) standards for the placement of secondary storage bins, and primary and secondary collection of waste.	Generation and management of waste from the design, construction, and post-construction will comply with the requirements of these rules.
Hazardous Waste (e-waste) Management Rules 2021	MOEFCC	Applies to persons or organizations in manufacture,	Generation and management of hazardous waste

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		marketing, purchase, sale, import, export, storage, stocking for research in laboratories, disposal, repair, processing, and transportation or all related activities in electrical and electronic products.	during design, construction, and post-construction will comply with the requirements of these rules.
Air Pollution Control Rules, 2022	MOEFCC	Air quality standards based on WHO Guidelines; emissions limits and technical specifications for key sectors; mandates and coordination mechanisms among relevant line ministries to control both household and outdoor air pollution.	Relevant provisions under these rules will be complied by the BAU, their contractors and subcontractors particularly during construction and operation.
Noise Pollution (Control) Rules 2006	MOEFCC	Sets the sound levels according to zones (i.e., residential, commercial, silent, etc.) to protect human health.	Noise-generating activities under this project will comply to the limits set by the rules.
National Solar Energy Roadmap (2021-2041)	Sustainable and Renewable Energy Development Authority (SREDA), Power Division Ministry of Power, Energy and Mineral Resources	Propose component and decade-wise solar photovoltaic (PV) capacity targets until 2041 which aims to increase the share of renewable energy in the national energy mix; ensure energy security and sustainability; reducing the greenhouse gas (GHG) emissions; and attracting private sector investment in	Installation of solar rooftop PV panels will contribute to energy supply for BAU.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		renewable energy projects.	
Net Metering Guidelines 2018	Power Division, Ministry of Power, Energy, and Mineral Resources	Provides guidance in motivating consumers to install solar PV systems on rooftops, integrate with the main grid and become active prosumers (i.e., consumer who also produces electricity). From 10 kW up to 3 MW may be exported to the grid.	Solar rooftop PV systems to be installed in the new buildings will refer to these guidelines.
Renewable Energy Policy 2008	SREDA, Power Division, Ministry of Power, Energy, and Mineral Resources	Aim to encourage the use of renewable energy and investment in renewable energy projects, and thus, outlines the target to meet 5% of the total power demand from renewable energy sources by 2015 and 10% by 2020. Policy also provides guidance on institutional arrangements, resource, technology and program development, investment and fiscal incentives and the regulatory policy.	Installation of solar rooftop panels is expected to increase renewable energy generation and utilization consistent with the policy.
Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	MOEFCC	Action Plan was built on six pillars to adapt to climate change and safeguard the future well-being of the people. The six pillars include food security, social protection, and health;	Design and construction will incorporate green building features, energy, and water efficiency as well as procurement of Energy Star-labeled products. Energy Star label was

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening. Updated BCCSAP includes new thematic areas - natural resources management, gender, and urban dimension of climate change.	established and administered by the US Environmental Protection Agency to reduce GHG emissions and other pollutants caused by the inefficient use of energy; and to make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort.
Mujib Climate Prosperity Plan Decade 2030	Ministry of Planning	Nation's climate resilience strategy that envisions accelerated implementation of the Paris Agreement and co-benefits from long-term low GHG emissions.	Incorporating green building features, installation of solar rooftop PV panels, and procurement and use of energy-efficient products will contribute to the goals of the Plan.
Bangladesh Delta Plan (BDP) 2100	Bangladesh Planning Commission	Envisioned as a long-term integrated and holistic plan that takes a long-term view on water resource management, climate change and environmental challenges with a view to supporting long-term development of Bangladesh.	Incorporating green building features, installation of solar rooftop PV panels, and procurement and use of energy-efficient products will contribute to the goals of the Plan.
Bangladesh Biosafety Rules 2012	MOEFCC	Regulations on the approval process for genetically engineered (GE) products developed	Relevant provisions will be complied by BAU in the design, operation, and management of the

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		domestically or by a third country. All GE products need to be approved before they can be imported or sold domestically within Bangladesh.	new research facilities.
Biosafety Guidelines of Bangladesh 2007 (proposed revision 2020)	MOEFCC	Legally binding framework under the Biosafety Rules of Bangladesh, to allow for the development of biotechnology in accordance with a biosafety review to assess any risks to the environment as well as human and animal health.	Relevant provisions will be complied by BAU in the design, operation, and management of the new research facilities.
Emergency Response Procedures for Genetically Modified Organisms in Bangladesh June 2018	MOEFCC	Guidance in the event of accident or unintentional release of GMOs, or unauthorized or accidental release when GMO activities are carried out during transit, transport, import, export, contained use or confined use of GMOs and their products. The release of GMO may cause adverse effects on the human and animal health as well as the environment.	BAU will adopt the emergency procedures relevant to GMOs in drafting and finalizing their emergency procedures.
National Biosafety Framework of the People's Republic of Bangladesh 2007	MOEFCC	Provide details on the procedures, evaluation and approval of safety compliance and management of biotechnology.	Relevant policy, legal, administrative and technical instruments on the safe transfer, handling, and use of GMOs that may result from modern biotechnology due

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
			to the project will be complied.
Guidelines for the Safety Assessment of Foods Derived from Genetically Engineered Plants 2012	MOEFCC	Technical guidance on the safety assessment process for whole foods, food products, and foods used as ingredients, that are derived from GE plant sources.	Agricultural research from the project that may result to GE plants producing food will follow the relevant guidelines for safety assessment.
Guidelines for Environmental Risk Assessment (ERA) of Genetically Engineered Plants 2016	MOEFCC	Specific assessments in the commercial cultivation and/or field release application to determine whether the environmental release of a GE crop will pose any risk to the environment	Project will involve biotechnology research activities. The ERA guidelines will be referred to in the event of potential environmental release of GE plants or crops resulting from research activities funded by the project.
Balu Mahal[*] (Sand Quarry) and Soil Management Act 2010 (amended in 2023 as Act No. 35 of 2023) * Balu mahal (a designated place where sand is lifted)	Ministry of Land	Delineates the areas where (legal) sand mining is allowed to improve river water navigation rather than to generate revenue. The Act imposes the restrictions of sand extraction from specific area on certain conditions and provides guidelines for erosion control. Section 4 states that extracting sand or soil is restricted from any place that fall within one kilometer of a residential area and where there are risks of erosion of a riverbank due to extraction of sand or	Project will require aggregate material. Only approved sources of aggregate material and authorized companies will be considered for the project.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		soil and if there is any risk of destruction of geographical, fisheries and aqua-environmental system and infrastructure. Section 11 cites that no person or company or group shall be entitled to extract sand or soil from a place that is not officially leased to them by the concerned authorities. Any offender shall be liable of up to two years of imprisonment and fines.	
Bangladesh Agricultural University Ordinance 1961	Government of the People's Republic of Bangladesh Legislative and Parliamentary Affairs Division	Established the agricultural university in Bangladesh to provide facilities for higher education and research work in agriculture and all its branches.	Consistent to its mandate, BAU is the primary implementing agency
National 3R (Reduce, Reuse & Recycle) Strategy 2010	MOEFCC	Provide guidelines to develop waste management strategy according to 3R and promotes user pay principles as well as the implementation of proper technology.	Will adopt relevant good practices in managing waste that will be generated by the project
Master Plan of BAU	Planning and Development, BAU	Architect Paul Rudolph was commissioned in 1961 by Muzharul Islam, a Bangladeshi architect to design an expansion of the campus including a	The new buildings, as part of future infrastructural progression of BAU, is in accordance with the master plan

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		new master plan, auditorium, dormitories, laboratories, instruction and recreation facilities.	
EIA Guidelines for Industries 1997 (revised in 2021)	MOEFCC	Outlines a simpler procedure to be followed by the industries in preparing the EIA for review by the DOE.	Will be referred to, as needed, in preparing and finalizing the environmental assessment.
Public Procurement Act (PPA) 2006	Ministry of Planning, Bangladesh Public Procurement Authority	Under Section 3(2) of the Act applies to the following: a) Procurement by Procuring Entities using public funds; b) Procurement by any government, semi-government or any statutory body established under any law; c) Procurement using public funds by a company registered under the Companies Act (Act No.18, 1994); and, d) Procurement under a loan, credit or grant agreement or under any other agreement with a development partner or with a foreign state or an organization, provided that if there is anything to the contrary in any such agreement entered into, the provision of that agreement shall prevail.	All procurement of goods, services, and equipment will comply with the relevant provisions under this Act.
Public Procurement Rules (PPR) 2008	Ministry of Planning, Bangladesh Public	Rules promulgated under PPA 2006 to ensure transparency,	All procurement of goods, services, and equipment will

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
	Procurement Authority	accountability, efficiency and fair competition in the procurement of goods, works or services using public funds.	comply with the relevant procedures under the Rules.
e-Government Procurement (GP) Guidelines 2018	Ministry of Planning, Bangladesh Public Procurement Authority	An e-GP system that is a single web portal from where and through which procuring agencies and entities will perform the procurement related activities and other procurement related information as required by PPA 2006 and PPR 2008 using a dedicated secured web-based dashboard.	All procurement of goods, services, and equipment will comply with the relevant procedures under the Guidelines.
Sustainable Procurement Policy (SPP) 2023	Ministry of Planning, Implementation Monitoring and Evaluation Division	Aims to mainstream the environment and climate changes into the government's planning and public expenditure process. SPP defines public procurement as sustainable when it integrates the requirements, specifications and criteria that are compatible and in favor of the protection of the environment, social progress and support the economic development by seeking resource efficiency, improving the quality of products and services, and ultimately optimizing	Will endeavor to procure the recommended list relevant to the project under the pilot implementation of SPP 2023.

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Regulation/Policy/Plan	Responsible Agency	Brief Description	Applicability to the Project
		the costs. Inclusion of the SPP policy principles will be through the issuance of a mandatory Guidelines on SPP, which incorporates minimum SPP policy provisions in the standard tender documents and implementation of the SPP pilot application in 2024. Appendix 3 of SPP includes the following list of SPP goods & services to primarily pursue for pilot implementation 1. Paper and paper products; 2. Office supplies; 3. Computer and other electronic equipment and supplies; 4. Office and other furniture or related wooden appliances; 5. Vehicles and other transportation equipment; and 6. Official paper-made publications	

30. Aside from the relevant regulations cited in Table II.1, the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials (September 2019) will be referred to for guidance relevant to this project.[14]

31. **Environmental Approval Process.** Section 12 of ECA 1995 stipulates that no industrial unit or project can be established or undertaken without obtaining an ECC from the DOE. According to ECR 2023, the DOE has classified various industrial units or projects based on potential adverse impacts to the environment and human health for the purpose of issuing the

[14] Established in August 2011, the Bangladesh Biosafety and Biosecurity Society, is a professional society to foster best and sustainable biosafety and biosecurity practices in Bangladesh considering the current situation of infectious diseases outbreaks and increasing demands for research and diagnostics of these disease-causing agents. https://bangladeshbiosafety.org/bangladesh-documents/ and https://bd-biosafetysecurity.org/organizations.

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ECC. This classification includes: (i) green, (ii) orange, (iii) red, and (iv) yellow. The green and yellow categories refer to industries or projects considered to be relatively pollution-free, or with minimal and less significant potential adverse environmental impacts. No environmental assessment will be required for green and yellow categories in the application for ECC. While there is no environmental assessment required for the yellow category, supporting documents for the ECC application include the detailed project information, process flow diagrams and effluent treatment layout/design. The orange category is considered to have a significant impact on the environment and human health while the red category are those projects and industrial units that may have strong impacts on the environment and human health and, thus, must minimize these impacts through mitigation measures and pollution control measures.

32. The orange category requires an IEE to be approved by the DOE before it can proceed to the ECC application while the red category requires an IEE to establish the TOR for the EIA and once the EIA and the EMP have been approved by the DOE, then the ECC application can proceed. Overview of the ECC application for the different project categories is shown in Figure 2.1.

33. Referring to Schedule 1 of ECR 2023, housing and urbanization project, and residential and commercial building of up to 5,000 square meters (m^2) to 20,000 m^2 built up area, the category is orange. The total footprint of the new buildings is about 12,800 m^2, thus, the anticipated project category is orange as Schedule 1 of ECR 2023 does not categorically include institutional building. BAU will submit this draft IEE in July 2024 to the DOE for review to confirm the anticipated orange category for the project, determine the data gaps to be complied (if any), and apply for the LCC and ECC. As a category orange project, an LCC and an ECC from the DOE will be required. The ECC is renewed annually. Requirements of the DOE in securing an ECC for an orange category project include the following:

(i) Completed application for ECC (Form 3);
(ii) Payment of the appropriate fees (Schedule 6 and Schedule 7);
(iii) Report on the feasibility of the project (if still being proposed);
(iv) Report on the IEE of the project, including process flow diagram, layout plan (showing ETP), design of ETP of the project (if still being proposed);
(v) Report on the EMP;
(vi) No objection certificate (NOC) from the local authority;
(vii) Prior issued LCC from the DOE;
(viii) Emergency plan relating to adverse environmental impact and plan for mitigation of the effect of pollution;
(ix) Outline of the relocation and rehabilitation plan (where applicable); and,
(x) Other necessary information as may be required

B. International Good Practice and Environmental Standards

34. Appendix 1 (paragraph 33) of SPS 2009 of ADB requires that during the design, construction and operation of the project, the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards, such as the World Bank (WB) Group's *Environment, Health and Safety (EHS) General Guidelines.*[15] Following this requirement, the WB-International Finance Corporation (IFC) EHS General Guidelines 2007 will apply to the project and these guidelines are

[15] World Bank Group, 2007. Environmental, Health, and Safety General Guidelines. Washington, DC.

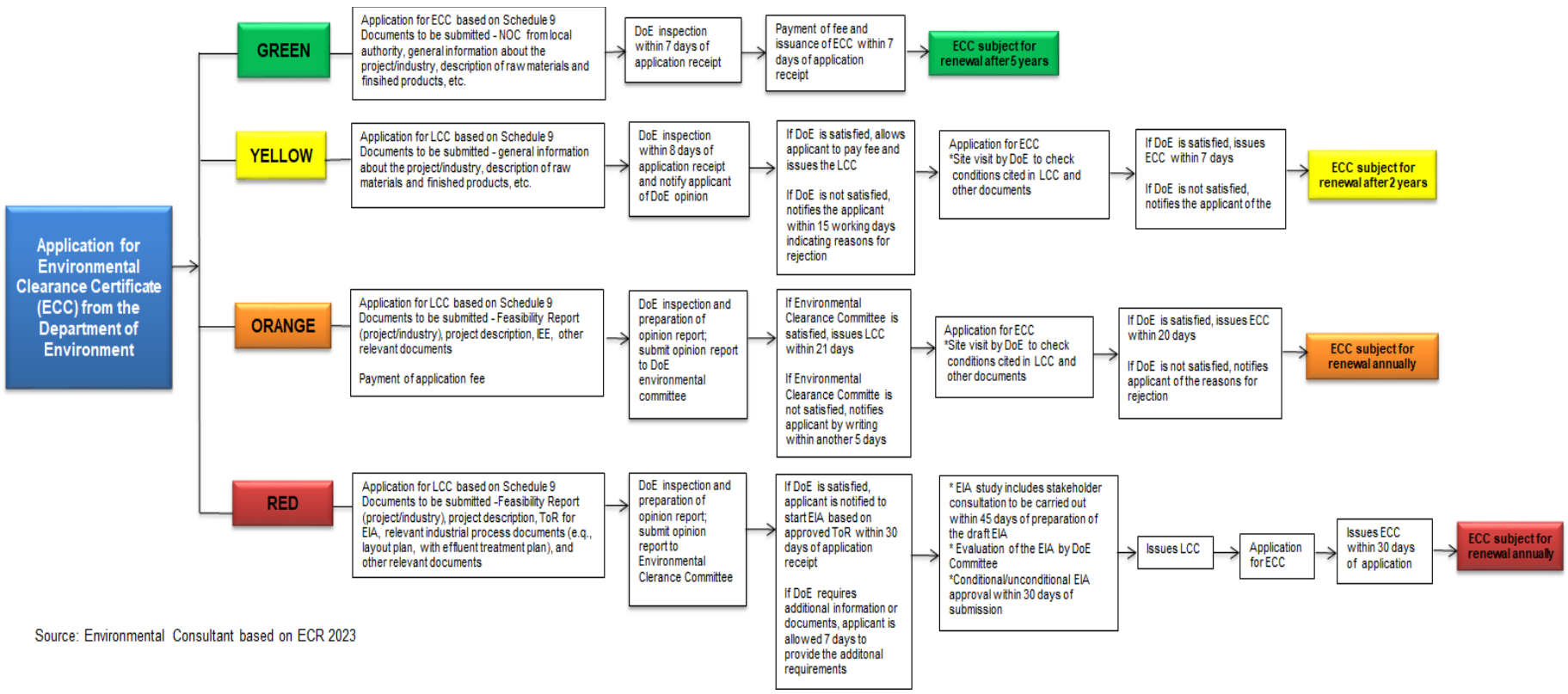
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organized as – environmental, occupational health and safety, community health and safety, and construction and decommissioning (Figure II.2). Applicable provisions from the Workers' Accommodation: Processes and Standards (August 2009) by the IFC and the European Bank for Reconstruction and Development (EBRD)[16] as well as the International Labor Organization, Safety and Health in Construction 2022 can be referred to.[17]

[16] IFC and EBRD. https://www.ifc.org/en/insights-reports/2000/publications-gpn-workersaccommodation.
[17] International Labor Organization. Safety and Health in Construction 2022. https://www.ilo.org/resource/other/safety-and-health-construction-revised-edition.

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Figure II.1: Approval Process for Environmental Compliance Certificate



Source: Environmental Consultant based on ECR 2023

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Figure II.2: Organization of IFC-WB EHS General Guidelines 2007

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Applicable Environmental Standards

35. The WB-IFC EHS Guidelines 2007 contain performance levels and measures that are normally acceptable and applicable to projects and SPS 2009 provides that, "when host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent." Table 2.2 lists the ambient air quality standards, Table 2.3 presents the ambient noise limits, and Table 2.4 gives the drinking water quality standards to comply with national regulations and SPS 2009.

Table II.2: Air Quality Standards

Parameter	Bangladesh Ambient Air Quality Standards		WHO Ambient Air Quality Guidelines[b] 2021 Global Update		Applicable to the Project based on SPS 2009	
	Standards ($\mu g/m^3$)[a]	Averaging Time	Standards ($\mu g/m^3$)	Averaging Time	Standards ($\mu g/m^3$)	Averaging Time
PM_{10}	50	1-year	15	1-year	15	1-year
	150	24-hour	45	24-hour	45	24-hour
$PM_{2.5}$	35	1-year	5	1-year	5	1-year
	65	24-hour	15	24-hour	15	24-hr
Sulfur Dioxide (SO_2)	80	24-hour	40	24-hour	40	24-hr
	250	1-hour	none	1-hour	250	1-hour
	none	10-minute	500[c]	10-minute	500	10-minute

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Parameter	Bangladesh Ambient Air Quality Standards		WHO Ambient Air Quality Guidelines[b] 2021 Global Update		Applicable to the Project based on SPS 2009	
	Standards ($\mu g/m^3$)[a]	Averaging Time	Standards ($\mu g/m^3$)	Averaging Time	Standards ($\mu g/m^3$)	Averaging Time
Nitrogen Dioxide (NO_2)	100	1-year	10	1-year	10	1 year
	none	24-hour	25	24-hour	25	24-hour
	none	1-hour	200[c]	1-hour	200	1-hour
Carbon Monoxide (CO)	none	24-hour	4,000	24-hour	4,000	24-hour
	5,000	8-hour	10,000[c]	8-hour	5,000	8-hour
	20,000	1-hour	35,000[c]	1-hour	20,000	1-hour
	none	15-minute	100,000[c]	15-minute	100,000	15-minute
Lead (Pb)	0.25	1-year	none	1-year	0.25	1-year
	0.50	24-hour	none	24-hour	0.50	24-hour
Ozone (O_3)	180	1-hour	none	1-hour	180	1-hour
	100	8-hour	100	8-hour	100	8-hour
	None		60	Peak season[d]	60	Peak season[d]

Sources: [a] Bangladesh Air Pollution Control Rules, 2022. https://mccibd.org/energy-and-environment/.
[b] WHO Ambient Air Quality Database 2021 Update. https://cdn.who.int/media/docs/default-source/air-pollution-documents/air-quality-and-health/who-air-quality-database-2021_final.pdf?sfvrsn=2371d57c_5.
[c] IFC-WB EHS General Guidelines 2007 (Table 1.1.1, WHO Global Update 2005).
[d] Average of daily maximum 8-hour mean O_3 concentration in the six consecutive months with the highest six-month running-average O_3 concentration.

Table II.3: Noise Standards

No.	Zones/Receptor	The Noise Pollution (Control) Rules 2006 (dBA)		WB-IFC EHS Guidelines 2007[a] One Hour L_{Aeq} (dBA)		Applicable to the Project based on SPS 2009	
		Daytime (6 a.m. – 9 p.m.)	Nighttime (9 p.m. – 6 a.m.)	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)	Daytime	Nighttime
1	Silent zone[b]	50	40	---	---	50	40
2	Residential zone (Residential; Institutional; Educational)[c]	55	45	55	45	55	45
3	Mixed zone (mainly residential area, simultaneously used for commercial and industrial purposes)	60	50	---	---	---	---
4	Commercial zone	70	60	70	70	--	--
5	Industrial zone	75	70	70	70	---	---

Sources: 1. Bangladesh Noise Pollution Control Rules, 2006; 2. WB-IFC EHS General Guidelines 2007 (Table 1.7.1)
[a] Guideline values are for noise levels measured out of doors. Source: Guidelines for Community Noise. WHO 1999.

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[b] 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.

[c] For acceptable indoor noise levels for residential, institutional and educational settings refer to WHO 1999. Noise monitoring should be carried out using a Type 1 or Type 2 sound level meter meeting all appropriate IEC standards. Leq means equivalent continuous sound level or the average sound pressure level over a specified time interval.

Table II.4: Drinking Water Quality Standards

Parameter	Unit of Measure	Standard
pH	-	6.5-8.5
Color	Hazen unit (HU)	15
Odor	-	odorless
Turbidity	NTU	5
Suspended Solid, (SS)	mg/L	10
Total Dissolved Solid, (TDS)	mg/L	1000
Oil & Grease	mg/L	0.01
Total chromium (Cr)	mg/L	0.05
Arsenic (as As)	mg/L	0.05
Cadmium (as Cd)	mg/L	0.003
Lead (as Pb)	mg/L	0.01
Total coliform	CFU/100 ml	0
Fecal coliform	CFU/100 ml	0
Total Hardness as CaCO3	mg/L	500
Mercury (Hg)	mg/L	0.001
Iron (Fe)	mg/L	0.3 – 1.0
Chloride	mg/L	250
Zinc	mg/L	5.0
Manganese (Mn)	mg/L	0.4
Copper (Cu)	mg/L	1.5
Zinc	mg/L	5

Source: ECR 2023, Schedule 2.

C. Relevant International Environmental Agreements

36. Bangladesh is a party to several international environmental agreements, and these will be referred to in the design and implementation of the project. Table 2.5 lists the applicable international environmental agreements that can provide guidance during project implementation.

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Table II.5: Relevant International Environmental Agreements

International Environmental Agreement	Date Ratified	Description	Relevance
Kyoto Protocol (1997)	22 October 2001	Adopted on 11 December 1997 and came into force on 16 February 2005, this international agreement commits its Parties to set internationally binding emissions reduction targets. This agreement is linked to the United Nations Framework Convention on Climate Change.	Guidance on the commitment to reduce greenhouse gas emissions such as use of renewable energy sources and green building features
United Nations Framework Convention on Climate Change (1992)	15 April 1994	Came into force on 21 March 1994, this framework aims to achieve the stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level low enough to prevent the dangerous anthropogenic interference with the climate system.	Guidance on the commitment to reduce greenhouse gas emissions such as use of renewable energy sources and green building features
Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) (1987)	2 August 1990	Entered into force on 1 January 1989, this international treaty was designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. This treaty also requires controlling emissions of substances that deplete ozone.	Guidance on the commitment to protect the ozone layer
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)	1 April 1993	Came into force on 5 May 1992, this convention aims to reduce the amount of waste produced by signatories and regulates the	Guidance on the commitment to reduce the generation and management of waste

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International Environmental Agreement	Date Ratified	Description	Relevance
		international traffic of hazardous wastes.	
Vienna Convention for the Protection of the Ozone Layer (22 March 1985)	2 August 1990	A framework for efforts to protect the globe's ozone layer by means of systematic observations, research, and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.	Guidance on the commitment to prevent activities that may have adverse effects on the ozone layer.
UNESCO World Heritage Convention (1972)	3 August 1983 (Accession) Accession – the state accepts the offer or the opportunity to become a party to a treaty already negotiated and signed by other states	This convention describes the concepts of nature conservation and the preservation of cultural properties. Parties agree to identify and nominate properties on their national territory to be considered for inscription on the World Heritage List, gives details of how a property is protected, and provides a management plan for its upkeep.	Guidance on the commitment to protect cultural properties. "Chance find" procedures included.
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	3 November 1983	Entered into force on 23 November 1972, this convention defines and provides for the conservation of the world heritage by listing the natural and cultural sites whose value should be preserved.	Guidance on the commitment to protect cultural properties. Project sites are not known as of archaeological or historical value but since excavation will be involved, "chance find" procedures are included as a precautionary measure.
Convention on Biological Diversity (1992)	3 May 1994	A framework for biodiversity, entered into force on 29 December 1993, and requires signatories to develop national strategies	Guidance on the commitment to protect biodiversity. Reference was made on determining for the presence of species

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International Environmental Agreement	Date Ratified	Description	Relevance
		(National Biodiversity Strategy and Action Plan) for the conservation and sustainable use of biological diversity.	of national and global conservation status.
Cartagena Protocol on Biosafety (2000)	24 May 2000 signed 5 May 2004 – date of entry into force	The protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology from one country to another. This is a supplementary agreement to the Convention on Biological Diversity which entered into force in September 2003.	Guidance on the commitment to ensure the safe handling, transport, and use of living modified organisms resulting from modern biotechnology.
Paris Agreement (12 December 2015)	21 September 2016	Entered into force on 4 November 2016, this agreement is within the UNFCCC that deals with greenhouse gas (GHG) emissions mitigation, adaptation and finance beginning 2020.	Guidance on the commitment to strengthen the global response to the threat of climate change. Reference was made on determining the mitigation and adaptation plans within the project through climate risk screening and assessment.
International Treaty on Plant Genetic Resources for Food and Agriculture (3 November 2001)	14 November 2003	Came into force on 29 June 2006, this international treaty aims at recognizing the enormous contribution of farmers to the diversity of crops that feed the world; establishing a global system to provide farmers, plant breeders and scientists with access to plant genetic materials; and in ensuring that recipients share benefits they	Guidance on the use of plant genetic materials

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International Environmental Agreement	Date Ratified	Description	Relevance
		derive from the use of these genetic materials.	
International Plant Protection Convention(6 December 1951)	1 September 1978	Each Party is required to make provision for an official plant protection organization for inspection, disinfection and the issuing of certificates relating to phytosanitary condition of plants and plant products. Also requires each Party to report to Food and Agricultural Organization (FAO) outbreaks and existence of pests, import requirements, methods of control.	Guidance on the commitment to protect plants
Convention for the Safeguarding of the Intangible Cultural Heritage (17 October 2003)	10 June 2009	Came into force on 20 April 2006 which aims to (a) to safeguard the intangible cultural heritage; (b) to ensure respect for the intangible cultural heritage of the communities, groups and individuals concerned; (c) to raise awareness at the local, national, and international levels of the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof; and (d) to provide for international cooperation and assistance.	Guidance on the commitment to protect intangible cultural heritage

D. Environmental Requirements of the Asian Development Bank

37. SPS 2009 embodies the environmental requirements and review procedures of ADB that apply to all projects and grants they finance. SPS 2009 covers three key safeguard areas: environment, involuntary resettlement, and indigenous peoples which aims to avoid adverse project impacts to both the environment and the affected people; minimize, mitigate and/or

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compensate for adverse project impacts; and help borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks.

38. SPS 2009 uses a categorization system to indicate the significance of potential environmental impacts and is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts within the project's area of influence. The project categorization system is described in Table 2.6.

Table II.6: Environmental Classification According to Safeguard Policy Statement 2009

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

Source: ADB. 2009. Safeguard Policy Statement.

39. **Disclosure Requirements.** Aside from the SPS 2009 requirements, the Access to Information Policy (AIP) 2018 sets the requirements for disclosure of project information to stakeholders in projects and grants funded by ADB.[17] Consistent to SPS 2009, this requires the disclosure of documents submitted by the borrower and/or client as follows:

(i) a draft EIA report for category A project, at least 120 days before Board consideration;
(ii) a draft environmental assessment review framework, where applicable, before appraisal;[18]
(iii) the final EIA or IEE, upon receipt by ADB;
(iv) a new or updated EIA or IEE, and a corrective action plan, if any, prepared during project implementation, upon receipt by ADB; and,
(v) the environmental monitoring reports, upon receipt by ADB.

[17] The Access to Information Policy replaces Public Communication Policy 2011.
[18] If no further mission for appraisal is required, the document will be posted before the management review meeting or the first staff review meeting for sovereign projects, or before the final investment committee meeting for nonsovereign projects, as applicable (ADB procedures).

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40. **Grievance Redress Mechanism.** Key requirement is to establish a grievance redress mechanism (GRM) for receiving and facilitating resolution of concerns and grievances raised by affected people on the environmental performance of the project. GRM needs to fit the risks and impacts of the project, address concerns and complaints promptly considering clear and transparency of the process, gender-responsive, culturally appropriate, and easy access to all affected people.

41. **Consultation and participation.** Stakeholders' engagement is required with a process such that – (i) it starts during the early stage of project preparation and throughout the project cycle, (ii) timely disclosure of relevant and adequate project information clear and accessible to affected people, (iii) conducted free from intimidation or coercion, (iv) gender-inclusive and responsive and fit to the needs of vulnerable groups, and (v) incorporating in the project design and mitigation measures, all relevant views from the affected people and stakeholders, thus, sharing in the development benefits and opportunities as well as implementation issues.

42. **Monitoring and reporting.** Borrower is required to monitor project implementation corresponding to its risks and impacts, and to submit periodic environmental monitoring reports on the status of implementing environmental safeguard plans and measures.

43. **Existing activities or facilities**. If the project involves existing activities or facilities, an environmental audit will be conducted to determine the existence of any areas where it may cause or is causing environmental risks or impacts. Findings will be included in the environmental assessment.

44. **Unanticipated environmental impacts**. Where unanticipated environmental impacts become apparent during project implementation, the borrower/client will update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

45. **Occupational health and safety**. The borrower/client will provide workers[19] with a safe and healthy working environment considering the inherent risks in the work areas, including physical, chemical, biological, and radiological hazards. Will also take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place. Preventive and protective measures will be applied consistent to international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.[20]

46. **Community health and safety.** The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities (in this case, students, faculty and

[19] Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

[20] World Bank Group, 2007. Environmental, Health, and Safety General Guidelines.

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staff) throughout the project cycle and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts. The borrower/client will inform affected communities of significant potential hazards in a culturally appropriate manner and be ready 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. Appropriate information about emergency preparedness and response activities, resources, and responsibilities will be disclosed to affected communities.

47. As a precautionary measure, it is recommended that the Borrower is prepared to respond to another outbreak of COVID-19 or any other public health threats consistent with the guidelines of the government and the World Health Organization (WHO).

48. **Prohibited investment activities.** ADB funds will not finance activities on the ADB Prohibited Investment Activities List set forth in Appendix 5 of SPS 2009 (Figure 2.3).

Figure II.3: ADB Prohibited Investment Activities List

Prohibited Investment Activities List[1]

The following do not qualify for Asian Development Bank financing:

(i) production or activities involving harmful or exploitative forms of forced labor[2] or child labor;[3]
(ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase-out or bans, such as (a) pharmaceuticals,[4] pesticides, and herbicides,[5] (b) ozone-depleting substances,[6] (c) polychlorinated biphenyls[7] and other hazardous chemicals,[8] (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,[9] and (e) transboundary trade in waste or waste products;[10]
(iii) production of or trade in weapons and munitions, including paramilitary materials;
(iv) production of or trade in alcoholic beverages, excluding beer and wine;[11]
(v) production of or trade in tobacco;[10]
(vi) gambling, casinos, and equivalent enterprises;[10]
(vii) production of or trade in radioactive materials,[12] including nuclear reactors and components thereof;
(viii) production of, trade in, or use of unbonded asbestos fibers;[13]
(ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and
(x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

[1] ADB SPS 2009, Appendix 5, p76.
[2] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.
[3] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).
[4] A list of pharmaceutical products subject to phaseouts or bans is available at http://www.who.int.
[5] A list of pesticides and herbicides subject to phase-out or bans is available at http://www.pic.int.
[6] A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phase-out dates. Information is available at http://www.unep.org/ozone/montreal.shtml.
[7] A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.
[8] A list of hazardous chemicals is available at http://www.pic.int.
[9] A list is available at http://www.cites.org.
[10] As defined by the Basel Convention; see http://www.basel.int.
[11] This does not apply to project sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a project sponsor's primary operations.
[12] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.
[13] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

49. **Bid and contract documents.** The IEE together with the EMP will be included in the bid and contract documents to be verified or confirmed by the project management unit (PMU). The project implementation committee (PIC) and the PMU will ensure that the bid and contract documents will cover provisions that require contractors to comply with ADB requirements, include

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the proposed laydown areas, construction camps, storage area/stockyard, disposal sites for solid and hazardous waste, hauling roads, etc.; mitigation measures and monitoring plan based on the EMP, and adequate budget for their implementation. Any non-compliance to the EMP will require corrective actions with budget and timeframe for implementation.

50. **Award of contract.** Considered as best practice, the Borrower will award works contract provided (i) relevant provisions from the EMP are incorporated into the works contract; (ii) this draft IEE has been updated and/or revised to incorporate the latest or final building design and ADB has reviewed and cleared the updated IEE, (iii) the DOE has issued the ECC, and (iv) applicable permits have been secured from relevant government authorities.

51. Table 2.7 presents a summary of the implications of SPS 2009 for the project.

Table II.7: Implications of the Safeguard Policy Statement 2009 for the Project

No.	SPS 2009 Principles	Description
1	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	Components with environmental implications have been identified as under Output 1 of the Project: (a) construction of a new six-story buildings within the university premises of BAU, and (b) renovation of existing buildings such as the classroom, library, auditorium and sports facilities. Output 3 also includes new eight-story building construction of BICAR funded by EDCF. ADB will finance construction supervision consulting services for all civil works under the project. A REA checklist was completed in June 2020 and the environment category is B based on SPS 2009 requiring an IEE.
2	Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	An IEE following the requirements of SPS 2009 was conducted for the components with environmental implications.
3	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts	Alternative sites for the location of BICAR, were considered and included in the IEE.

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No.	SPS 2009 Principles	Description
	and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	
4	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an (EMP) that includes the proposed mitigation measures, environmental monitoring, and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter-pays principle.	An EMP is included in the IEE for the components with environmental implications. The EMP will provide guidance to the construction contractors and their subcontractors (if any) who will be engaged during project implementation to ensure compliance with the relevant provisions in SPS 2009.
5	Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and considered. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	Due to the COVID-19 pandemic, hybrid consultations were done on 13 July 2020 through virtual meeting with 21 participants and an online survey in August 2020 from the BAU website participated by 57 respondents. With the lifting of restrictions for COVID-19, a face-to-face consultation was done on 20 December 2022 in BAU campus with 103 participants. Another online survey for BAU students was conducted on 10-30 November 2023 with 987 respondents. The inputs provided by the participants were incorporated in the project design as relevant and applicable for the project. A three-tiered grievance redress mechanism (GRM) is included in the IEE including the proposed composition of the grievance redress committee (GRC). The implementation of the GRM will be monitored by the PMU established under the UGC.
6	Disclose a draft environmental assessment (including the EMP) in a	The IEE will be disclosed to a wider audience via the ADB and BAU project web page. As a good

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No.	SPS 2009 Principles	Description
	timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	practice, the IEE will also be endorsed by the MOE for public disclosure through the ADB website.
7	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	At the construction phase, the contractors (and subcontractors) will be responsible for implementing the EMP and will be monitored by the PMU. The contractors will submit monthly progress reports on the implementation of EMP to the PMU. Environmental monitoring reports (EMRs) and corrective actions (if needed) will be prepared by the PMU and will be disclosed to ADB website. EMRs will be submitted by the PMU to ADB semi-annually during construction phase and annually post-construction phase.
8	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	Proposed interventions with environmental implications are within the existing premises of BAU. The proposed location does not fall within the core, buffer and eco-sensitive zones of legally protected areas for biodiversity conservation and legally protected monuments of archaeological and historical importance.
9	Apply pollution prevention and control technologies and practices	Construction and post-construction activities will generate waste and may increase ambient dust

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No.	SPS 2009 Principles	Description
	consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	and noise levels. A survey for the presence or absence of asbestos or asbestos-containing materials (ACM) in the existing buildings for renovation and refurbishment will be done prior to any civil works. Any presence of asbestos or ACM in the debris from existing buildings will be dealt with based on the requirements of the government and ADB guidance.[21] Vegetation and land clearing will be done. No hazardous chemicals will be used in vegetation clearing. The new buildings will use Energy Star-labeled products and will incorporate green building features. (Refer to https://www.energystar.gov/products?s=mega). Biosafety measures for the two Biosafety Level 2 (BSL 2) and one Biosafety Level 3 (BSL 3) laboratories in BICAR will follow the relevant guidance and requirements by the government, the WHO, and the international environmental agreement set forth in the Cartagena Biosafety Protocol and the Convention on Biological Diversity where Bangladesh is a signatory.
10	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Construction works may cause accidents or injuries to workers and contractors (and subcontractors) will be required to comply with the EMP and to implement the appropriate Environmental Codes of Practice. Compliance will be monitored by the PMU. While restrictions have been lifted, it is recommended that contractors be prepared to respond to another outbreak of COVID-19 or any public health threat by making a health and safety plan as an integral part of the Construction EMP (CEMP).
11	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials	The sites are within the existing premises of BAU and are not known to have physical cultural resources as defined by SPS 2009. However, since excavation and land clearing will be involved, a "chance find" procedures will be included as part of the EMP.

[21] Refer to ADB Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (March 2022), https://www.adb.org/publications/good-practice-management-control-asbestos.

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No.	SPS 2009 Principles	Description
	that may be discovered during project implementation.	

IEE = initial environmental examination, PMU = project management unit, SPS = Safeguard Policy Statement.

E. Environmental Requirements of Export-Import Bank of Korea

52. The Economic Development Cooperation Fund (EDCF) of the Export-Import Bank of Korea will provide collaborative cofinancing (not administered by ADB) for the construction of the new BICAR at BAU. However, ADB will finance the construction supervision consultancies of all civil works under the project including the construction of the BICAR building. This center will facilitate industry collaboration while researchers, laboratory technicians and administration staff are supported by the government.

53. Established in 1976, the Export-Import Bank of Korea (also referred to as KEXIM) provides comprehensive export loan and guarantee programs to support Korean enterprises conducting business overseas. KEXIM is responsible for the operation of the EDCF which was established on 1 June 1987 to promote economic cooperation between Korea and developing countries. EDCF assists partner countries by providing funds for their industrial development and economic stability.

54. EDCF has developed their Safeguard Policy 2016 with principles, standards, and procedures adapted from SPS 2009 and the World Bank in terms of project screening and categorization, environmental and social impact assessment, information disclosure, monitoring and reporting, grievance redress mechanism, stakeholders' consultation and participation, and accountability mechanism. On 1 July 2020, the Safeguard Policy 2016 was updated for addressing environmental and social issues in project design, implementation, and operation.[22] EDCF will not finance projects that do not comply with its Safeguard Policy nor projects that do not comply with the borrower's national environmental and social laws and regulations including laws that implement the borrower's country obligations under international law. The objectives of the policy are as follows:

- avoid adverse impacts of projects on the environment and affected people, where possible;
- minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and,
- help the borrowers to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

55. These safeguards place the compliance responsibility to the borrower and for EDCF to undertake the review of the environmental and social due diligence. The borrower is expected to consider the environmental and social considerations during the initial stages of project planning; avoid negative impacts including potential risks and if it cannot be avoided, mitigation and/or compensatory measures shall be prepared; and conduct meaningful consultations with stakeholders and disclose relevant project information throughout the project cycle.

[22] KEXIM. EDCF Safeguard Policy.

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56. KEXIM classifies projects to be funded by EDCF into one of the four categories based on type, location, sensitivity, scale, potential project impacts including the size and nature of the risks. Project classification is described below:

Category	Definition	Assessment Requirement
A	(High risk). Likely to have significant adverse environmental and social impacts and high risks that are irreversible, diverse, or unprecedented, that may affect an area larger than the sites or facilities. Includes projects in sensitive sectors or located in or near sensitive areas such as large-scale dam construction with large involuntary resettlement, and/or negative impacts and risks to indigenous peoples.	Full scale environmental and social impact assessment (ESIA) - draft or final ESIA analyzes a project's environmental and social impacts and alternatives. ESIA offers recommendations to avoid, reduce, and/or compensate for risks. It also prepares project monitoring plans
B+	(Substantial risk). Likely to have substantial adverse environmental and social impacts that are less adverse than those of category A. Impacts and risks can be managed and predicted in a manner consistent with the EDCF Safeguard Policy.	ESIA - draft, final, framework, strategy, plan, and/or environmental impact assessment
B	(Moderate risk). Potential environmental and social impacts are less adverse than those of category B+. 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 B+ projects.	Initial environmental and social examination (IESE) – draft, final, framework, strategy, plan, and/or environmental impact assessment IESE is an abbreviated form of ESIA and is an assessment of basic environmental and social impacts of a project. IESE also recommends relevant mitigation measures and monitoring plans
C	(Low risk). Likely to have minimal or no adverse environmental and social impacts.	ESIA and IESE are not required.

Source: EDCF. 2020.

57. **Information disclosure**. The borrower is required to provide the environmental and social information to affected communities on (i) objectives, nature, scale, and period of activities, (ii) potential risks and impacts including mitigation measures, and (iii) process of stakeholder participation and grievance redress mechanisms. It is also the responsibility of the borrower to provide the relevant environmental and social information on time, in an accessible location, and in a form and language that can be easily understood by affected people and other stakeholders. Safeguard Policy 2020 provides that KEXIM will disclose on their website the results of screening (category – A, B+, and B) if an appraisal has been done and upon consent of the borrower, the environmental and social information they submitted (excluding confidential information). Project

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documents subject to KEXIM information disclosure policy includes: (if) results of project categorization, (ii) full or summary ESIA report (draft or final) for category A, (iii) full or summary ESIA report (draft or final) for category B+, (iv) full or summary IESE report (draft or final) for category B, (v) full or summary resettlement plan (RP) or indigenous peoples plan (IPP) (draft or final) if applicable, and (vi) any other approved forms of documents.

58. **Consultation and participation.** The level of participation required in the consultation is proportionate to the concerns raised by the affected communities and the potential impacts of the project. If needed, separate meetings can be done to get the views of men and women and then also reflect their different interests and priorities. If indigenous peoples are involved, the borrower is responsible to work on special mechanism for them to participate and express their views. The results of the consultations will be included in the ESIA or IESE. Consultations should begin in the project preparation stage and will continue throughout the project cycle conducted in an atmosphere that is free of intimidation or coercion, provide information appropriate and understandable to affected people, gender-inclusive and considers the needs of disadvantaged and vulnerable groups. Views of affected people and stakeholders from the consultations will be incorporated during the design, preparation of mitigation measures as well as in the allocation of development benefits and opportunities.

59. **Local grievance redress mechanism.** To ensure that concerns and grievances from affected people are received and resolved at the project level, a grievance redress mechanism (GRM) scaled to the project risks and impacts shall be established by the borrower. The GRM should resolve grievances received in a timely manner through a process that is transparent, understandable, culturally appropriate, gender-responsive and readily accessible from the affected people.

60. **Monitoring.** For category A, B+, and B, monitoring report at least annually will be submitted by the borrower to KEXIM until completion of project construction. If needed for category A and B+ projects, the KEXIM may request semi-annual monitoring reports during project construction until the expiration of the loan contract. Participation of representatives from the affected people in the monitoring can be considered by the borrower. The costs of monitoring and associated expenses for reporting will be included in the project budget. Periodic monitoring reports will be posted in a location readily accessible to the public.

61. KEXIM will review the monitoring reports from the borrower, prepare evaluation reports on safeguard compliance, assists the borrower (if needed) in developing corrective measures to redress non-compliance issues. In case of unanticipated environmental and social impacts identified during project implementation, the borrower will submit a report to KEXIM, reassess impacts and update the environmental and social management plan (ESMP) to reflect the appropriate mitigation measures. The KEXIM will review the updated ESMP.

62. **Accountability Mechanism** This is the opportunity for people adversely affected by projects funded by EDCF to submit grievances, seek redress, and to report alleged violations of EDCF Safeguard Policy and procedures. The borrower will be assisted by KEXIM in finding solutions to the complaints of project-affected people.

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III. DESCRIPTION OF THE PROJECT

A. Need for the Project

63. Most part of Bangladesh is composed of the Ganges-Brahmaputra Delta, the largest delta on earth, characterized by pronounced flatness, predominantly composed of fertile alluvial soil from sediments of the Himalayas and deposited by the rivers Ganges, Brahmaputra, and Meghna forming mainly the agricultural character of the country.

64. In 2022, the agriculture sector employs 45.4% of the labor force consisting of 26.2% women and sharing about 11% in the gross domestic product (GDP).[23] Given this, the government recognizes the key role of agriculture in their economy. To sustain and enhance its vital role, government support will be needed.

65. While critically important to the economy, agriculture is highly vulnerable to climate change. The impacts of varying temperature and precipitation, frequent cyclones, and natural disasters have tremendous and devastating consequences not only to farmers, farmlands, food productivity but to the education in the agriculture sector as well in terms of research and development application and related field projects. It is estimated that by 2050, Bangladesh will lose 2.0% of its annual GDP due to climate change impacts.[24]

66. Arguably, one of the key areas for government support is on agricultural education and research through improved and climate-resilient educational facilities, financial support for higher agricultural education and research, improvement in the curricula of agricultural tertiary education to meet the changing demands of the private sector, provide incentives for industry collaboration and private sector participation in promoting research and development (R&D), and promote women participation. In the review of the Bangladesh tertiary education sector by the World Bank (2019), it indicates that the “experience in competitive innovation funds shows high potential for collaborative research between academia and industry through the emergence of innovation in the fields of medicine and agriculture,” but Bangladesh ranks poorly. As well, research output generation in Bangladesh is still weak and has the lowest volume of citable documents produced in 2015.[25]

67. To address the challenges in the agriculture sector particularly on sustained agricultural productivity and recognizing that tertiary agricultural education is a critical support in the improvement of agricultural productivity, and in adaptation to climate change impacts, the Government of Bangladesh requested the Asian Development Bank (ADB) for a concessional loan of $120 million and the EDCF for a concessional loan of $61.3 million to finance the Strengthening Agricultural Tertiary Education Project (SATEP).

68. SATEP aims to enhance the industry responsiveness of advanced climate-smart agricultural tertiary education and research. SATEP supports to develop the BAU as a center of excellence on agricultural tertiary education, build a modern technology-responsive agricultural tertiary education system, create facilities and enabling environment for innovative R&D, and promote enhanced linkages between academia and agro-industry.

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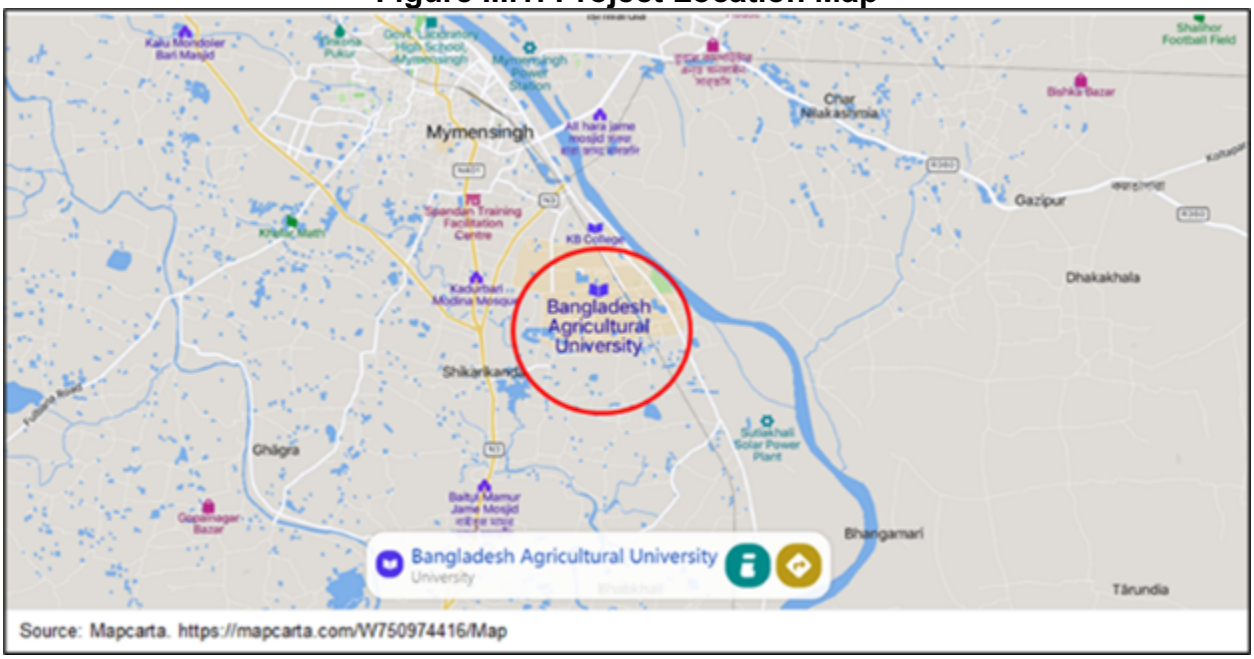
[23] Bangladesh Bureau of Statistics. 2023. *Labour Force Survey 2022*.
[24] ADB. 2023. *Bangladesh’s Agriculture, Natural Resources, and Rural Development Sector Assessment Strategy*.
[25] World Bank. 2019. Bangladesh Tertiary Education Review. Skills and Innovation for Growth.

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B. Location of the Project

69. Established in 1961, BAU has been the central hub for higher agricultural education and research in Bangladesh and the second largest university next to Chittagong University in terms of occupied area. Located approximately three kilometers south of Mymensingh District, BAU occupies an area of 510.3 hectares and bounded on the east by the Brahmaputra River. Figure 3.1 shows the location map.

Figure III.1: Project Location Map



70. The faculty system of BAU has a total of 44 departments and six faculties. As of 2021, BAU has 567 faculty members and a total of 8,808 students.[26] Aside from the academic community, BAU also runs facilities that provide technical support to farmers and rural communities around the campus. The BAU Research System (BAURES), established in 1984, coordinates and manages the research projects conducted by the faculty while the BAU Extension Center (BAUEC) supports more than 40 agricultural extension services for research and education to 10 major farms for the programs on agronomy, horticulture, genetics and plant breeding, seed pathology center, dairy, sheep, goat, and poultry farms. BAU has a Germ-plasm Center that takes care of about 161 species including many tropical fruits such as mango, lychee, guava, lemon, jackfruit along with several kinds of medicinal plants.

C. Project Outcome and Outputs

71. **Outcome.** The proposed project is envisioned and designed to be consistent with the technologies used for higher agricultural productivity and profitability, and enhancement of industry responsiveness of advanced climate-smart agricultural tertiary education and research.

72. Specific objectives of the project are as follows:

[26] Development Project Proposal (DPP), April 2024 and Bangladesh Agricultural University. BAU at a Glance.

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(i) Establishment of BICAR;
(ii) Strengthening the academic and research infrastructure of BAU;
(iii) Introduction, modernization and accreditation of course-curricula and academic structure of BAU;
(iv) Automation, e-governance, and ICT integration;
(v) Professional development through training and collaboration;
(vi) Innovation and incubation to commercialize technologies and establish linkages with agro-industry;
(vii) Support national interdisciplinary research for accelerating technology adoption in agriculture; and,
(viii) Support networking with leading national, regional, and international universities and research institutions.

73. **Outputs.** The project has four outputs envisioned to establish BAU as a center of excellence in tertiary agriculture education and research with modern and climate-resilient facilities, safe and inclusive learning environment for women. Table 3.1 presents the project outputs.

Table III.1: Project Outputs of SATEP

Output	Description
Output 1: Quality of climate-smart tertiary agricultural education improved.	Support for the construction of a new building for HCDI, and the IIFS as well as refurbishment of existing education facilities such as classrooms and common facilities (e.g., library, auditorium and sports facilities). Renovation works will include women- and disability-friendly facilities (e.g., separate toilets, separate prayer rooms, study and rest areas, childcare facility, and easy access for people with disability for all faculties). This output will support procurement of basic and intermediate agricultural equipment for teaching and research while allocation for infrastructure development and procurement of equipment will be need-based. This output will also support pedagogical training of the academic staff for adopting climate-smart interdisciplinary and emerging technologies including online training. In this output, BAU will: • Develop a gender policy to ensure recruitment and training of staff and students are gender sensitive and inclusive. • Train laboratory technicians through overseas training while UGC will select capable students and faculty for overseas long-term training programs for master's and PhD including female target. • Engage international and industry experts for climate-smart curriculum revisions and pursue international accreditation of the new and updated programs to ensure continuous improvement beyond project period. The blended learning for agricultural education will also be strengthened including e-journal subscriptions, and selected BAU online lectures will be made available for public to help farmers adopt new technologies which contribute to reduce poverty and inequalities.

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Output	Description
Output 2: Relevance and entrepreneurial tertiary agricultural education enhanced.	Support for agricultural startup companies based on competitively selected business plans (at least 2 will be women-led). Idea competitions which are open to other universities will be held. From this output, BAU will: • Provide certificate programs for professionals including online courses in collaboration with industry partners to help industry catch up with fast changing agricultural technologies. • Establish Institute of Climate Change and Environment and Institute of Biotechnology which can offer climate change master program and biotechnology with industry demands. • Strengthen engineering and technology faculties as well as mainstream project-based learning, industry-based internship, or capstone projects for students. The university–industry linkage will be promoted, particularly with transnational companies leading agricultural technologies. • Strengthen student services for career counseling and alumni networks, especially for female students to work for agricultural industry.
Output 3: Green and climate-resilient agricultural research and development strengthened.	Support in the procurement of goods, furniture and equipment for seven specialized laboratories at BAU-BICAR.[27] This includes high-end laboratory equipment for advanced agricultural and climate change research, which will be open for fee per use to external users.[28] This center will be constructed by EDCF financing support to facilitate industry collaboration, while researchers, laboratory technicians and administrative staff will be supported by the government. Also, this output will support competitive R&D grant through UGC focusing on (if) industry collaboration to address agricultural industry problems and develop solutions; (ii) climate change research in agriculture, (iii) interdisciplinary work to develop new agricultural products or services for rural development and food security; and (iv) cutting edge and priority agricultural research including artificial intelligence. This is open to other universities and more emphasis will be given to industry collaboration and climate change research (at least 20% female participation). The universities will also benefit from the training for academic staff on academic research publication (at least 25% female participation).
Output 4: High-technology and climate-smart agricultural university network and project management supported.	Support for systematic networking with leading national, regional, and international universities and research institutions such as the National Instrumentation Center for Environmental Management at Seoul National University. Networking with climate-smart high-technology agricultural education and research institutions will assist the BAU in establishing itself as a South Asia regional hub for accelerating the speed of technology adoption. BAU will receive students from neighboring countries with specific female target and will share research findings through annual conferences by inviting experts in Bangladesh and beyond. In addition, this output will

[27] The seven laboratories are (i) imaging laboratory, (ii) climate-smart precision agriculture and modeling laboratory, (iii) analytical laboratory, (iv) post-harvest technology and food processing laboratory, (v) food safety laboratory, (vi) genomics & bioinformatics laboratory and (vii) diagnostics and vaccines laboratory.

[28] The Economic Development Cooperation Fund (EDCF) of the Export-Import Bank of Korea will cover civil works, including biosafety level 2 and 3 requirements, and ADB will procure goods and equipment.

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Output	Description
	support project management by recruiting consultants related to procurement, equipment, financial management, safeguards, and gender. This output will also assist BAU in establishing management information system with sex disaggregated data for facilitating efficient administration process and student learning process. BAU will also organize training for occupational health and safety standards, climate risks, earthquake evacuation and information security as per BAU disaster management plan and business continuity plan.

Sources: ADB and SHED, MOE DPP May 2024.

74. As shown in Table 3.1, the output that will involve civil works with potential environmental impacts and risks to occupational and/or community health and safety is limited to Output 1 and Output 3. Under output 1, there will be construction of a new building for HCDI and IIFS as well as the refurbishment of selected existing buildings such as the classroom, library, auditorium and sports facilities. Output 3 also includes the new construction of BICAR funded by EDCF. The discussions on the construction of the new buildings and renovations were based on the Project Feasibility Study November 2023 and Development Project Proposal (DPP) May 2024.

D. Construction and Operation of BICAR

75. BICAR will support national interdisciplinary research, commercialize technologies, and to establish linkages with agro-industry. The BAU innovation, incubation, and startup center (BIISC) will be part of BICAR which will become the best wing to work for technology innovation and incubation and linkages with the industry. BIISC will help new entrepreneurs to tailor the support they need to fit the specific challenges of new venture in agriculture and biotechnology.

76. BICAR will have seven laboratory divisions: (i) imaging division, (ii) climate-smart precision agriculture and modelling division, (iii) analytical division, (iv) post-harvest technology and food processing division, (v) food safety division, (vi) genomics and bioinformatics division, and (vii) vaccines and diagnostics division. The description of the seven laboratories is given in Appendix 1. It is expected to have innovative research facilities in these areas. BICAR will be designed to consist of a laboratory building, incubation center, administration and common facility, utility and service, and an animal experimentation facility covering a total area of about 41,660 m^2. The incubation center will have physical facilities supporting the commercialization of research innovation and in facilitating interactions between researchers and entrepreneurs.

77. The estimated cost of constructing the new building for BICAR is $62.74 million. Table 3.2 shows the output plan of BICAR, Table 3.3 presents the architectural plan, and Figure 3.2 shows the perspective model. The architectural plan includes the basic infrastructure within the site, (i.e., electricity, water, sewerage, gas), roadway and landscape.

78. BAU will be responsible for the following: (i) project site preparation – covers the obstruction clearance (i.e., including underground obstructions detected by geological survey), land survey, etc., (ii) off-site utilities installation - electricity, water & sewer, gas, handling of construction-related permission (This will be financed under the ADB loan).

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Table III.2: BICAR Output Plan

Zone	Name of Space	Basement	Ground floor	1st floor	2nd floor	3rd floor	4th floor	5th floor	6th floor	7th floor	Total (ft^2)	
Built Area	Laboratory Building	35,226.97	35,226.97	35,762.09	35,279.58	35,279.58	35,279.58	35,279.58	35,279.58	35,279.58	317,893.49	
	Incubation Center	10,158.43	10,020.11	10,048.02	10,048.02	10,048.02	10,048.02				60,370.62	
	Admin & Common Facility	9,852.43	18,208.00	13,797.04							41,857.47	
	Utility & Service		7,552.50								7,552.50	
	Total Floor Area	55,237.83	71,007.59	59,607.15	45,327.60	45,327.60	45,327.60	35,279.58	35,279.58	35,279.58		**427,674.09**
	Total Ground Coverage											**71,007.59**
Green Area												203,058.74
Road & Pavement	Road										34,088.45	65,231.52
	Pavement										31,143.07	
Subtotal area												**339,297.85**
	Animal Experimentation Facility											20,744.49
Total Area												**448,418.57**

Source: SATEP Feasibility Report, November 2023.

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Table III.3: Architectural Plan of BICAR

Category		Building 1	Building 2	Building 3	Building 4	Another Compound	Total Area
Purpose		Laboratory Building	Incubation Center	Admin & Common Facilities	Utility & Service Building	Animal Experimentation Facility	
Size	ft^2	317,893	60,371	41,857	7,553	20,744	448,418
	m^2	29,533	5,609	3,889	702	1,927	41,660
	Floor	Below 1 + Above 8	Below 1 + Above 5	Below 1 + Above 2	Above 1	Above 1	

Source: Project Feasibility Report, November 2023.

79. BAU will be responsible for the operation and maintenance of BICAR which includes provision of staff, equipment, and budget. Also, the BAU will prepare and approve its disaster management plan and business continuity plan, and organize training for occupational health and safety standards, and climate change risks. BAU will also conduct earthquake evacuation and fire drills to ensure the safety of students and faculty members.

Figure III.2: Perspective View of BICAR



a. Location

80. The site for the new BICAR is within the premises of BAU opposite the Bangladesh Fish Research Institute (BFRI). Land required for BICAR is approximately 4.166 hectares (ha). The site is about 3.5 kilo meter (km) to 4 km southeast from the Mymensingh District headquarters and about 100 km north from Dhaka City. The Old Brahmaputra River flows 1.5 km east from the project site and the site can be accessed through the eastern bypass of the City of Mymensingh. Buildings close to the vicinity of the project site are the Bangladesh Institute of Nuclear Agriculture (BINA), BFRI, BFRI Guest House, Germ-Plasm Center, BFRI Mosque, and the BAU Railway Station. Figure 3.3 shows the project site.

Figure III.3: Project Site Street View and Current Condition, BICAR

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Source: Project Feasibility Study November 2023

b. Codes and Practice for Design

81. The design and construction of BICAR will be guided by the following standards and codes:

1. Structural Design

Compatible Codes with Bangladesh National Building Code (BNBC) 2020	
American Concrete Institute (ACI) 318-08	ACI 318M-08: Building Code Requirements for Reinforced Concrete, 2008
American Institute of Steel Construction (AISC) 360-05	Specification for Structural Steel Buildings
American Society of Civil Engineers (ASCE) 7-05	ASCE/SEI 7-05: Minimum Design Loads for Buildings and Other Structures
EURO CODE	Eurocode 8: Design of structures for earthquake resistance

i. Electrical, Mechanical, Fire and Plumbing Engineering

- BNBC 2020
- National Fire Protection Association (NFPA)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

ii. Programs and Software

- AutoCAD 2019, 2021 for drawing
- Sketchup 2019 for visualization
- ETABS 2018 for Structural Design
- Trace-700 for HVAC Calculation
- Autodesk Revit-2021 for HVAC Design

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2. Materials to be used for Construction

- Main Structure
  - Framed structure with reinforced concrete
  - Pile, mat and isolated footing foundation
- Peripheral Partition
  - Traditional brick & mortar (250mm)/Concrete Hollow Block
- Peripheral Glazing
  - Double glazed glasses with 1 low-emissivity (low e) glass
- Internal Partition
  - 125 mm, 250 brick
  - Sandwich panel
  - Acoustic gypsum drywall
  - Toughened glass
- Flooring
  - Finished concrete.
  - Vinyl flooring
  - Resinous flooring
  - Epoxy flooring
  - Rubber flooring as a preferred alternative
- Ceiling
  - Finished concrete ceiling
  - Gypsum ceiling
  - Concrete/Hi Strength gypsum ceiling as service ceiling

82. Finishing of construction materials will be smooth, can be easily sanitized, and resistant to degradation from chemicals and disinfectants commonly used within the laboratory environment.

83. BICAR will work on the national and international accreditation to establish the benchmark reference and could be the National Bureau of Agriculture, Commodity and Food Standards, ISO 90001, ISO/IEC 17025, International Laboratory Accreditation (ILAC), and the Asia Pacific Laboratory Accreditation Cooperation.

3. Biosafety Requirements for BICAR

84. Biosafety is required for specific areas and rooms for each building allocated for research and experimental activities in BICAR. This will be the laboratory building and the animal experimentation facility. According to the Centers for Disease Control and Prevention (CDC), biosafety is the “application of safety precautions that reduce a laboratorian’s risk of exposure to a potentially infectious microbe and limit contamination of the work environment and, ultimately, the community”.[29] Moreover, biosafety in the laboratory is a concise set of practical guidelines for handling and disposing of biohazardous material.

85. The Bangladesh Biosafety Rules (BR) 2012, promulgated under the Environment Conservation Act 1995, govern the biosafety in Bangladesh. These rules codify the regulatory structures and processes contained in the Biosafety Guidelines of Bangladesh 2008. BR 2012 provides the regulations on the approval process for genetically engineered (GE) products developed domestically or by a third country and requires that all GE products need to be approved before they can be imported or sold domestically within Bangladesh.

[29] Centers for Disease Control and Prevention. Quick Learn Lesson, Recognizing the Biosafety Levels. https://www.cdc.gov/training/quicklearns/biosafety/.

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86. The Biosafety Guidelines 2008 are applicable to all research and development activities of modern biotechnology as defined in the Cartagena Protocol on Biosafety conducted in laboratories of the government research institutes, state enterprises, universities, international organizations located in Bangladesh, private companies or non-governmental organizations.[30] In September 2019, the Bangladesh Biosafety and Biosecurity Society published the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials to establish and to ensure the adequate biorisk assessment, containment, handling, transport, and disposal of biohazardous materials used in various diagnostics and research purposes in Bangladesh.[31] BAU will prepare the laboratory biosafety manual and the biosecurity plan for BICAR based on the requirements of Bangladesh regulations and aligned with international best practices.

87. Based on the Bangladesh Biosafety Guidelines 2008 and the CDC Biosafety in Microbiological and Biomedical Laboratories (6th Ed. 2020), the following defines the four levels of biosafety:

> *Biosafety Level 1* (BSL 1) is suitable for work involving agents of no known or minimal potential hazard to laboratory personnel and environment. The laboratory is not separated from the general traffic patterns in the building.
>
> *BSL 2* is like BSL1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It differs in that (1) laboratory personnel are directed by experienced scientists, (2) access to the laboratory is limited when work is being conducted, and (3) certain procedures (in which infectious aerosols are created) are conducted in biological safety cabinets or other physical containment equipment.
>
> *BSL3* is applicable to clinical diagnosis, teaching, research, or production facilities where work is done with indigenous or exotic agents that may cause serious or potentially lethal diseases because of exposure by inhalation. Laboratory personnel have specific training in handling pathogenic and potentially lethal agents and are supervised by competent scientists who are experienced in working with these agents.
>
> *BSL4* is for work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections and life-threatening disease that are frequently fatal, for which there are no vaccines or treatments; members of the laboratory staff are to receive specific training in handling infectious agents. They should be supervised by competent scientists who are trained and experienced in working with specific agents.

88. There will be three biosafety laboratories in BICAR (Table 3.4) with an estimated cost of $9,202,190.

[30] Convention on Biological Diversity. Cartagena Protocol on Biosafety.

[31] Established in August 2011, the Bangladesh Biosafety and Biosecurity Society is a professional society to foster best and sustainable biosafety and biosecurity practices in Bangladesh considering the current situation of infectious diseases outbreaks and increasing demands for research and diagnostics of these disease-causing agents.

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Table III.4: Biosafety Laboratories in BICAR

Category	Building 1	Building 2	Building 3	Building 4	Another Compound
Purpose	Laboratory Building	Incubation Center	Admin & Common Facilities	Utility & Service Building	Animal Experimentation Facility
BSL 2	1,615 m^2	-	-	-	-
BSL 2+	-	-	-	-	1,737 m^2
BSL 3	183 m^2	-	-	-	-

Source: Project Feasibility Study November 2023.

89. The CDC Biosafety in Microbiological and Biomedical Laboratories (U.S. Department of Health and Human Services, 2011) or the Guidelines for Research Involving Recombinant DNA Molecules of the National Institutes of Health (2011), do not recognize BSL 2+ containment level. BSL 2+ refers to describe laboratories where work with microorganisms is conducted in a BSL 2 laboratory with biosafety practices and procedures typically found at BSL 3.[32] Creating a BSL 2+ laboratory means taking a smaller BSL 2 or "tissue culture" laboratory room and dedicating it to the project where limited access is allowed only to those persons who are listed on the research protocol and have received the necessary training. BSL 2+ may not always be appropriate for pathogens that are infectious via the inhalation route. As shown in Table 3.4, the animal experimentation facility will be designed as BSL 2+.

90. Design and construction of the laboratory building, and the animal experimentation facility will refer to the Bangladesh biosafety regulations and requirements. The EDCF recommends that the biosafety laboratory should be in line with the Cartagena Protocol and guidelines of the Government of Korea which is the *Integrated Notification of the Act on the Transfer of Genetic Variants between Countries* (Attachment 9-1) as follows:

1. Installation Criteria

Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
Laboratory Location and Access	Laboratory (Experimental Zone): Separated from General Zone	R	R	M	M
	Installation of main entrance lock system (card, fingerprint recognition system, security system, etc.)	R	R	M	M
	Installation of personal clothing and laboratory clothes storage before entering the laboratory	R	R	M	M
	Laboratory access: Installation via entrance, front room, etc.	-	R	M	M
	Installation of doors or areas for incoming and outgoing of equipment	-	R	M	M
	Installation of door mutual opening prevention devices in the area (manual operation possible)	-	-	M	M
	Entrance: Installation of doors capable of air expansion or compression sealing	-	-	R	M
	Installation of conditioning equipment near	-	-	R	M

[32] Duane, Elizabeth Gilman. A Practical Guide to Implementing a BSL-2+ Biosafety Program in a Research Laboratory. *Applied Biosafety*, Vol. 18, No. 1, 2013.

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	the enclosed area				
	Enclosed facilities: A separate experimental building surrounded by concrete walls (grade 4 research facilities reflect seismic design)	-	-	R	M
	Space for maintenance of research facilities		-	M	M
Experiment Section	Inside the enclosed area: Use of materials capable of chemical sterilization and fumigation	-	-	M	M
	Walls inside the enclosed area: Use materials that guarantee sealing, such as concrete.			R	M
	Joint in enclosed areas: Use of non-hardening sealants that allow complete enclose of facilities	-	-	M	M
	Installation of HEPA filter when installing vacuum pump lines supplied from outside	-	-	M	M
	Interior wall: Installation to avoid distortion or damage to pressure 1.25 times the set pressure during design	-	-	-	M
Air Adjustment	Air inside the enclosed area: always Maintain sound pressure and prevent recirculation	-	-	M	M
	Pressure difference between outside and maximum sound pressure zone: -24.5 Pa or more (±30% fluctuation allowed)	-	-	M	M
	Facility ventilation: at least ten times per hour (at least twenty times for level 4 research facilities)	-	-	M	M
	Installation of the air supply system in conjunction with the exhaust system	-	-	M	M
	Installation of HEPA filter in air supply duct (Mandatory for Animal zone)	-	-	R	M
	Installation of HEPA filters in exhaust ducts (In case of level 4 research facilities, installation of HEPA filters in two stages)	-	-	M	M
	Installation of spare exhaust filter box	-	-	R	M
	Installation back draft damper (BDD) in the exhaust duct			M	M
	Installation of airtight type damper at the front end of the exhaust HEPA filter (In case of level 4 research facilities, installation of bubble tight damper or comparable damper)	-	-	M	M
	Ducts and exhaust HEPA filter boxes at the front end of the exhaust HEPA filter: level 3 research facilities resist pressure of 1,000 Pa or more for 30 minutes (within 10% leakage), level 4 research facilities resist pressure of 2,500 Pa or more for 30 minutes (within 1% leakage).	-	-	M	M
Experimenter Safety Protection	Installation of hand sanitizers and eye cleaners (excluding eye cleaners for suit type level 4 research facilities) in the	-	R	M	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	experiment area or inside the laboratory				
	Installation of emergency shower facilities in enclosed areas (excluding suit type level 4 research facilities)	-	-	M	M
	Installation of a chemical shower device for removing contaminated laboratory clothes	-	-	-	M
	Installation of positive pressure suit and compressed air breathing apparatus (excluding cabinet type level 4 research facilities)	-	-	-	M
Experiment Equipment	Installation of high-pressure sterilizers (for research facilities of level 3 and 4, installation of double-door high-pressure sterilizers)	M	M	M	M
	Installation of a biosafety workstation	-	R	M	M
	Using a centrifuge with the ability to prevent aerosol from leaking to the outside	-	R	M	M
	Installation of breeding equipment including air supply and exhaust systems with HEPA filters when using animals (separate duct connection) (In case of level 4 research facilities, installation of HEPA filters in two stages)	-	R	M	M
Waste Disposal	Solid waste: Installation of equipment such as high-pressure steam sterilization or chemical treatment to remove biological activity	R	M	M	M
	Experimental wastewater: Installation of equipment that can remove biological activities such as high-pressure steam sterilization or chemical treatment (In the case of level 4 research facilities, installation of high-pressure steam sterilization equipment)	R	M	M	M
	Exhaust by HEPA filter (In case of level 4 research facilities, installation of HEPA filter in two stages)	-	R	M	M
Other facilities	Installation of communication equipment connected to the outside of the facility	R	R	M	M
	Installation of backflow prevention devices in piping	-	R	M	M
	Installation of nozzles for the detoxification and test of HEPA filter	-	-	M	M
	Installation of observable internal pressure measuring instruments and alarms	-	-	M	M
	Installation of spare power supply facilities for air conditioning and essential facilities in case of power outages	-	-	M	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	Installation of carbon filters in exhausts in areas where odors may occur a lot, such as animal testing areas	-	R	M	M

Source: DPP May 2024.

2. Operating Standards

Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
Access to Experiment Area	Laboratory doors are always closed, and only authorized access is allowed.	R	M	M	M
	Keeping and recording the access list	-	R	M	M
	Equip and use of protective equipment such as laboratory clothes	R	R	M	M
	Attach a biosafety sign (name of genetically modified organism, safety management level, name and contact information of facility manager, etc.) in front of the entrance.	R	M	M	M
Activities in Experimental Area	Conduct experiments only in designated areas and wash hands after completion or when leaving the laboratory	M	M	M	M
	Wear a lab coat in the experimental area and take off the lab coat when moving to the general area.	R	M	M	M
	Using mechanical pipettes during experiment	M	M	M	M
	Minimize aerosol generation during experiments	R	M	M	M
	Prohibition of food intake, food preservation, smoking, and makeup in the experimental area	M	M	M	M
	Prohibition of bringing non-experimental items such as plants, animals, clothes in the experimental area	R	M	M	M
	When transporting infectious substances, convey them in a tightly sealed container.	-	R	M	M
	Prepare management measures for insects and rodents	M	M	M	M
	Disinfect the workstation after the experiment (disinfect immediately if contamination occurs during the experiment)	-	M	M	M
	Remove lab coat and remove contamination with shower when leaving the laboratory	-	-	R	M
Securing Bio Safety	Place of storage of genetically modified organisms (refrigerator, freezer, etc.): Attachment of "Biohazard" mark.	M	M	M	M
	Organization of the Biosafety Committee and Nomination of a Director of Biosafety Management	R	M	M	M
	Designation of biosafety manager	R	R	M	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	Implementation and completion of biosafety education	R	M	M	M
	Management and maintenance of records related to the installation and operation of research facilities	M	M	M	M
	Preparation and storage of GMO storage management ledger	M	M	M	M
	Recording, reporting, and keeping records of experimental infections	-	R	M	M
	Preparation and application of biosafety management regulations (In case of level 3, 4 research facilities, prepare facility operation rules)	R	M	M	M
	Opening of items containing infectious substances: Performed on physically enclosed equipment such as biological safety workstations	-	R	M	M
	Collection and storage of normal serum for test and research workers (periodic serum collection and medical examination if necessary)	-	R	M	M
	Inoculate if vaccine is available for handling pathogens	-	R	M	M
Waste Disposal	Contaminated waste before treatment: store in a separate safe place or container	R	M	M	M
	Disposal of all waste (including straw) by eliminating biological activity	R	M	M	M
	Establishment of regulations on the disposal of experimental waste	M	M	M	M

Source: DPP April 2024.

91. **Floor Height Requirement for BSL Facilities**. The following floor heights will be followed:

(i) Except for the ground floor and the top floor, all floor heights will be 12 feet (ft) - high
(ii) BSL 3 zones in the top floor will be 15 ft (or 4.572 meter) while BSL 1 and BSL 2 will have a floor height of 12 ft (or 3.66 meter).
(iii) Two rooms under the vaccine laboratory will be BSL 3 and will require a minimum of 9 ft (or 2.74 meter) and additional space of 6 ft (or 1.83 meter) to accommodate for the HEPA filter replacement to ensure a healthy and safety building consistent to the international good practices in Korea.

78. Floor height requirement for BSL 3 is part of the implementation of the Cartagena Protocol and the guidelines for the installation and verification of research facilities were designated by the Korean government.

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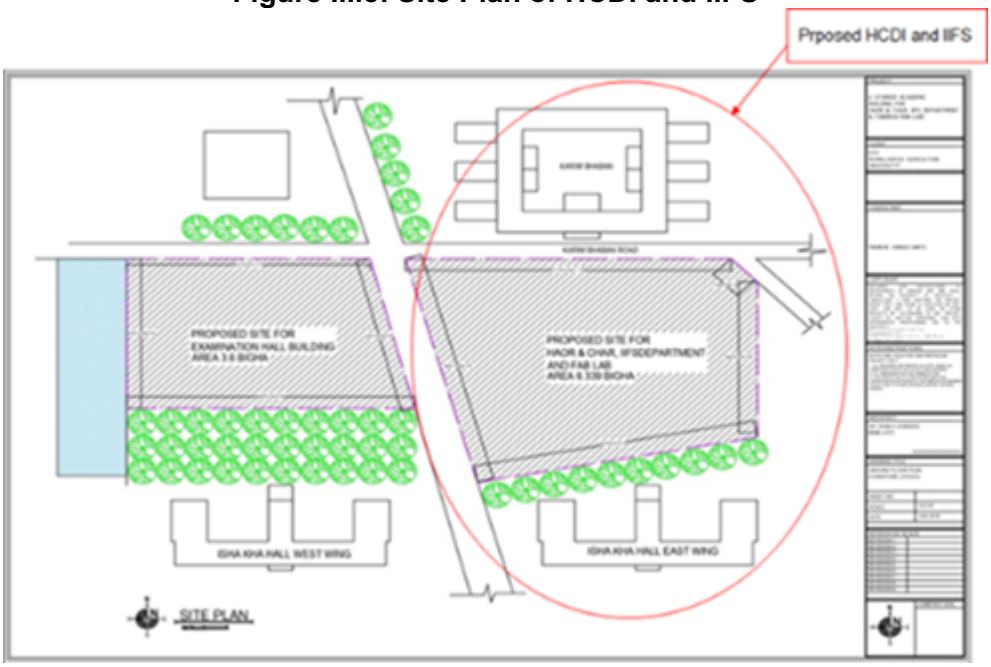
E. Construction of a New Building for HCDI and IIFS

79. The proposed site for the new building is about 0.4272 ha in front of the Karim Bhaban, one of the oldest buildings in BAU. The location is bounded in the north by Karim Baban, in the south by the Isha Kha Hall, a student dormitory/hall and the Isha Kha Hall Mosque, in the west by a road connecting to the main BAU campus, and farther east, by a stretch of the Old Brahmaputra River. Also, farther on the west side of the project site is the Vaccine Production Centre. The estimated cost for the new building is $10.015 million. Figure 3.4 shows the proposed site of the new building for the HCDI and IIFS while Figure 5 shows the site layout.

Figure III.4: Proposed Site of HCDI and IIFS Building



Figure III.5: Site Plan of HCDI and IIFS



a. Haor and Char Development Institute (HCDI)

80. The establishment of the new HCDI aims to achieve the following:

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(i) Introduce a course on cropping pattern and farm management or similar topic to be able to give an accurate idea about Haor and Char agriculture;
(ii) Aid in achieving family food security through multipurpose food production, use and nutrition improvement, human resources, development, and awarding degrees in Haor Agricultural subject through master's and PhD research;
(iii) Provide consultancy support in the dissemination of appropriate technology, commercialization of agriculture and poverty alleviation, supply inputs of sustainable technology to increase income, and to create employment of farmers, poverty-stricken men, and women; and,
(iv) Create sub-stations that will work as connection among farmers of Haor and Char and researchers, communicate among universities, research institutes, agricultural extension, rural development organizations and NGOs on innovations of research technology and its dissemination.

81. **Need for a new HCDI.** The Haor area covers 57 upazilas in the northeastern part of Bangladesh located in Kishoreganj, Habiganj, Netrakona, Sylhet, Moulvibazar and Habiganj with a total area of about 8,000 square kilometer (km^2) representing approximately 5.4% of Bangladesh. A haor is a back swamp or bowl-shaped depression, between the natural levees of a river, a flat basin that holds water for about six months of the year and the remaining six months being cultivated with river water and remains at the floor level of Haor. About 19.37 million people live in the Haor area. HCDI started in March 2017 and BAU has more than three decades of experience in continuous research and technology development and local expansion, and livelihood development of farmers in the agricultural environment of Haor. To provide an improved support to the farmers, BAU recognized the need for a new institute in pioneering research on Haor and Char as well as related scientific and socioeconomic structures.

b. Interdisciplinary Institute of Food Security (IIFS)

82. The objectives of the new IIFS are (i) to increase the facilities for proper conduct of basic agricultural and practical education and research support activities for a secure and safe food; and (ii) to increase the infrastructure for the smooth conduct of educational programs for students studying honors and master's degree in IIFS.

83. **The need for a new IIFS**. Agriculture is one of the drivers of the national economy and will continue to be so in realizing the Vision 2041 of the government. Thus, there will be a demand for agriculture-based human resources with proper knowledge, skills, and quality on food production. There is a need to develop new technologies and techniques in agriculture through fundamental and applied research to be adapted in the field by way of various training and extension programs.

C. Codes and Practices for Design

84. The following codes in structural design of the new buildings will be guided by BNBC 2020, American Concrete institute (ACI 318 2008), American Society of Civil Engineers (ASCE7-05). The American Concrete Institute (ACI 318, 2008) will guide the reinforced concrete design and for loading criteria, the ASCE/SE7-0 code may be referred to as and when necessary, to complement the BNBC 2020.

85. Computer software for building design that may be used for analysis may include ETABS, an integrated engineering software package for structural analysis and design of

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buildings; STAAD PRO, a popular structural analysis application known for advanced analysis, diverse applications of use, interoperability, and time-saving capabilities; and SAP 2000, general purpose civil-engineering software for the analysis and design of any type of structural system. For foundation safety, Plaxis 3D may be used. It is software for 3D deformation and stability analysis of non-linear soil/rock behavior and complex structures.

d. Construction Materials

86. The construction of the new building will require materials of various types and quantities. The following will be considered:

- Site Development - to be done by locally available earth and sand material.
- Concrete aggregate - stone aggregates are commonly used for the manufacture of normal and high strength concrete and is proposed to be used for these structures.
- Cement and steel reinforcement - Bangladesh produces different classes of EN (Euro Norm) and American Society for Testing Materials (ASTM) standard cement and high strength deformed bar of 40, 60 and 72.5 grades.

e. Design Considerations

87. The new building for HCDI and IIFS will consist of six floors covering a total construction area of about 23,780 m^2. Each institute will be designed based on the program of BAU which includes classroom facilities, laboratories, library, common room, IT labs, training facilities, office of department head, and faculty rooms.

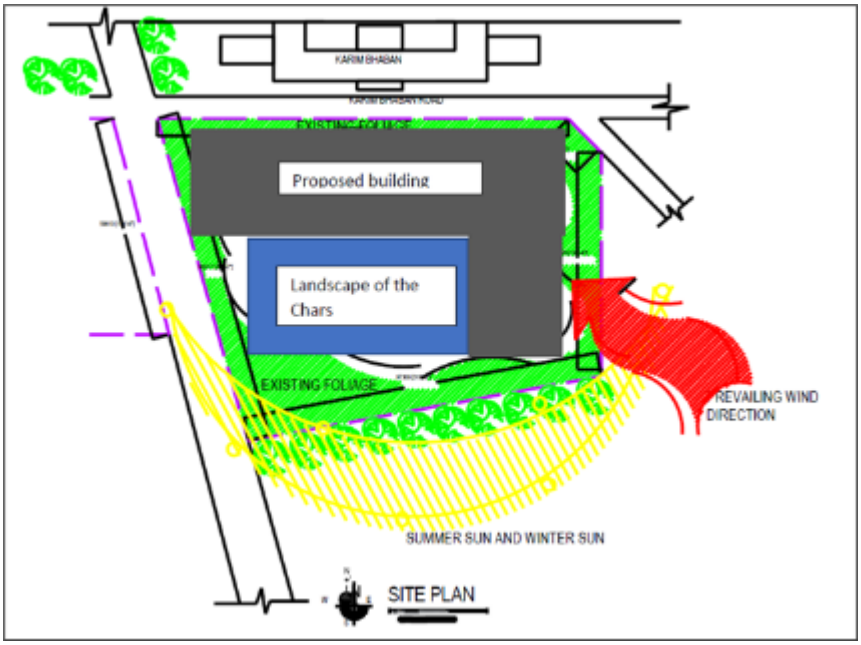
88. **Orientation of the site.** Considering the sun angle and prevailing wind direction of the site, the proposed building is elongated in a north–south direction giving very limited exposure of the west sun resulting to cooler effect.

89. **Orientation of the structure.** The new building is elongated from north to south. All services will be located on the east side of the building to block the direct solar radiation heat gain into the habitable areas. A water body is proposed on the southern side of the site as well as in the building to catch the maximum prevailing wind and act as an evaporative cooling pond. At the same time, it is intended to showcase the unique landscape display - an array of flora and fauna of the chars and haors. Figure 3.6 shows the prevailing wind direction and the summer- winter sun position in the proposed site.

90. **Design principles.** Includes the following: (i) structural module for the building is derived from the standard classroom size for 60 students, (ii) the same module is used interchangeably for deriving laboratory sizes, (iii) the modular grid size would offer more flexibility in altering and modification as well as extension of a function to the next grid, (iv) the generic modular approach to the laboratory planning to allow for different layouts and equipment arrangements to suit each division's needs, (v) the laboratory space allows for segmentation of laboratory area for specific use, (vi) all rooms are naturally ventilated, (vii) daylight maximized for optimum use of artificial light, and (viii) stack effect used for ventilation.

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Figure III.6: Wind direction and sun position in the Proposed HCDI and IIFS Site



91. **Green design concepts.** The central circulation bay is designed to accommodate a vestibule of solar panels. The panel is expected to mitigate the lighting load requirements of the common areas. Other green design approaches are: (i) environment-friendly climate proof design, (ii) use of environment-friendly building materials, (iii) extend facilities to use natural resource such as natural light, air, ventilation, water, etc., (iv) ensure natural lighting and ventilation, (v) use of renewable energy, and (vii) sustainable waste management. Environment-friendly building materials will be considered in selecting for bricks, wood, recycled plastics, ashcrete, low VOC (volatile organic compound) paint, etc.

92. Figure 3.7 presents the perspective view of the new building for the HCDI and IIFS while Appendix 1 presents the conceptual floor plan and floor distribution.

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Figure III.7: Perspective View of the HCDI and IIFS Building



93. The design concept for the new buildings will be further developed in the detailed engineering design (DED) during project implementation. DED will consider the appropriate land development of the project site, water conservation, energy efficiency, incorporate the green building features, use of environment-friendly construction material and equipment, and design approaches that cover persons with disabilities and childcare. This IEE will be updated based on the latest design and mitigation measures. The updated IEE will be disclosed in the ADB website and the BAU project web page.

F. Refurbishment and Renovation of Selected BAU Existing Buildings

94. Scope of renovation/refurbishment of existing educational facilities will be mainly on the classrooms and common facilities which will include women- and disability-friendly facilities. This will involve separate toilets, separate prayer rooms, study, and rest areas, childcare facilities, and easy access for people with disability for all faculties. Table 3.5 lists the total of 17 existing buildings that will be included in the refurbishment and renovation.

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Table III.5: Selected Existing Buildings for Refurbishment and Renovation

No.	Name
1	Faculty of Agricultural Economics and Rural Development- Faculty Building
2	Faculty of Animal Husbandry (Main building)
3	Gymnasium
4	Dean Building/ Kazi Fazlur Rahman Bhaban
5	Library, Bangladesh Agricultural University
6	Faculty of Veterinary Science- Building 1
7	Faculty of Veterinary Science- Building 2
8	Faculty of Veterinary Science- Building 3
9	Faculty of Agriculture Engineering and Technology- Dean Building
10	Faculty of Agriculture Engineering and Technology- Faculty Building
11	Department of Agriculture Extension Education (DAEE)
12	Agriculture Faculty- East Building
13	Agriculture Faculty- West Building
14	Department of Agroforestry
15	Auditorium
16	Faculty of Fisheries- Dean Building/Prof. Aminul Haque Bhaban
17	Faculty of Fisheries-Faculty Building

95. Table 3.6 shows the details and total cost estimates of the scope of refurbishment and renovation which is about $9.82 million. The cost covers the civil and electrical works, sanitary works of various classrooms, auditorium, library, sports facilities. Figure 3.8 shows the location of the existing buildings.

Table III.6: Cost Estimates of Refurbishment and Renovation of BAU Facilities

No.	Particulars	Unit	Quantity	Rate (BDT Lakh)	Amount (BDT Lakh)
1	Classroom and Gallery • Physical condition upgrading including new paint, repair and damp removing and improving floor condition • Improved teaching facility with projection/TV and sound system and acoustic control • Improved climate control system/ better ventilation system • Improved lighting with new electrical wiring and system (individual classroom) • Modernization of existing classroom facilities	Number	50	120	6,000.00
2	Building facility improvement including building accessibility (universal accessibility for disabled people) • Female common area upgradation, • Teachers' designated area renovation • Waste management system • Solar reflective index paint (heat-reducing paint- heat reflective roof paint) • Minor electrical retrofit • Tree plantation and landscaping	Buildings	17	32.50	552.50
3	Existing Toilet Improvement • Renovation of existing toilets • Male-female segregation	Number	88	2.75	242.00

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No.	Particulars	Unit	Quantity	Rate (BDT Lakh)	Amount (BDT Lakh)
	• New toilet with low water consumption faucet and flush system				
4	Library renovation for enhanced learning environment • Better interior environment • Acoustic control reduce noise • Direct lighting from roof and from table • Modernization of existing library facilities • Building retrofit/damage repair	Number	1	1,000	1,000
5	Gymnasium and other sporting facilities • Renovation and repair of existing building • Replace old exhaust system for better air ventilation system, • Movable semi-partitioning between indoor sports • Lighting in activity area, • Small gallery • Renovation and repair of gymnasium area	Number	1	505.50	505.50
6	Shilpacharya Zainul Abedin Auditorium • Renovation and repair of existing building • Central air conditioning system • Acoustic solution • Floor, stage, greenroom and seating area modernization • False and decorative ceiling (acoustic quality) • Wall Paneling (acoustic quality) • Lighting and firefighting system	Number	1	2,500	2,500
	TOTAL				**10,800.00 (or about $9.82 million)**

Source: DPP April 2024.

Figure III.8: Location of Existing Buildings for Renovation/Refurbishment



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G. Installation of Solar Rooftop Panels

96. Consistent to the solar rooftop directives of the government, the new buildings of BICAR and the HCDI and IIFS will include the installation of solar rooftop PV panels.[33] An estimated cost of about $818,200 (or BDT 900 lakh) is included in the budget for refurbishment/renovation of the 17 selected existing academic facilities and about $54,545 (or BDT 60 lakh) is allocated for the new HCDI and IIFS building.

97. The potential available space for the installation of the solar rooftop PV panels in BICAR is 3,387.58 m^2 and 4,237 m^2 for HCDI and IIFS. A conservative estimate of the potential solar energy that can be generated from the available space in the new buildings was based on the following parameters:

(i) Global photovoltaic power potential in Bangladesh – global horizontal irradiance (GHI) in Mymensingh is about 4.5 kWh/m^2/day (1,643 kWh/m^2)[34]
(ii) 60% of the available space will be used for solar rooftop panels – about 2,027.15 m^2 for BICAR and 2,542.41 m^2 for HCDI and IIFS[35]
(iii) Derate factor for converting direct current to alternating current – 0.75[36]
(iv) Roof cover ratio – 0.85 (Footnote 38, p.5)
(v) Photovoltaic module - peak power output of at least 350 Wp[38]
(vi) Solaria PowerXT 350R-PD 350W Solar Panel (60 cell PV module) – 1.621 m x 1.116 m x 0.04 m[39]

98. Based on the above parameters, the estimated capacity of solar energy that can be generated from the solar rooftop of BICAR is about 410 MWh per year and about 514.74 MWh from HCDI and IIFS. Installing solar rooftop PV panels is expected to contribute to the generation of green and clean energy for BAU consumption. A net-metered solar power system will be considered during the detailed engineering design to allow for surplus energy to be supplied to the national grid thus generating income for BAU. A typical grid-tied solar rooftop PV system is shown in Figure 3.9.

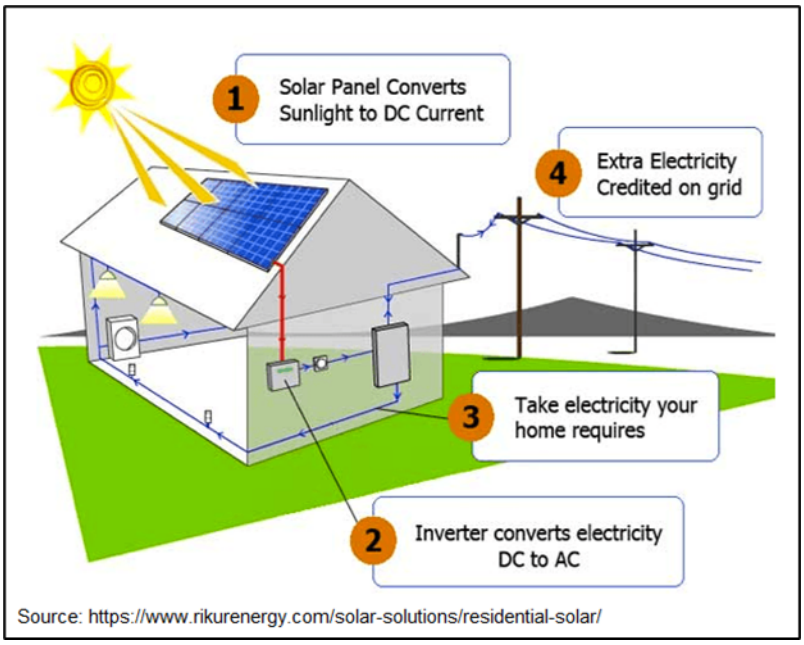
99. Applicable technical standards from the International Electrotechnical Commission (IEC), Underwriters Laboratories Inc, (UL), and the Institute of Electrical and Electronics Engineers (IEEE) will be referred to in the design and selection of the PV system. The Sustainable and Renewable Energy Development Authority (SREDA) requires that imported PV modules must meet the standards such as IEC 61215:2016, 60904-1:2013, 60904-2:2013 and 60904-9:2013 for solar modules, IEC 62109-1:2016 and 62109-2:2016 for inverters, and IEC 62509:2016 for charge controllers.

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33 Ministry of Power, Energy and Mineral Resources. Circular on Installation of Net-metered Rooftop Solar for New Electricity Connection. 23 August 2023. For educational institutions, hospitals, and charitable organizations with at least 1,000 ft^2 (or about 92.9 m^2) of rooftop space, net-metered solar power systems are required; single-phase connections must install a net-metered solar system with a minimum capacity of 1 kW while those requiring three-phase connections must meet a 3-kW capacity.
34 World Bank. Global Photovoltaic Power Potential by Country.
35 The 60% was used for ADB Loan 4348-BAN: Improving Computer and Software Engineering Tertiary Education Project approved on 21 September 2023. This can be revised/updated during the detailed engineering design for SATEP.
36 ADB. Handbook for Rooftop Solar Development in Asia. 2014.
38 Infrastructure Development Company Limited. Technical Standard for IDCOL Solar Roof-top Projects.
39 Solar Electric Supply, Inc.

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Figure III.9: Grid-tied Solar Rooftop PV System



H. Procurement of Goods, Furniture and Equipment for BICAR

100. Output 3 (Agricultural research and development strengthened) will support the procurement of goods, furniture, and equipment for seven specialized laboratories at the BICAR of BAU. The seven laboratories are (i) imaging laboratory, (ii) climate-smart precision agriculture and modeling laboratory, (iii) analytical laboratory, (iv) post-harvest technology and food processing laboratory, (v) food safety laboratory, (vi) genomics & bioinformatics laboratory and (vii) diagnostics and vaccines laboratory. Civil works for BICAR will be financed by the Economic Development Cooperation Fund (EDCF) of the Export-Import Bank of Korea.

101. ADB has identified procurement as one of the key functions in supporting and promoting the sustainability of their sovereign operations and commitment to the Paris Agreement. [40] In December 2021, ADB issued a Guidance Note on Sustainable Procurement.[41]

102. At the national level, the government has a draft Sustainable Public Procurement Policy (January 2023) under the Ministry of Planning which, among others, *"places the responsibility to all public sector organizations to consider, before the procurement process starts, the economic, environmental and social benefits of procuring goods and services"* for contracts likely to have significant sustainability impact. [42] Procurement will refer to the guidance note of ADB and requirements of the government. Procurement will also refer to Energy Star-certified products.[43]

I. Proposed Financing Plans

103. Table 3.7 gives the summary of the indicative financing plan. ADB will finance $120 million for expenditures related to civil works, equipment, consulting services and non-

[40] ADB. 2023. Sustainable Procurement.
[41] ADB. 2021. Sustainable Public Procurement.
[42] Ministry of Planning. Bangladesh. Draft Sustainable Public Procurement Policy of Bangladesh.
[43] Energy Star Product Finder.

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consulting services. The government will provide funds for consumables and materials as well as tax and duties estimated to cost $28.7 million. The EDCF of the Export-Import Bank of Korea will provide collaborative cofinancing[44] (not administered by ADB) of $61.3 million to construct a BICAR building.

Table III.7: Indicative Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (Concessional loan)	120.0	57.1
Economic Development Cooperation Fund		
Concessional loan	61.3	29.2
Government	28.7	13.7
Total	**210.0**	**100.0**

Source: Asian Development Bank estimates.

J. Implementation Arrangements

104. SHED, under MOE acting through UGC will be the EA and BAU will be the main project IA. A PMU will be responsible for the overall management of the project. Figure 3.10 presents the implementation arrangements.

105. **Project Steering Committee (PSC).** A PSC will be created and chaired by the Secretary of SHED who will oversee project implementation. PSC will invite representatives from the private sector and other stakeholders to better align with the needs of employers. The PSC will be responsible for (i) project policy direction and formulation; (ii) formulation of high-level institutional policy framework and policy guidelines for implementation; (iii) acceleration and follow-up of decision-making processes at relevant universities; (iv) review the project progress on a regular basis; (v) addressing critical inter-ministerial policy and implementation issues; and (vi) review the viability of the recommendations of reports and studies carried out. The PSC will hold quarterly/semi-annual/annual meetings. PSC may also meet as and when required to discuss matters relating to project implementation.

106. **Project Management Unit (PMU).** The PMU will be set up in BAU and will be headed by a full-time Project Director (PD) to provide the required technical, administrative, and logistic support for project implementation. The PD will be at least Additional Secretary level officer and have project management experience preferably related to tertiary education. SHED of MOE will appoint the PD who will implement the project activities under the guidance of the VC. Aside from the PD, there will be four Deputy Project Directors (DPD), five Assistant Project Directors, one accountant, and 12 support staff. The PMU will prepare and submit the quarterly progress reports and the semi-annual environmental monitoring reports to ADB, EDCF and the DOE.

107. The PMU will engage an environment specialist (national consultant) for 12 person-months intermittently during the construction phase (about 2 years) until the occupancy of the new buildings to provide technical support on the compliance to the environmental requirements of ADB according to SPS 2009, the relevant building construction, and the environmental requirements of the government. The environment specialist should have a working experience in environmental assessment, compliance monitoring of environmental

[44] ADB. 2016. ADB-ADCF Cofinancing Guide. Under collaborative cofinancing, this form of cofinancing imposes no contractual obligations on either ADB or the financing partner. Financing partner follows its own policies and procedures in implementing the assigned project component(s).

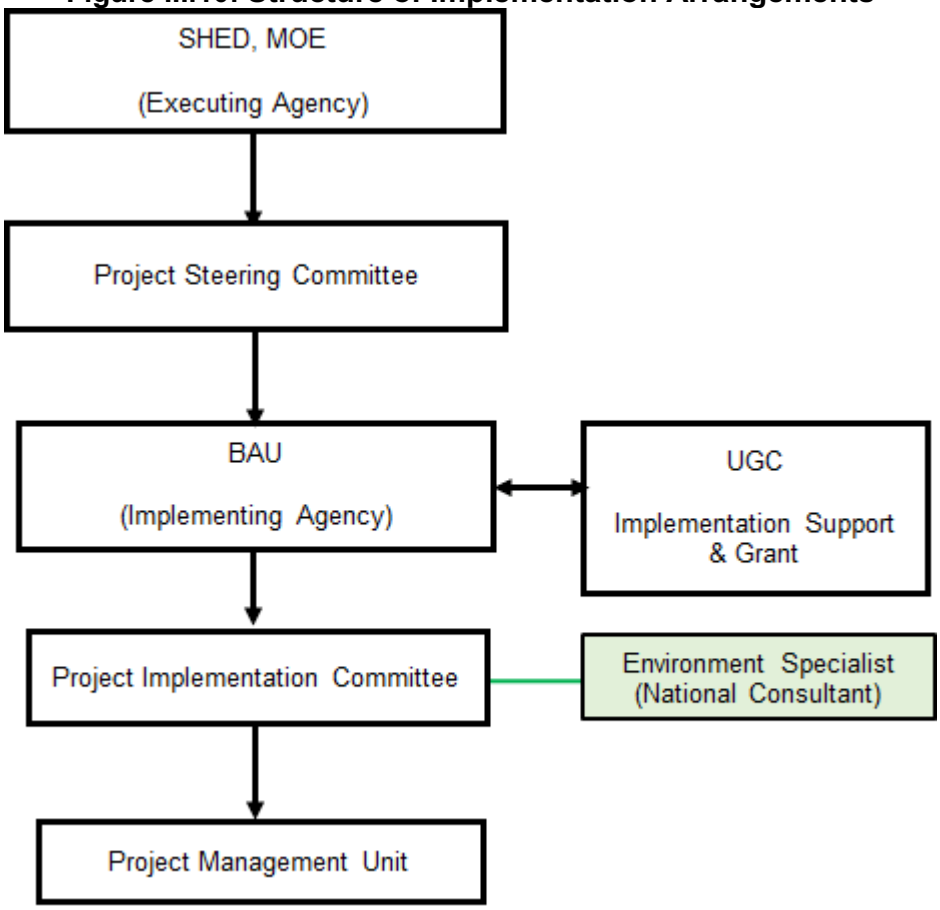
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requirements in health and safety (both occupational and community). During post-construction, BAU will designate a focal person to oversee environmental health and safety (EHS) issues related to the project until the project completion report has been submitted and cleared by ADB. Figure 3.11 presents the structure of the PMU.

108. **Project Implementation Committee (PIC)**. As required by the Bangladesh Planning Commission, a PIC will be formed headed by the BAU vice chancellor to (i) give guidance and assistance to PMU; (ii) review the progress of implementation; (iii) review key reports, (iv) review the budget utilization of AOP and ADP/RADP, and (v) support in resolving the implementation problem. PIC will meet at least once in every three months and may also meet as and when required to review the progress of project implementation.

109. **Implementation Schedule.** The project is expected to be implemented from to June 2029.

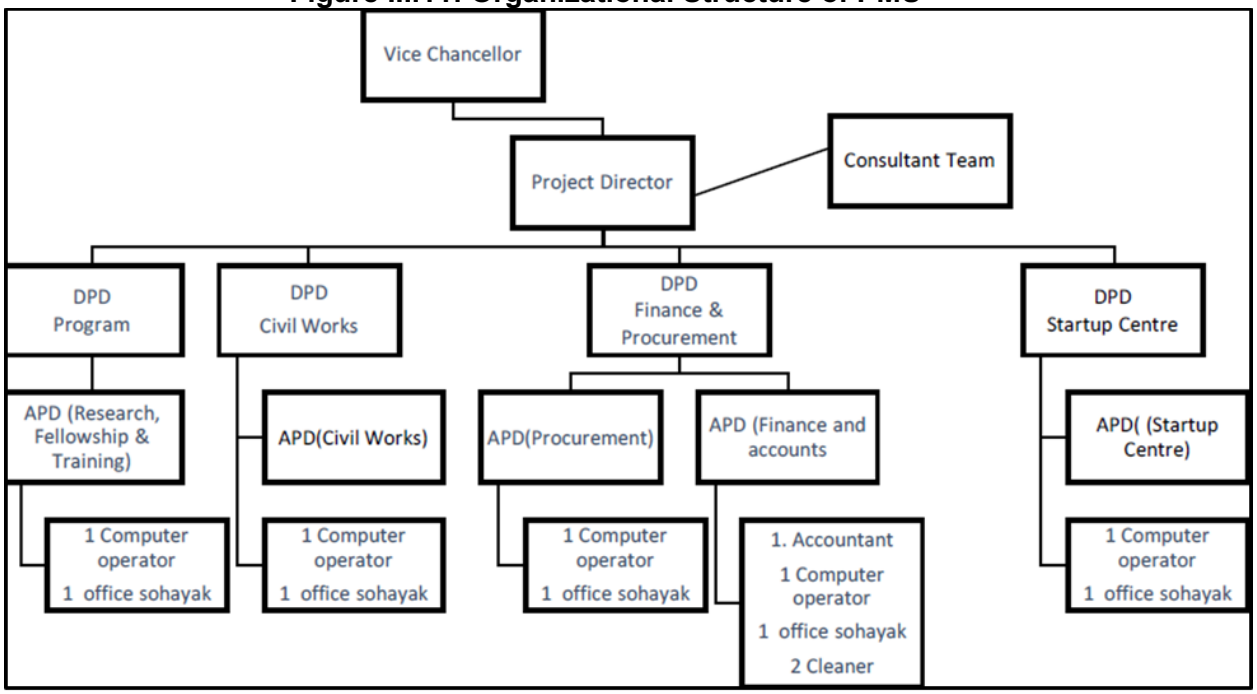
Figure III.10: Structure of Implementation Arrangements



Source: DPP April 2024

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Figure III.11: Organizational Structure of PMU



Source: DPP April 2024

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IV. DESCRIPTION OF THE ENVIRONMENT

A. Background and Brief Site Description

109. Of the four outputs of SATEP, Output 1 and Output 3 will involve civil works. Output 1 includes the construction of the new six-story building for HCDI and IIFS as well as renovation and refurbishment of 17 selected existing building such as the classroom, library, auditorium and sports facilities. The scope of renovation and refurbishment will include classrooms and common facilities to make them women- and disability-friendly through separate toilets, separate prayer rooms, study and rest areas, childcare facility, and easy access for people with disability for all faculties. Output 3 includes the construction of a new eight-story building for BICAR to be funded by EDCF while ADB will procure the equipment for the seven laboratories in BICAR.[45]

1. Project Area of Influence

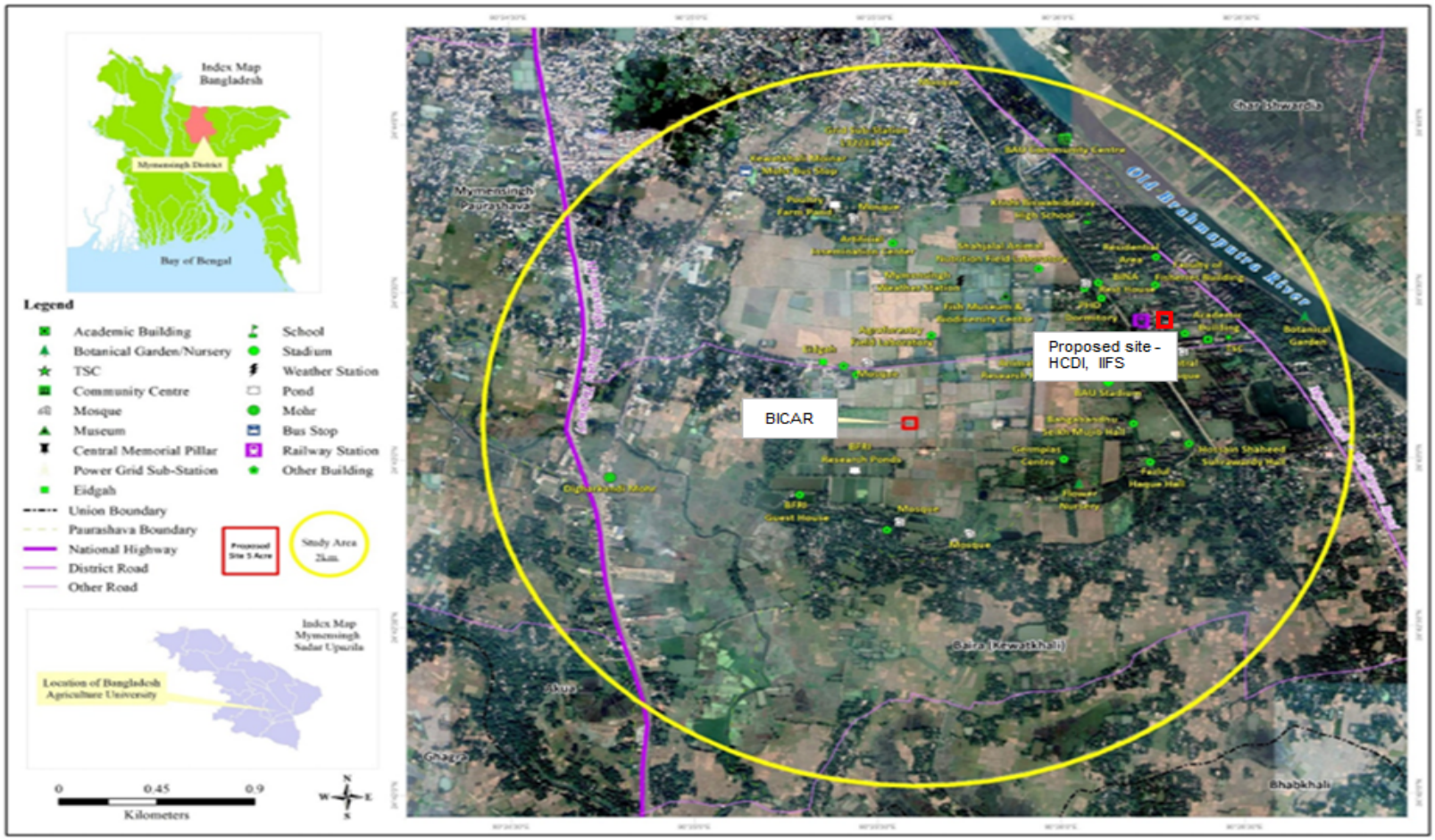
110. The proposed project area of influence (PAI) covers project site where the new building for HCDI and IIFS, and the new building for BICAR will be constructed and the study area is extended up to 2-km radius from the project site which includes the BAU campus, part of Mymensingh Pourashava area and the Old Brahmaputra River (Figure 4.1).

111. The project study was determined conservatively as 2-km radius considering the following factors: (i) the area to be directly and indirectly affected by project implementation particularly during the construction phase (transport of materials and people, site preparation, civil works, generation of dusts and noise, presence of workers' camp/temporary accommodation, etc.), (ii) extent of the surroundings in BAU with several facilities such as students' accommodation halls, guest house, mosques including the community living in the area and the means of their livelihood, and (iii) the characteristics of the existing environment in terms of air and water quality, noise, natural hazards, etc.

[45] The seven laboratories are (i) imaging laboratory, (ii) climate-smart precision agriculture and modeling laboratory, (iii) analytical laboratory, (iv) post-harvest technology and food processing laboratory, (v) food safety laboratory, (vi) genomics & bioinformatics laboratory and (vii) diagnostics and vaccines laboratory.

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Figure IV.1: Project Area of Influence



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2. Proposed Project Site

112. **BICAR.** The project site is a medium highland within BAU campus on the opposite side of the Bangladesh Fish Research Institute (BFRI) and currently utilized for rice seed production. The total area occupied by BAU is about 1,200 acres or 485.6 hectares (ha).[46] The proposed site for BICAR will require about 4.166 hectares (ha) to accommodate the four academic buildings and an animal experimentation facility. The project site is located within 3.5-4.0 km southeast from the Mymensingh District Headquarter (HQ) and 100 km north from Dhaka. The Old Brahmaputra River flows 1.5 km east from the project site and the site can be accessed through the eastern bypass of Mymensingh City. Important features within the close vicinity of the project site are:

- Bangladesh Institute of Nuclear Agriculture (BINA) HQ
- BFRI HQ, Guest House, and Mosque
- Germ-Plasm Center
- BAU Railway Station.

113. The selected site is currently urban agricultural land. It is approximately 6 feet lower than the existing road. The internal roads are well connected with the proposed location with other BAU facilities and fulfil the user end criteria for this research and incubation building. There is sufficient land surrounding the proposed project site to accommodate future horizontal expansion of the project and its supporting facilities. Figure 4.2 shows the location for BICAR while Figure 4.3 show the satellite image of the location.

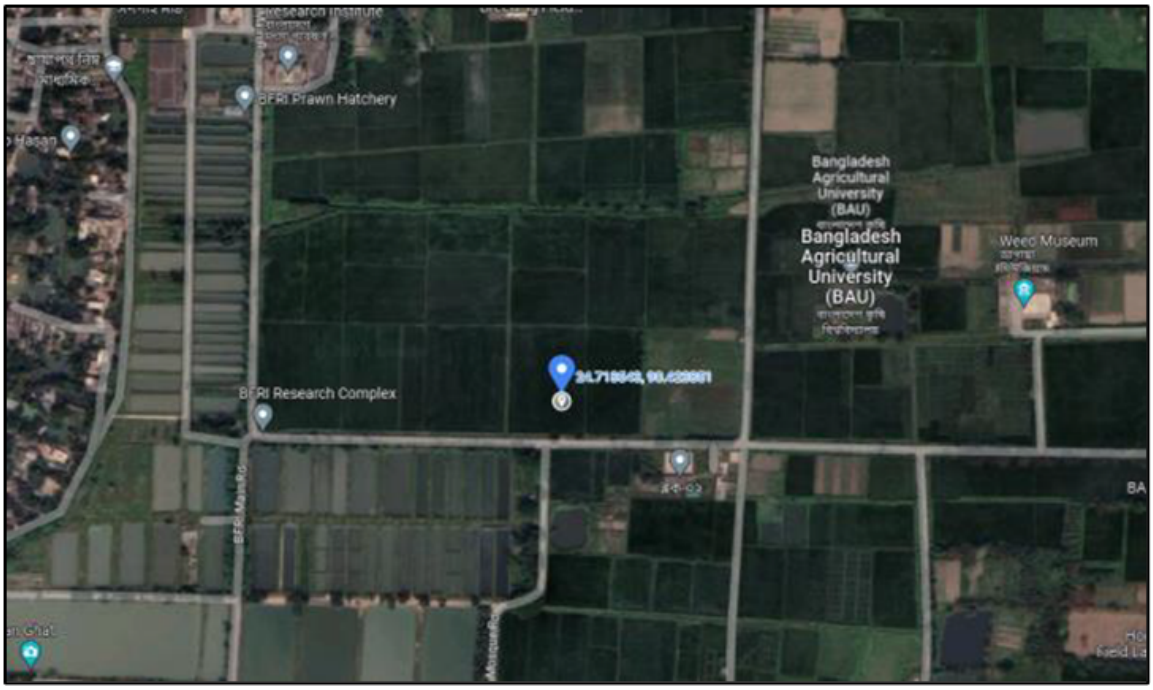
Figure IV.2: Proposed Site for BICAR



[46] Bangladesh Agricultural University. Location.

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Figure IV.3: Satellite Image of the Location of BICAR



114. **HCDI and IIFS.** The proposed site for the new building for HCDI and IIFS is in front of the Karim Bhaban, one of the oldest buildings in BAU. The location is bounded in the north by Karim Baban, in the south by the Isha Kha Hall, a student dormitory/hall and the Isha Kha Hall Mosque, in the west by a road connecting to the main BAU campus, and farther east, by a stretch of the Old Brahmaputra River. Also, farther on the west side of the project site is the Vaccine Production Centre. The total area that will be required for the six-story building is about 0.4272 ha. Figure 4.4 shows the location of the proposed site while Figure 4.5 presents the satellite footage of the site and existing vegetation.

Figure IV.4: Location Map of New Building for HCDI and IIFS



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Figure IV.5: Satellite Footage and Existing Vegetation, New Building Site for HCDI and IIFS



Source: Feasibility Study for Strengthening Agricultural Tertiary Education Project, April 2023

B. Physical Environment

115. The study area extends from the project site and the area within about 2-km radius from project site (Figure 4.1). Physical environment includes the climatic factors, noise, physiography, topography, and seismicity. The description of the physical environment within the PAI is presented in following sections.

116. Environmental baseline condition was established by collecting data from secondary sources followed by primary data collection from the study area. Secondary data sources included Bangladesh Meteorology Department (BMD), Bangladesh Bureau of Statistics (BBS), Bangladesh Water Development Board (BWDB), Soil Resources Development Institute (SRDI). Environmental quality measurements on air quality, noise level, surface water quality, and ground water quality were collected by the feasibility study consulting firm (Tranche Management Limited (TML) and SGS Bangladesh Limited (SGS)) from 13-17 November 2022.

1. Climate and Meteorology

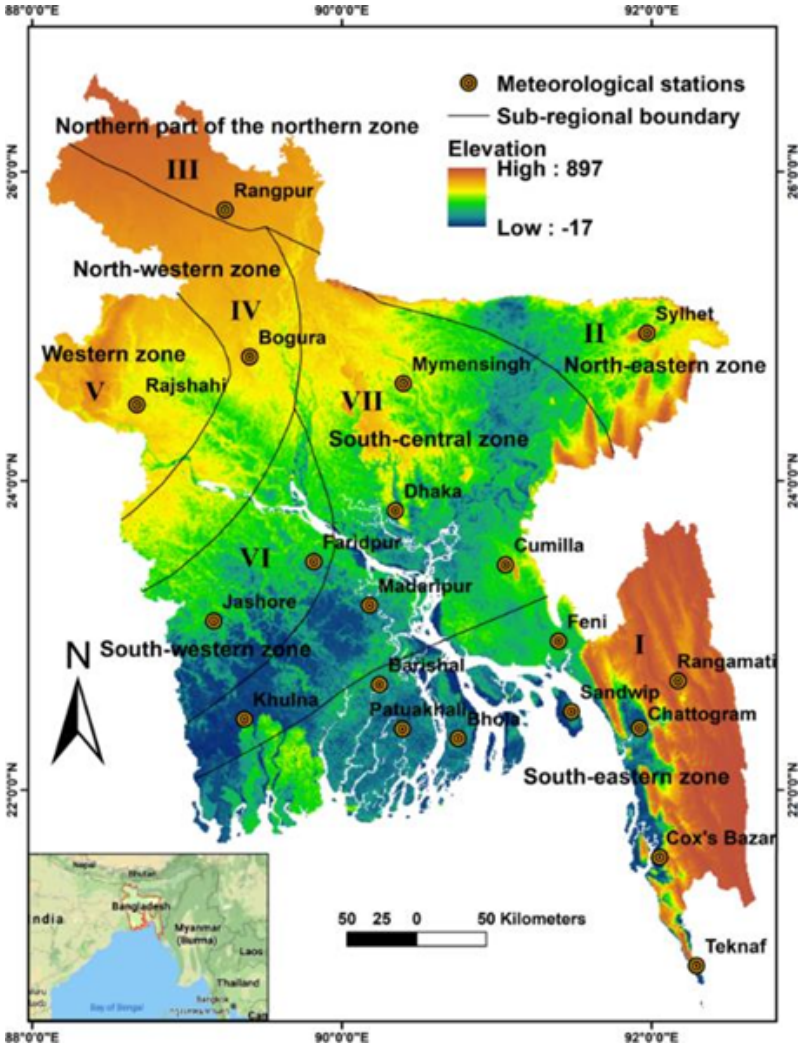
117. The climate of the study area is monsoon tropical. Different climatic parameters are described in below.

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2. Climatic Region

118. The Köppen climate classification system divides climate into five main groups: A (tropical), B (arid), C (temperate), D (continental), and E (polar). According to the climate characteristics, Bangladesh is divided into seven different climate sub-regions[47] such as (1) southeastern zone; (2) northeastern zone; (3) northern part of the northern zone; (4) northwestern zone; (5) western zone; (6) southwestern zone and (7) south-central zone (Figure 4.6).

Figure IV.6: Seven Climate Subregions of Bangladesh and Mymensingh

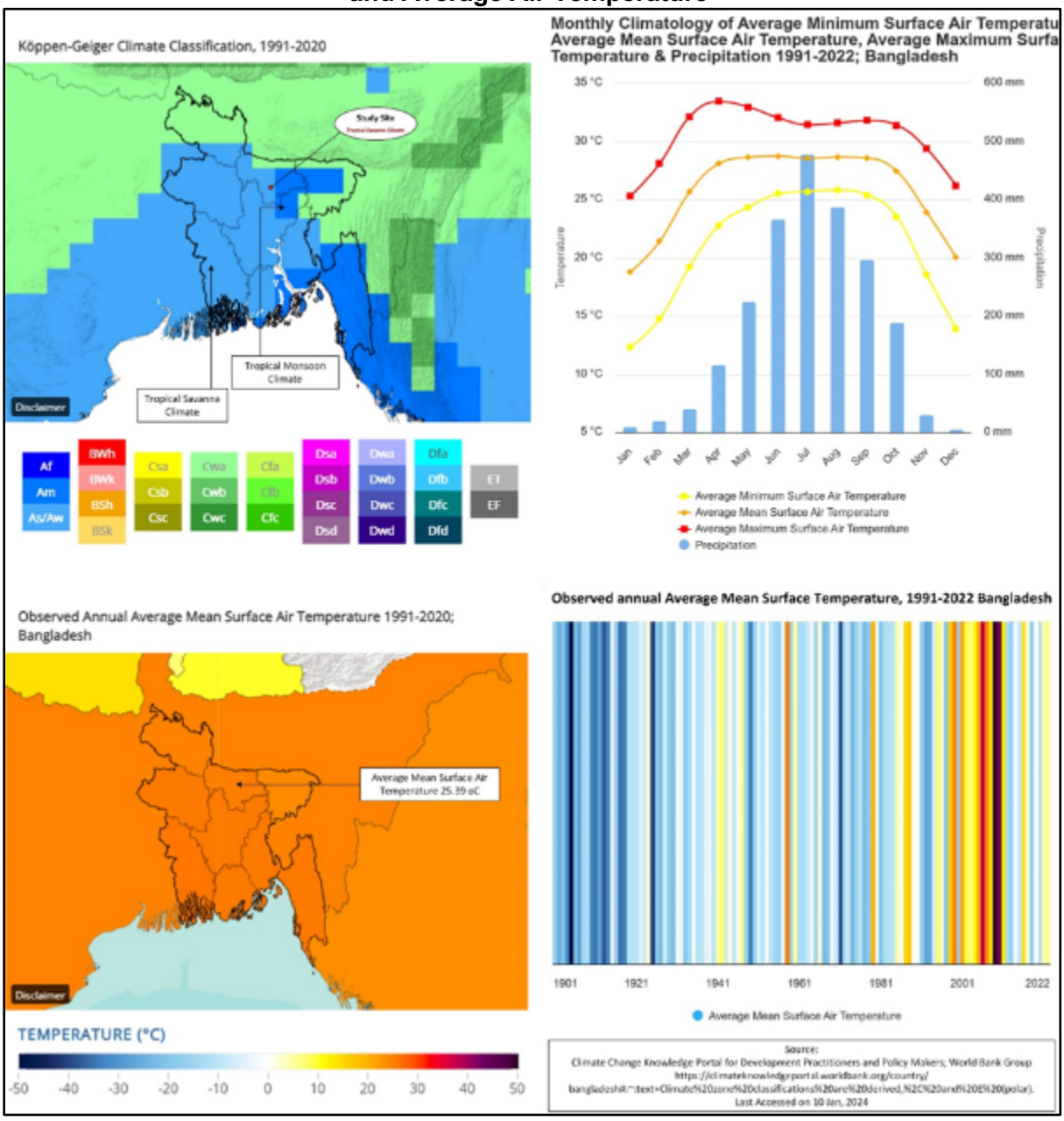


119. Based on the Köppen climate classification, Mymensingh falls under Aw category which is characterized by tropical wet and dry climate resulting to hot and humid summer and dry winter and the project study area falls south-central climatic zone of the country (Figure 4.7).

[47] Salam, R., Islam, A.R.M.T., Pham, Q.B. *et al.* The optimal alternative for quantifying reference evapotranspiration in climatic sub-regions of Bangladesh. *Sci Rep* 10, 20171 (2020).

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Figure IV.7: The Köppen-Geiger Climate Classification for Bangladesh with Monthly and Average Air Temperature



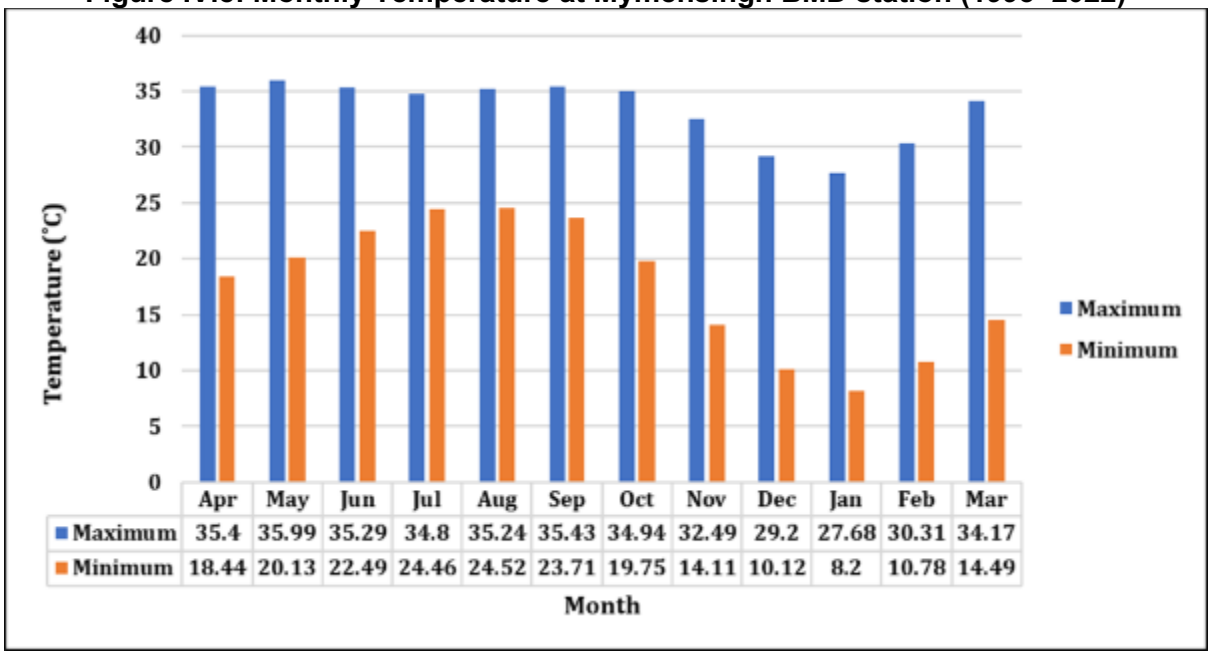
3. Climatological Information

120. Climatological information of the study area was collected from the BMD Mymensingh station which is the nearest station in the project area. Summary of the analysis of meteorological parameters are as follows:

121. **Temperature:** The monthly average temperature data of the last 30 years (1993–2022) shows that the maximum temperature varies from 27.68°C to 35.99°C and May is the warmest month while the minimum temperature varies from 8.2°C to 24.51°C and January is the coldest month. The monthly average of the maximum and minimum temperature from the Mymensingh station is shown in Figure 4.8.

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Figure IV.8: Monthly Temperature at Mymensingh BMD station (1993–2022)

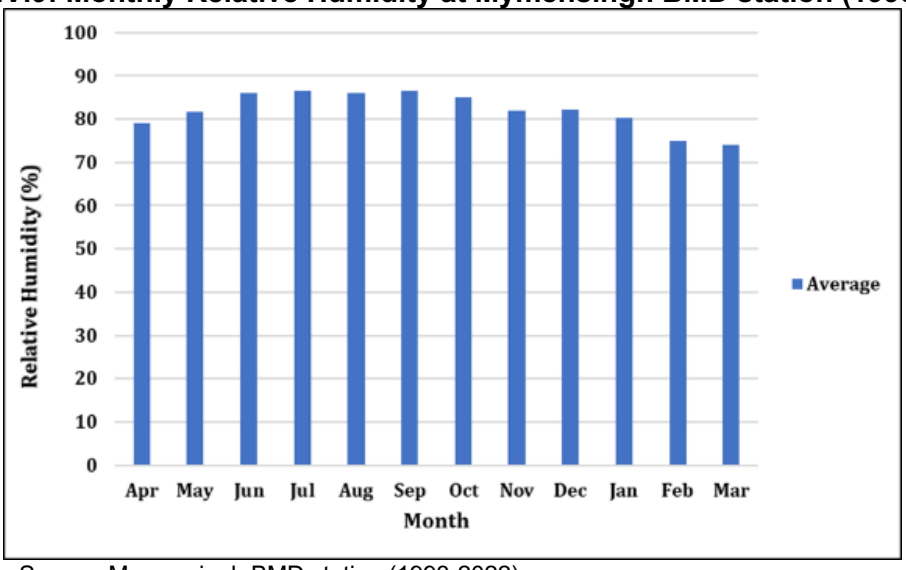


	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Maximum	35.4	35.99	35.29	34.8	35.24	35.43	34.94	32.49	29.2	27.68	30.31	34.17
Minimum	18.44	20.13	22.49	24.46	24.52	23.71	19.75	14.11	10.12	8.2	10.78	14.49

Source: Mymensingh BMD station (1993-2022).

122. **Relative humidity.** The analysis of the RH data from 1993 to 2022 indicates that the average RH varies seasonally from 74.07% in March to 86.53% in July. The most humid months are from July to September. The mean of monthly maximum and minimum RH of the above period is shown in Figure 4.9.

Figure IV.9: Monthly Relative Humidity at Mymensingh BMD station (1993–2022)

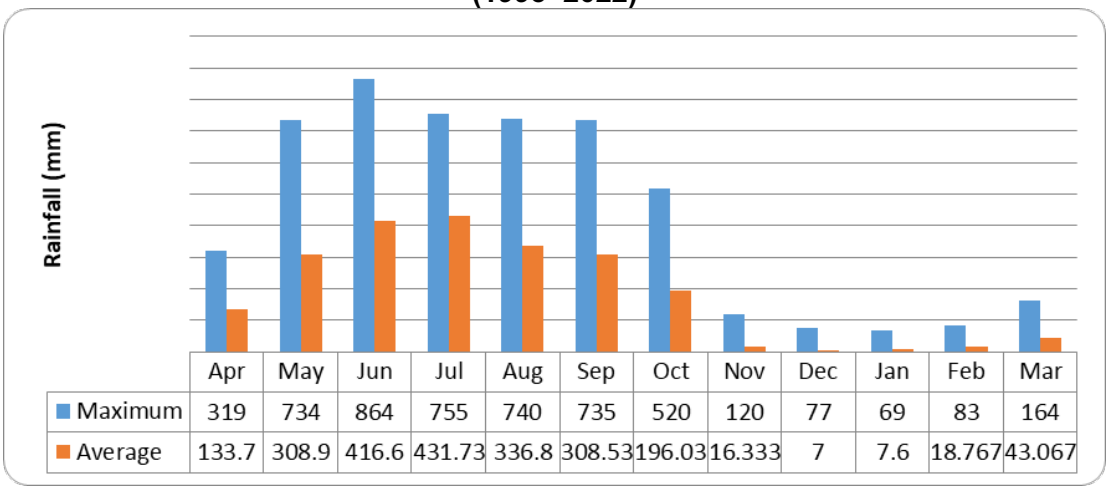


Source: Mymensingh BMD station (1993-2022).

123. **Rainfall:** The rainfall data of the last 30 years (1993–2022) reveal that the highest rainfall occurs in the area during April to October while November to March is the drier part of the year with very less rainfall. The analysis of data shows that the monthly average rainfall varies from 170.72 mm to 409.17 mm in monsoon and the area received the maximum of 864 mm rainfall in June 2007. The historical maximum annual rainfall from this station was recorded as 3,213 mm in 1993, the minimum was 975 mm in 2022, and the average annual rainfall is 2,107 mm. The monthly maximum and average rainfall are shown in Figure 4.10. The annual rainfall of this period is shown in Figure 4.11.

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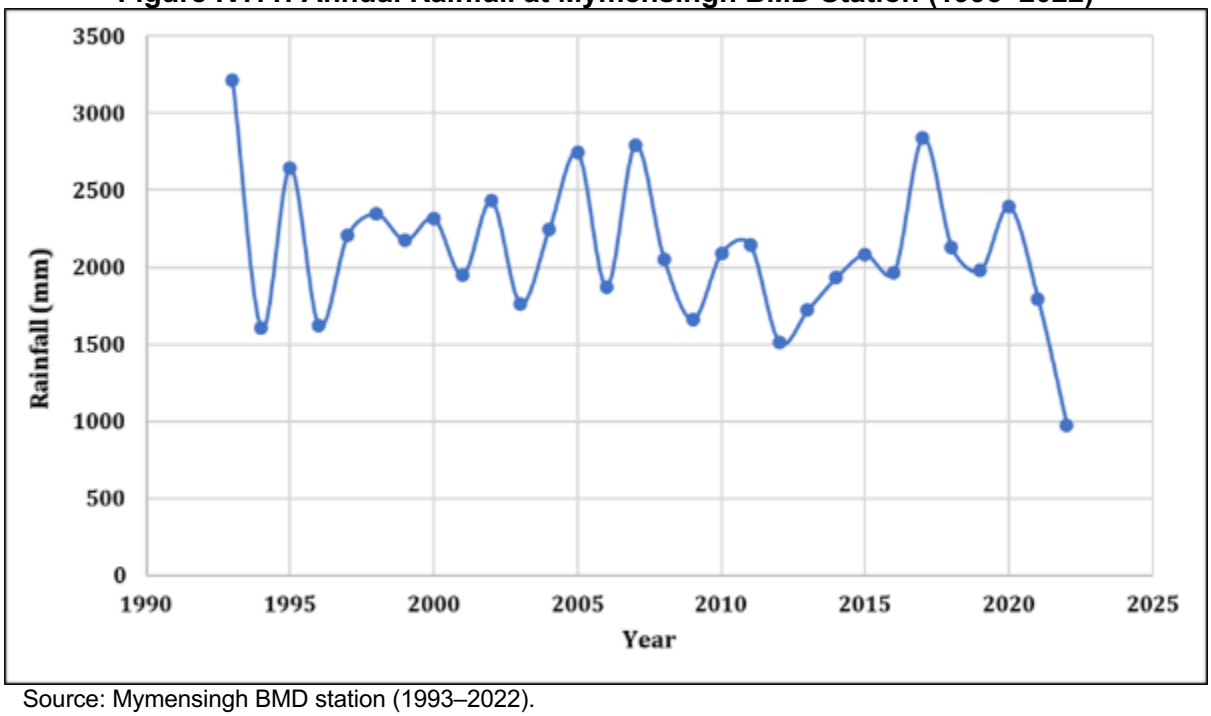
Figure IV.10: Monthly Maximum and Average Rainfall at Mymensingh BMD station (1993–2022)



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Maximum	319	734	864	755	740	735	520	120	77	69	83	164
Average	133.7	308.9	416.6	431.73	336.8	308.53	196.03	16.333	7	7.6	18.767	43.067

Source: Mymensingh BMD station (1993–2022).

Figure IV.11: Annual Rainfall at Mymensingh BMD Station (1993–2022)

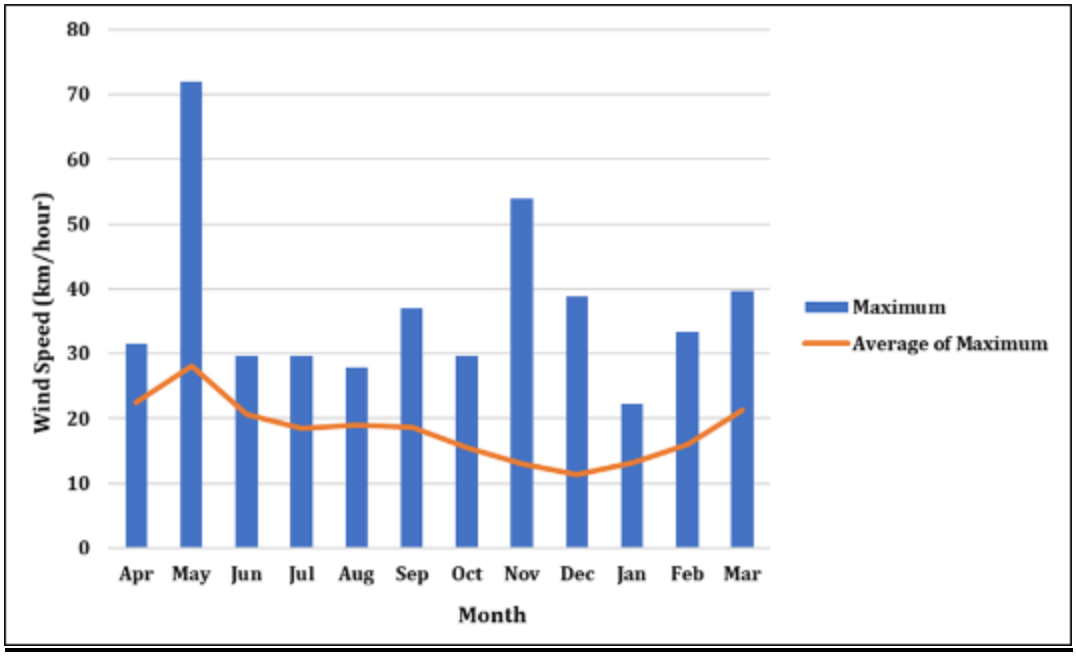


Source: Mymensingh BMD station (1993–2022).

124. **Windspeed:** The data of the maximum windspeed for the last 30 years (1993 to 2022) show that the monthly maximum wind speed of 72 km/hour occurred in May 2022. On the other hand, the average of maximum windspeed varies from 11.40 km/hour in December to 28.12 km/hour in May (Figure 4.12).

Figure IV.12: Monthly Maximum Wind Speed at Mymensingh BMD station (1993–2022)

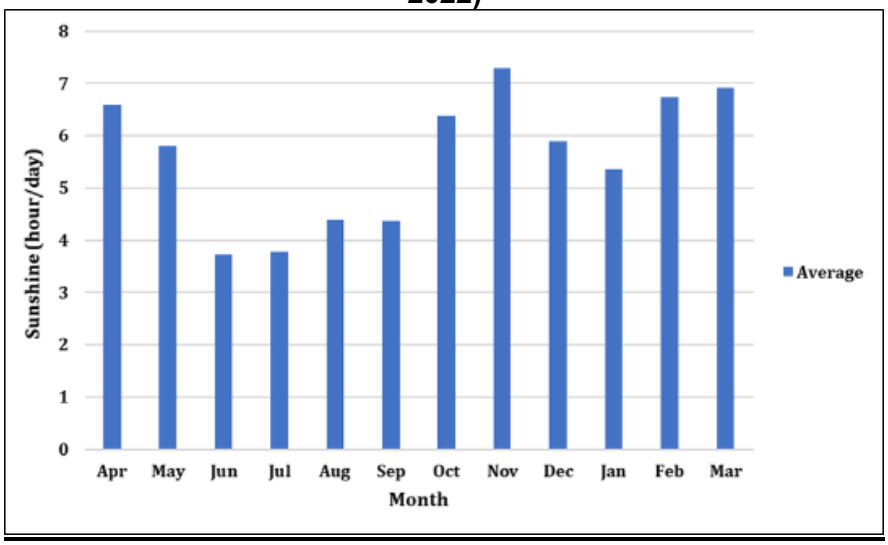
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Source: Mymensingh BMD station (1993–2022).

125. **Sunshine hours (SSH):** The sunshine hours recorded from 1993 to 2022 show that the average monthly SSH vary from 3.72 hour/day in June to 7.29 hour/day in November (Figure 4.13). The maximum SSH remains high during October until May and very low during June to September.

Figure IV.13: Monthly Variation of Sunshine Hours at Mymensingh BMD station (1993–2022)

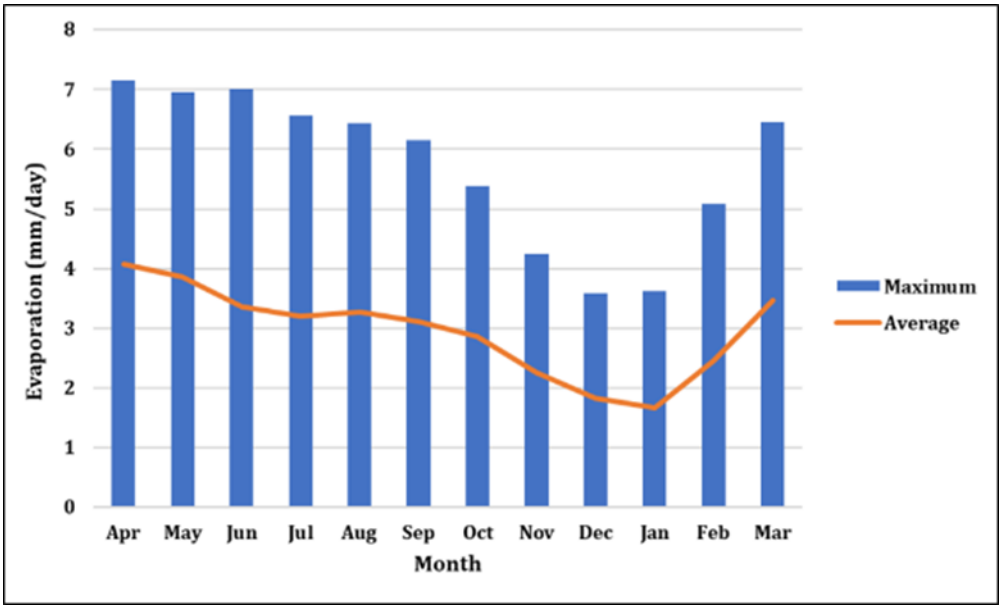


Source: Mymensingh BMD station (1993–2022).

126. **Evaporation:** The maximum and average monthly evaporation data for the last 25 years (1987–2011) were collected from BMD station at Mymensingh and is shown in Figure 4.14. It is observed that the evaporation changes with increasing temperature. The average of maximum evaporation in the area varies from 3.58 mm/day in December to 7.15 mm/day in April. Average monthly evaporation rates ranged from 1.67 mm/day (January) to 4.08 mm/day (April).

Figure IV.14: Monthly Variation of Evaporation at Mymensingh BMD station (1987–2011)

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Source: Mymensingh BMD station (1987–2011).

4. Environmental Quality Measurements

127. A one-time sampling for ambient air quality, noise, water quality and ground vibration was conducted in November 2022 by SGS Bangladesh engaged by the feasibility study consultant, TML Bangladesh Ltd. Results of the measurements are given in Appendix 2.

a. Ambient Air Quality, Noise, and Vibration

128. **Ambient air quality:** The sampling locations of ambient air quality within the PAI are shown in Figure 4.15.

129. Eight ambient air quality sampling stations were identified to establish the existing environment within the PAI. Ambient air quality measurements were carried out from 13–17 November 2022. Based on the initial ambient air quality measurements in eight sampling stations, PM_{10} and $PM_{2.5}$ limits were exceeded. The sampling stations are within the premises of BAU, and the existing ambient air pollution sources are movements of vehicles and daily activities of local people. No major source of ambient air pollution was identified during sampling. Prior to construction works, the contractor will be required to conduct additional baseline ambient air quality measurements. Construction activities for the new buildings may potentially increase the dust levels within the area. The construction environmental management plan (CEMP) required from the contractor will include a dust management plan to mitigate the potential increased dust levels during construction phase. Table 4.1 presents the 24-hour average results of ambient air quality parameters.

Table IV.1: Analysis of Ambient Air Quality Monitoring Results

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Ambient Air Quality Parameters								
No.	**Date & Time**		**AAQ1: (Proposed New Research Building Area)**					
			PM_{10}	**$PM_{2.5}$**	**SO_2**	**NO_2**	**CO**	**O_3**
1	Baseline	13-14 November 2022 15:00 to 15:00	61.08	29.44	<5	35.79	1.14	<0.1
AAQ2: (Bangladesh Fish Research Institute)								
2	Baseline	16-17 November 2022 16:10 to 16:10	82.41	32.92	<5	37.84	1.26	<0.1
AAQ3: (Farmers' Hostel)								
3	Baseline	13-14 November 2022 15:20 to 15:20	101.19	47.28	<5	51.20	1.48	<0.1
AAQ4: (BFRI Guest House)								
4	Baseline	16-17 November 2022 16:15 to 16:15	85.21	39.63	<5	39.72	1.26	<0.1
AAQ5: (BAU Residential Area)								
5	Baseline	14-15 November 2022 15:10 to 15:10	70.94	38.53	<5	36.14	1.48	<0.1
AAQ6: Dean office, Faculty of Agriculture (Renovation Building)								
6	Baseline	14-15 November 2022 15:40 to 15:40	67.02	36.38	<5	48.19	1.60	<0.1
AAQ7: Faculty of Veterinary Science (Renovation Building)								
7	Baseline	15-16 November 2022 15:50 to 15:50	76.57	39.60	<5	45.92	1.48	<0.1
AAQ8: Faculty of Fisheries (Renovation Building)								
8	Baseline	15-16 November 2022 16:00 to 16:00	65.43	34.80	<5	37.12	1.37	<0.1
Unit			$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m^3	$\mu g/m^3$
Duration (Hours)			24			annual	8	
Bangladesh Standard (Air Pollution Control Rules 2022 (Schedule-1), Gazette			150	65	80	100	5	100

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Ambient Air Quality Parameters							
No.	**Date & Time**	**AAQ1: (Proposed New Research Building Area)**					
		PM_{10}	**$PM_{2.5}$**	**SO_2**	**NO_2**	**CO**	**O_3**
publication Date: 26 July 2022)							
IFC-WB EHS General Guidelines 2007 (WHO Guidelines Global update 2021)		45	15	40	10	8	100
Method of Analysis		IS-5182 (Part23):2006	Gravimetric Method	IS 5182 (Part2):2001	IS 5182 (Part6):2006	In-House (in situ)	
Instrument Used		Respirable Dust Sampler	Fine Particulate Sampler	Respirable Dust Sampler	Respirable Dust Sampler	Air Quality Meter	Portable Gas Detector

Source: Sampling and Analysis done by Laboratory of SGS Bangladesh Limited.

Figure IV.15: Ambient Air Quality Sampling Stations



130. **Ambient noise level:** Noise levels were measured by TML and SGS at different locations within the PAI from 14–16 November 2022. The sampling stations are shown in Figure 4.16 while the noise limits based on the Noise Pollution Control Rules (NPCR) 2006 are given in Table 4.2. Results of ambient noise levels are given in Table 4.3. Based on the requirements of NPCR 2006, the project area will be considered as silent area. Based on the ambient noise level measurements in November 2022, limits for silent zone and residential areas set by the NPCR 2006 and the IFC-WB EHS Guidelines 2007 were exceeded both in daytime and nighttime. Additional ambient noise level measurements will be conducted by the contractor prior to civil works. Existing noise sources identified during sampling are vehicle movements and daily activities within the area. No major source of noise generation was identified during sampling. Construction of the new buildings during project implementation may potentially increase the noise levels.

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Table IV.2: Ambient Noise Levels Standards

Description of area	Noise level (Leq) in dBA	
	Daytime	Nighttime
i) Silence Zone – A sensitive area where quietness is of primary importance such as schools, hospitals, mosques, etc. and their surrounding 100-m area	50	40
ii) Residential areas	55	45
iii) Mixed areas, which are, used as residential areas as well as commercial and industrial purposes	60	50
iv) Commercial areas	70	60
v) Industrial areas	75	70

Daytime shall mean from 6:00 a.m. to 9:00 p.m.
Nighttime shall mean from 10:00 p.m. to 6:00 a.m.
Leq – energy means of the noise level over a specific period.

Figure IV.16: Ambient Noise Sampling Stations



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Table IV.3: Results of Ambient Noise Level Measurements

ID of Monitoring Locations	Name of the Location	GPS Location	Receptor (As per IFC Guideline)	Monitoring Date & Time		Time	Measured Noise Level in Laeq, dB(A)	IFC, 2007	NPCR, 2006	Remarks
							Baseline			
ANL-1	New Building Area	24°43'5.75"N 90°25'27.72"E	Educational	14.11.2022	13:07	Day	41.5	55	50	Infrequent people movement.
					21:22	Night	41.0	45	40	
ANL-2	Bangladesh Fish Research Institute (BFRI)	24°43'16.78"N 90°25'16.09"E	Educational	16.11.2022	14:20	Day	47.9	55	50	There are no noise sources around the sampling station. Infrequent people movement.
					21:07	Night	42.3	45	40	
ANL-3	Farmers Hostel	24°43'9.68"N 90°26'37.18"E	Residential	14.11.2022	11:58	Day	48.5	55	55	Busy road is located on the west side of sampling station. Different types of vehicles use the road available. People movement observed during daytime.
					22:13	Night	44.8	45	45	
ANL-4	BFRI Guest House	24°43'5.75"N 90°25'15.39"E	Residential	16.11.2022	14:20	Day	46.9	55	55	No noise source observed around the sampling station.
					21:11	Night	43.2	45	45	
ANL-5	BAU Residential Area	24°43'42.16"N 90°26'0.59"E	Residential	15.11.2022	12:28	Day	44.4	55	55	No noise source observed around the sampling station.
					21:24	Night	41.5	45	45	
ANL-6	Dean's Office, Faculty of Agriculture (Renovation Building)	24°43'23.34"N 90°26'8.94"E	Educational	15.11.2022	13:08	Day	51.9	55	50	The main road of the campus is located on the east and west sides of the sampling station. During daytime, noise level is also high due to railway movement, cars/vehicles movement, tea stall and food hotels located some distance
					21:50	Night	41.6	45	40	

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ID of Monitoring Locations	Name of the Location	GPS Location	Receptor (As per IFC Guideline)	Monitoring Date & Time		Time	Measured Noise Level in Laeq, dB(A) Baseline	IFC, 2007	NPCR, 2006	Remarks
										from the noise sampling station.
ANL-7	Faculty of Veterinary Science (Renovation Building)	24°43'31.23"N 90°26'18.00"E	Educational	16.11.2022	12:32	Day	54.6	55	50	Busy road is located on the west side of sampling station. Different types of vehicles are plied on the road. People movement observed.
					21:40	Night	43.3	45	40	
ANL-8	Faculty of Fisheries (Renovation Building)	24°43'36.53"N 90°26'8.94"E	Educational	16.11.2022	12:58	Day	46.3	55	50	No noise source as such around the sampling station.
					21:28	Night	41.7	45	40	

Notes:

- Land use category is based on the classification provided in the IFC-WB EHS General Guidelines 2007.
- Shaded cell indicates noise levels are above the ambient noise limits set in the Noise Pollution Control Rules 2006.
- NPCR 2006, the sound level standard for silent zone is 50 dB (A), and residential area is 55 dB (A) at daytime and 40 dB (A) and 45 dB (A) at nighttime, respectively.
- IFC-WB EHS General 2007 (IFC-2007), the sound level standard for educational/residential is 55 dB(A) at daytime and 45 dB(A) at nighttime.
- Noise level is the average noise recorded over the duration of the sampling.

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131. **Ground vibration:** Vibration level measurements were carried out at five preselected sampling stations in and around the project site as shown in4.17. Locations of the vibration level measurements are S1-Academic Building, S2-Animal Husbandry, S3-Karim Bhaban, S4-New Research Building South Side, S5-New Research Building North Side, respectively.

132. The results presented in Table-4.4 show that the maximum acceleration was 11.9 m/s^2 at location S1 (near academic building) and the minimum acceleration was recorded as 1.3 m/s^2 at location S2 (near animal husbandry).

133. The readings were taken inside the university area where no heavy activities (e.g., earthwork, mechanical source etc.) were observed. Some readings were taken near roads (at location S1, S2 and S3, respectively) where rickshaw and CNG were the prominent vehicle types. Thus, the sources for vibration are limited to vehicular movement and anthropogenic activities.

134. The DOE has no standard for ground vibration or exposure to occupational vibration. The International Society for Soil Mechanics and Geotechnical Engineering cites that Canada uses a vibration limit of 12.5 mm/s when vibration monitoring is conducted which is close to the vibration limit of 12.7 mm/s for ground vibrations developed by the US Bureau of Mines (USBM) RI 8507. From the American Conference of Governmental Industrial Hygienists (ACGIH) developed threshold limit value (2016 edition), the exposure limit of 5.0 m/s^2 is the maximum vibration level for hand-arm exposure that a worker can be exposed to average over an 8-hour shift.[48] Given that the location of the two new buildings are within the BAU campus and also the scale of the project, no blasting will be involved.

Figure IV.17: Vibration Level Sampling Locations



[48] Canadian Centre for Occupational Health and Safety. Vibration – Measurement, Control and Standards.

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Table IV.4: Results of Vibration Measurements

Sampling Station	Name of Location	GPS Location	Date of Measurement	Acceleration (m/s^2)
S1	Academic Building	24°43'23"N 90°26'09"E	13.11.2022	11.9
S2	Animal Husbandry	24°43'36.16"N 90°26'9.84"E	13.11.2022	1.3
S3	Karim Bhaban	24°43'18.5"N 90°26'32.4"E	13.11.2022	4.3
S4	New Building South Side	24°43'5.72"N 90°25'28.18"E	13.11.2022	4.4
S5	New Building North Side	24°43'9.51"N 90°25'28.5"E	13.11.2022	8.1

5. Geology and Topography

135. Geomorphologically, the area is broadly classified into Older Floodplain or Mymensingh Terrace and Younger Floodplain. These two flood plains are separated by Old Brahmaputra River. Geologically the area is mainly covered by the recent alluvial flood plain deposits which are underlain by the Pleistocene Madhupur clay deposits. The Younger Flood Plain deposit consists of mainly unconsolidated fine to medium sands with some silt and clay whereas the Older Flood Plain deposits are mainly consisting of silty clay and fine to medium sand. Moderately compacted sediments of Older Flood Plain deposit are suitable for urban development (Salma *et al.*).[49]

136. The proposed site falls within the Physiographic sub-unit 12 namely "Old Brahmaputra Floodplain." Old Brahmaputra Floodplain was originated through the shifting of the river from a course around the eastern edge to the western side of the Madhupur Tract. This new portion of the Brahmaputra is named Jamuna. The old course (old Brahmaputra) between Bahadurabad and Bhairab has shrunk through silting into a small seasonal channel only 2-km wide. The old river had already built up fairly high levees on either side over which the present river rarely spills. The Old Brahmaputra Floodplain stretching from the southwestern corner of the Garo Hills along the eastern rim of the Madhupur Tract down to the Meghna exhibits a gentle morphology composed of broad ridges and depressions. The latter is usually flooded to a depth of more than one meter, whereas the ridges are subject to shallow flooding only in the monsoon season (Banglapedia).[50]

6. Seismicity

137. Based on the earthquake zoning map of Bangladesh, the site is in Earthquake Zone IV (Figure 4.18), where the seismic intensity is high to medium (0.8g-0.5g). This region was badly affected by the 1897 earthquake whose epicenter was in the Shillong plateau. The active tectonic movement and recent earthquakes in and around the study area warns that earthquake catastrophe may take place in this area. Budget was allocated to incorporate the

[49] Salma Akter, Reshad Md. Ekram Ali, Shahtai Karim, Mahmuda Khatus, Mahmuda Feruj Alam (2018). Geomorphological, Geological and Engineering for Sustainable Urban Planning of Mymensingh City, Bangladesh, Open Journal of Geology, Vol.8 No.7, 737-752.

[50] Banglapedia - the National Encyclopedia of Bangladesh. Physiography (accessed 12 May 2020).

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appropriate seismic codes and earthquake load in the building design as required by the BNBC 2020.

Figure IV.18: Earthquake Zoning Map of Bangladesh



7. Hydrology/Water Resources

138. The study area consists of rivers, *khals* and ponds as the sources of surface water and groundwater is also available.

a. Surface Water

139. **Surface water level and discharge:** The monthly discharge data of the Old Brahmaputra River from 1977 to 2006 were collected from the Mymensingh station (Station ID: 228.5) of the Bangladesh Water Development Board (BWDB). Data show that river discharge is high in monsoon (June-October) and the maximum discharge was recorded as 4,890 m^3/sec in September 1988. The discharge gets reduced in dry season (November-May). The average maximum and minimum discharge were recorded as 14.64 m^3/sec in March and 1,635.97 m^3/sec in July, respectively.

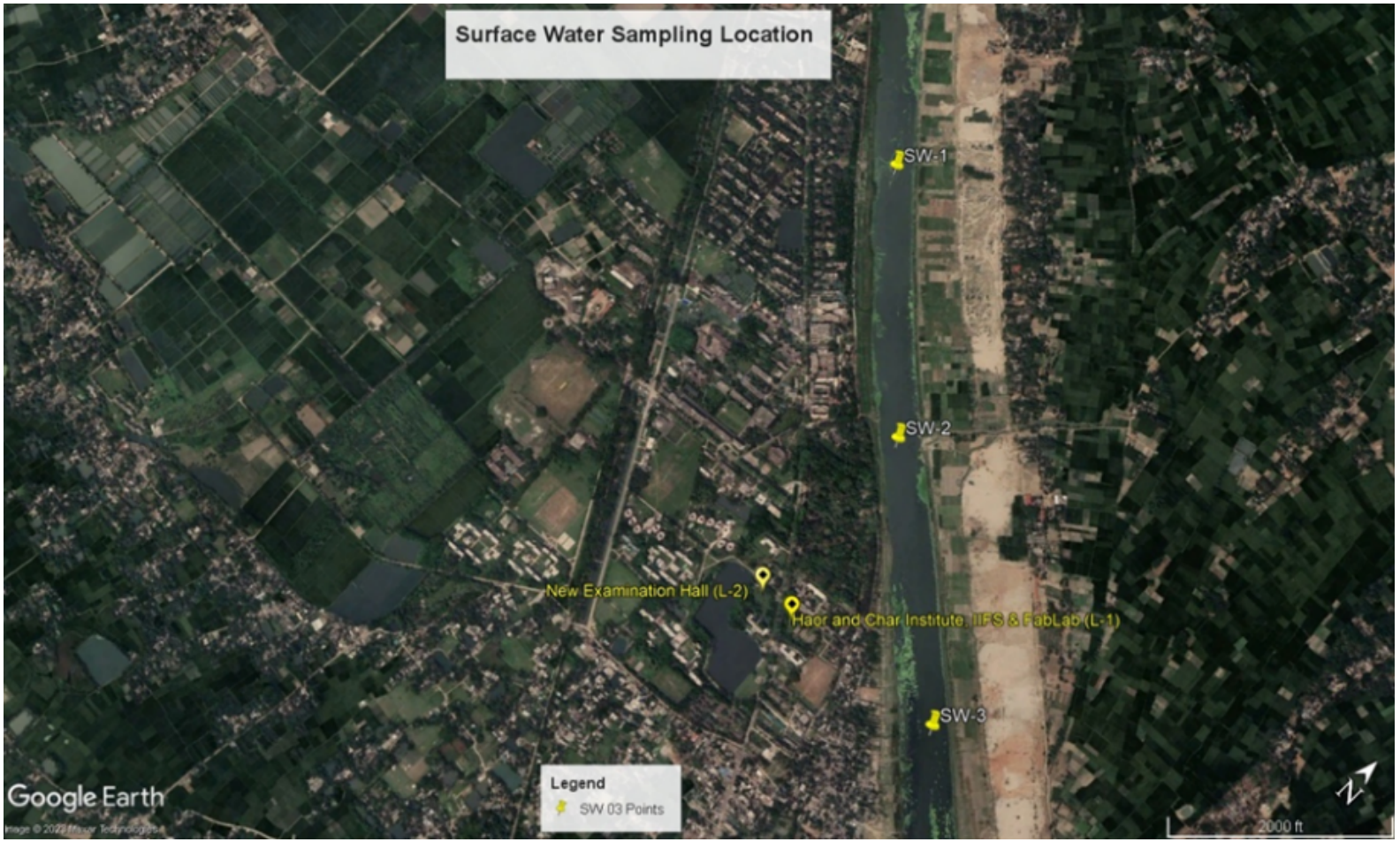
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140. **Surface water quality:** Surface water quality was assessed by taking and analyzing samples in the study area. Surface water samples were collected from three preselected locations at Old Brahmaputra River on 17 November 2022. Figure 4.19 shows the sampling stations.

141. Eight water quality parameters were measured in situ and laboratory testing. Water quality standards from the Environment Conservation Rules (ECR) 2023 (Schedule 2) were used as reference limits. Results of one-time sampling conducted in November 2022 suggest that the stretch of the Old Brahmaputra River where the three sampling stations are located generally meet the limits for dissolved oxygen, pH, BOD, nitrate, and heavy metals set forth by ECR 2023 Schedule 2 for inland surface water used for pisciculture. Total coliform, however, was exceeded. The level of dissolved oxygen indicates that the stretch of the Old Brahmaputra River can sustain aquatic life. The results of the surface water quality sampling are shown in Table 4.5.

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Figure IV.19: Surface Water Quality Sampling Locations



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Table IV.5: Results of Surface Water Quality Measurements (Old Brahmaputra River)

Date and Time of Sampling	17 November 2022, SW-1 12:40, SW-2 12:54. SW-3 13:00 (Distance between sampling locations approximately 0.8 km)				
Parameter	Unit	Test Results			Standards for Inland Surface Water, Bangladesh Environmental Conservation Rules (ECR) 2023 [specific-water usable for pisciculture]
		SW-1 (Upstream)	SW-2 Middle point	SW-3 (Downstream)	
		24°43'52.80"N 90°26'8.74"E	24°43'34.75"N 90°26'28.14"E	24°43'18.62"N 90°26'49.88"E	
pH	-	8.22	8.19	8.23	6-9
Turbidity	NTU	8.55	3.17	12.68	NYS[1]
Dissolved Oxygen, DO	mg/L	6.52	6.62	6.58	≥5
Oil & Grease	mg/L	ND[2]	ND	ND	0.14 (reference-coastal water)
Total Hardness (as $CaCO_3$)	mg/L	163	173	171	NYS
Biochemical Oxygen Demand, BOD_5	mg/L	3	3	4	≤6
Nitrate (NO_3)	mg/L	ND	0.31	0.52	7.0
Hexavalent Chromium (Cr-VI)	mg/L	ND	ND	ND	0.05 (reference-coastal water)
Arsenic (as As)	mg/L	ND	ND	ND	0.003 (coastal water)
Cadmium (as Cd)	mg/L	ND	ND	ND	0.005 (coastal water)
Lead (as Pb)	mg/L	ND	ND	ND	0.1
Total Coliform	CFU/100 ml	16000	16000	16000	≤5000

Source: Sampling and Analysis done by Laboratory of SGS Bangladesh Limited; Note: 1. Not yet stated.

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b. Groundwater

142. **Ground water availability:** The subsurface formation of the study area (Mymensingh Sadar Upazila) consists of clay, sandy clay, and fine sand at the upper part while medium sand, coarse sand at the lower part of subsurface lithology. The average thickness of upper layers, composite layers and main aquifer were 33.8 m, 27.6 m and 43.8 m, respectively (Zobayer *et* all, 2015).[51]

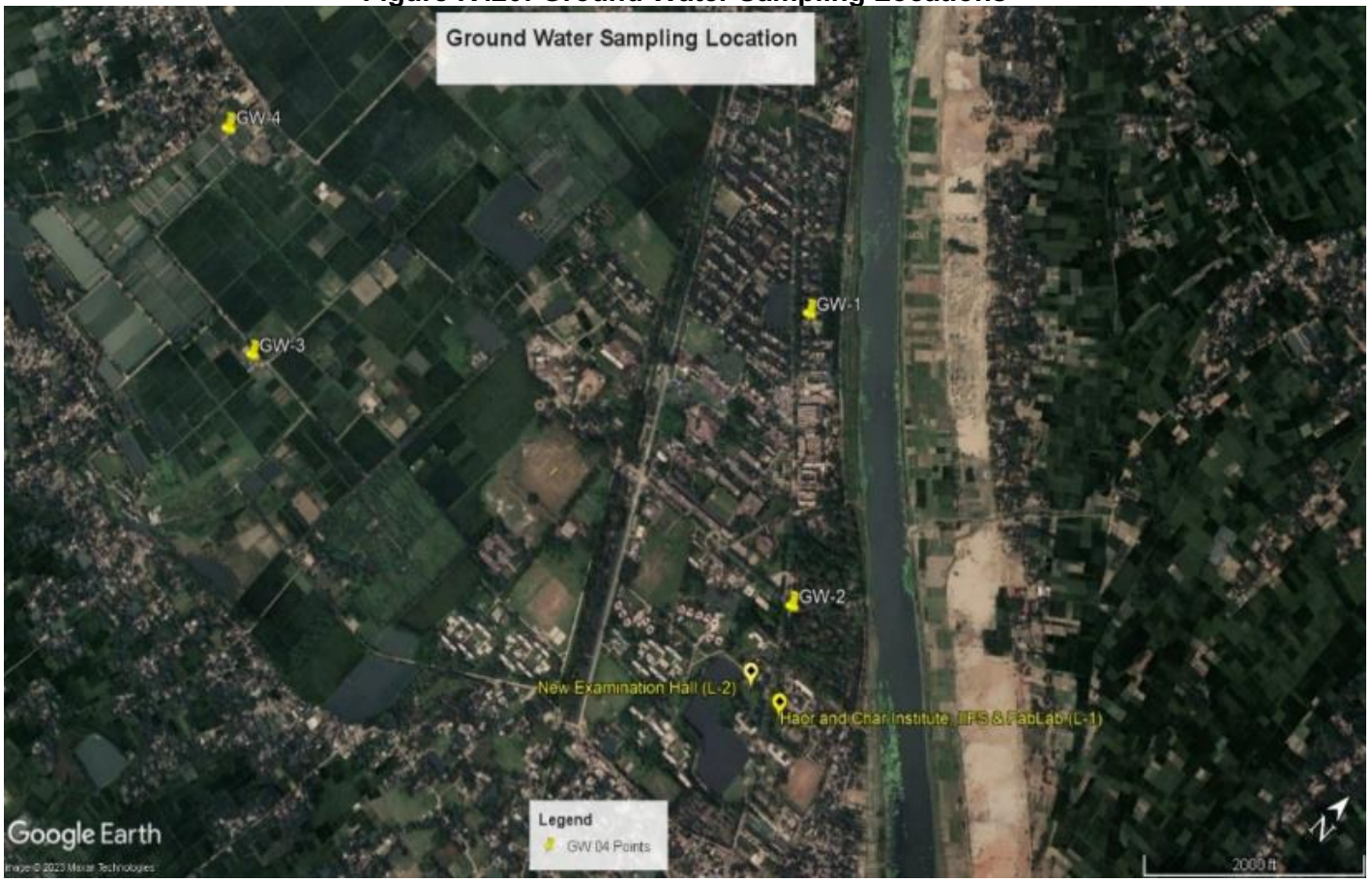
143. The static water level started rising in April and continues to rise to September or October. The water level starts to deplete from September or October and continues up to April. The recharge and depletion characteristics were found to be almost in equilibrium condition. The long-term trend of groundwater level was found to be in declining position in the recent years.

144. **Ground water quality:** Four groundwater sampling stations were identified within the PAI, and sampling was done on 17 November 2022. Results of groundwater sampling suggest that it can be a source of drinking water with prior treatment (i.e., total coliform was not met in all the sampling stations and turbidity in one sampling station). Figure 4.20 shows the sampling locations and Table 4.6 gives the results of sampling.

[51] Zobayer Ali Basunia1, M. A. Hossain2, Abu Sayed3*, Mohammad Ali4 and G. M. Abdur Rahman, Evaluation of Ground Water Resources in Mymensingh Sadar Upazila, Bangladesh, Asian Journal of Agricultural Extension, Economics & Sociology, 7(4): 1-10, 2015; Article no. AJAEES.20636, ISSN: 2320-7027.

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Figure IV.20: Ground Water Sampling Locations



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Table IV.6: Results of Ground Water Quality Sampling

Date and Time of Sampling	17 November 2022, GW-1 12:05, GW-2 13:27, GW-3 14:07, GW-4 14:48					
Parameter	Unit	Test Results				Standards for Drinking Water Quality Bangladesh ECR 2023
		GW-1: Front side of Residential Area (24°43'43.12" N 90°26'8.59" E)	GW-2: Front side of Botanical Garden (24°43'23.88" N 90°26'26.82" E)	GW-3: Back side of Farm Management Branch (24°43'4.04" N 90°25'31.14" E)	GW-4: Inside of BFRI (24°43'16.18" N 90°25'13.06" E)	
pH	-	7.18	7.36	7.45	7.19	6.5 – 8.5
Turbidity	NTU	8.88	ND	ND	ND	5
Oil & Grease	mg/L	ND [2]	ND	ND	ND	0.01
Total Chromium	mg/L	ND	ND	ND	ND	0.05
Arsenic (as As)	mg/L	ND	ND	ND	ND	0.05
Cadmium (as Cd)	mg/L	ND	ND	ND	ND	0.003
Lead (as Pb)	mg/L	ND	ND	ND	ND	0.01
Total Coliform	MPN/100 ml	<1.8[3]	<1.8	<1.8	<1.8	0

Notes:
1. Bangladesh Standards for Drinking Water Quality, ECR 2023.
2. ND – Not Detected.
3. If no evidence of total coliform observed in the tested sample based on 5 tubes, express result as <1.8 MPN/100 ml.

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c. Drinking Water

145. **Drinking water quality:** Ground water samples from two sampling stations within the BAU campus were taken on 17 November 2022. Figure 21 shows the sampling stations. Drinking water-1 is located near the Faculty of Animal Husbandry while Drinking water-2 is located at the Research Animal Farm.

146. Results of sampling for drinking water quality show that the parameters are within the limits set by the ECR 2023 for drinking water quality except for total coliform. Thus, water needs to be boiled prior to drinking. Table 4.7 presents the results of sampling.

Figure IV.21: Drinking Water Sampling Stations



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Table IV.7: Results of Drinking Water Quality Sampling

Date and Time of Sampling	**17 November 2022, 11:48 to 13:49**			
Parameter	**Unit**	**Test Results**		**Standards for Drinking Water Quality Bangladesh ECR 2023**
		Drinking Water-1, Faculty of Animal Husbandry (24°43'35.52"N 90°26'8.49"E)	**Drinking Water-2, Research Animal Farm** (24°43'19.62"N 90°25'47.58"E)	
pH	-	7.31	7.28	6.5 – 8.5
Odor	mg/L	Unobjectionable	Unobjectionable	Odorless
Turbidity	NTU	ND[i]	ND	5
Total Suspended Solid (TSS)	mg/L	ND	ND	10
Total Dissolved Solid (TDS)	mg/L	258	254	1000
Oil & Grease	mg/L	ND	ND	0.01
Total chromium (Cr)	mg/L	ND	ND	0.05
Arsenic (as As)	mg/L	ND	ND	0.05
Cadmium (as Cd)	mg/L	ND	ND	0.003
Lead (as Pb)	mg/L	ND	ND	0.01
Total Coliform	MPN/100 ml	<1.8[ii]	<1.8	0

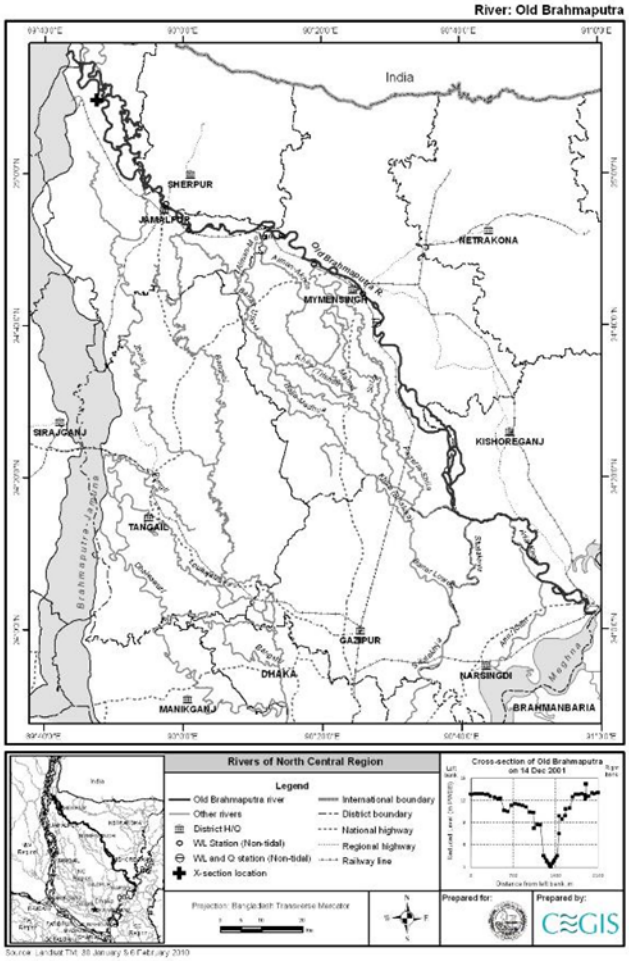
Source: Sampling and Analysis done by Laboratory of SGS Bangladesh Limited.
Notes: i. ND – Not Detected. ii. If no evidence of Fecal Coliform observed in the tested sample, as per 5 tube table result expressed as <1.8 MPN/100 ml.

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d. River Description

147. Old Brahmaputra is the major river in the study area which flows within 1.5 km from the proposed site. The river length is about 282 km that originates from Brahmaputra-Jamuna River at Fulchari Upazila of Gaibandha District and falls into the Upper Meghna River at Bhairab Upazila of Kishorganj District. The maximum discharge of the river found in monsoon (July-September) and in dry season most parts get dry with sandy riverbed. The river width is more than 500 m close to the Mymensingh Town (Figure 4.22). [52]

Figure IV.22: Map of Old Brahmaputra River



8. Land and Soil

a. Land Types

148. Land type classification is based on depth of inundation during monsoon season due to normal flooding on agricultural land. In terms of depth of flooding, the following five classes of land types are recognized by the Master Plan Organization (MPO). In the study area, three

[52] Bangladesher Nod Nodi, Uttor Kendriyo Onchol, Hydrology, Processing and Flood Forecasting, Second Edition, Bangladesh Water Development Board (BWDB); August 2011.

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classes of land types (high land, medium highland and medium lowland) have been classified in terms of depth of flooding on agricultural land. The entire study area is under F0, F1 and F2 land types. In addition, more than 20% of the study area is occupied by river and settlements. Project area falls under medium highland. Detailed distribution of land type of the study area is presented in Table 4.8.

Table IV.8: Land Type Wise Cultivated Area During Study Period

	Depth	% of the net cultivated area
High land (F0)	This class has been subdivided into two classes: (i) Land which is above normal flood level. (ii) Normally flooded from 0 – 30 cm.	49
Medium Highland (F1)	Land, which normally is flooded between 30-90 cm deep continuously more than two weeks to few months during the flood season.	21
Medium Low Land (F2)	Land, which normally is flooded between 90 -180 cm deep of inundation continuously for few months in flood season.	9
River	Land which falls within river area	2
Settlement	Land with built up area	19
Total		**100**

Source: MPO, 1998.

b. Agro-ecological Zones

149. Bangladesh has been tentatively divided into 30 Agroecological Zones (AEZ) based on hydrology, physiography, soil types, tidal activity, cropping patterns, and seasons. An AEZ indicates an area characterized by homogeneous agricultural and ecological characteristics.

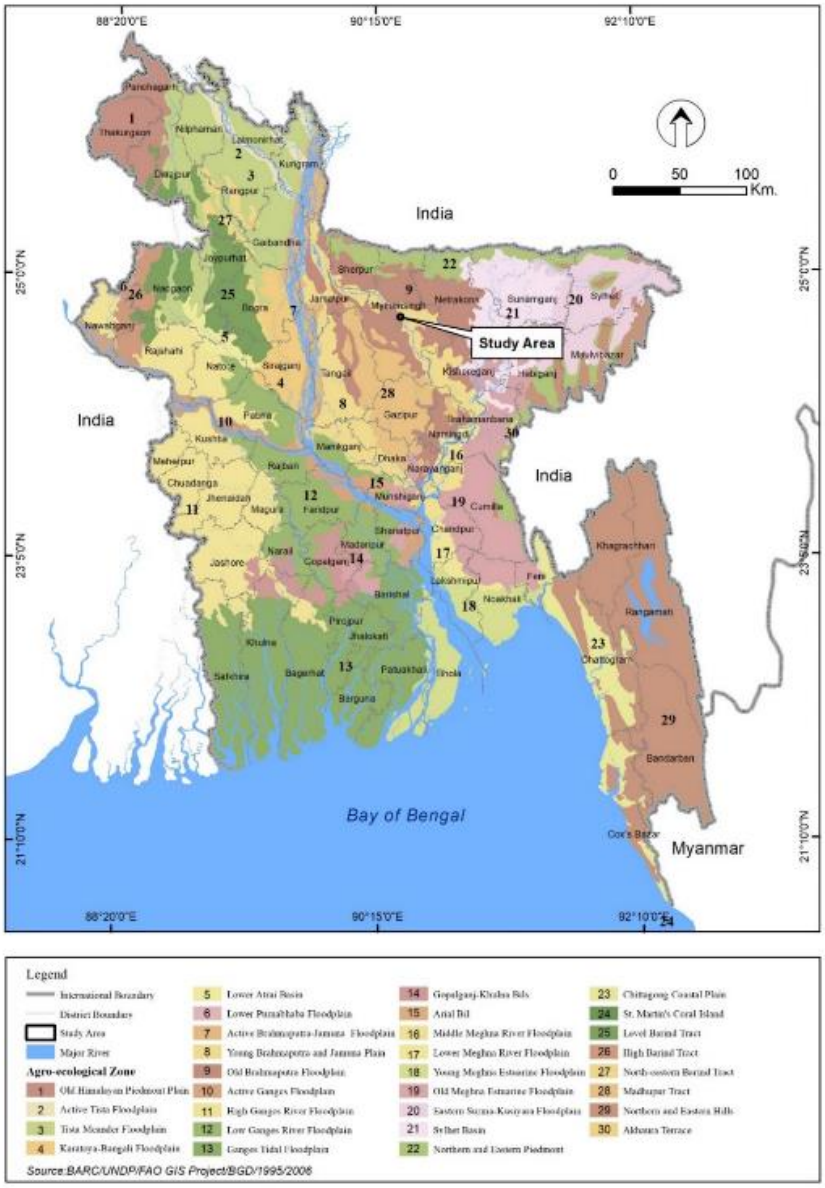
150. The study area falls within two of the zones, namely 'Young Brahmaputra and Jamuna Floodplain' and 'Old Brahmaputra Floodplain' which covers 83% and 17% of total study area, respectively. The Young Brahmaputra and Jamuna Floodplain comprises the area of Brahmaputra sediments. It has a complex relief of broad and narrow ridges, inter-ridge depressions, partially in filled cut-off channels and basin. This area is occupied by permeable silt loam to silty clay loam soils on the ridges and impermeable clays in the basins, neutral to slightly acid in reaction. General soil types include predominantly gray floodplain soils. Organic matter content is low in ridges and moderate in basins. Soils are deficient in N, P, and S but the status of K and Zn are reasonable.[53]

151. Old Brahmaputra Floodplain occupies a large area of Brahmaputra sediments before the river shifted to its present Jamuna channel about 200 years ago. The region has broad ridges and basins. Relief is irregular, especially near the old and present river channels. Soils of the area are predominantly silt loams to silty clay loams on the ridges and clay in the basins. Organic matter content is low on the ridges and moderate in the basins, topsoil moderately acidic but subsoils neutral in reaction. General fertility level is low (footnote 48). Figure 4.23 presents the study area on AEZ of Bangladesh.

[53] Banglapedia - the National Encyclopedia of Bangladesh. Agroecological Zone (accessed 1 July 2020).

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Figure IV.23: Study Area on AEZ Map (Soil)



151. Considering the climate as the most active pedogenic factor, Bangladesh was divided into three zones: humid, semi-humid and feebly arid and the proposed site falls into semi-humid zone. Pedoclimatic zone was defined as representing an area where the climatic factor working on parent material has produced similar soils. The zone is north-northeast flat and the southwest lowland. The probable soil association being of degraded lateritic and alluvial.

c. Soil Texture

152. The soil of Mymensingh area consists of Madhupur Tract or Red Soil Tract. This tract represents the red lateritic soils of Madhupur area, a highland tract above flood level intersected by numerous large and small depressions, locally known as 'BAID'. The soils of this tract have

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clayey texture and contain large quantity of iron and aluminum, which are highly aggregated. The pH value ranges from 5.5 to 6.0 in the topsoil. The cation exchange capacity is low, and the soils have the high phosphate fixing capacity. The soils are deficient in organic matter, nitrogen, phosphorus, and lime (Reference: Banglapedia).

153. Soil texture is the relative content of particles of various sizes, such as sand, silt and clay in the soil. Soil texture is an important soil characteristic that determines crop selection, crop production and field management. It influences many other properties of great significance to land use and management. Out of four major textural classes; a) sand, b) silt, c) loam, and d) clay; the entire study area has three types of texture, which are clay, clay loam and loam (Table 4.9).

Table IV.9: Detailed Soil Texture in Study Area

	Percent
Clay Loam	7
Loam	70
Total	**100**

Source: SRDI 1995.

C. Biological Environment

154. The site falls under the Bio-ecological Zone-4c (Brahmaputra-Jamuna Floodplain). The zone is influenced by seasonal flooding from Brahmaputra River. Land type within the study area is considered medium highland (F1) which is normally flooded between 30-90 cm deep continuously more than two weeks to few months during the flood season. However, the project sites of about 4.5932 ha are not in the flood-prone area. Verbal accounts during consultations reveal that BAU campus has not experience flooding since it started operation in 1961.

1. Terrestrial Flora and Fauna

a. Terrestrial Flora and Fauna of the Project Site

155. Terrestrial flora is classified according to their habitat. Each habitat supports a unique collection of plant species. Proposed site has some shrubs that serves mainly as an open green space and has been used as the roaming habitats for some local birds and animals. Common bird species found are Vat Salik *(Acridotheres tristis)*, Black-rumped Flameback/Kattokhra *(Dinopium benghalense)*, Oriental Magpie Robin/Doel (*Copsychus saularis*), House sparrow/Charai *(Passer domesticus)* and animals recorded are common house rat, and house mouse. In addition, among reptiles, common lizards were found within the project area which include garden lizard *(Calotes versicolor)* and house lizard *(Hemidactylus frenatus)*. The proposed site does not hold any designated habitats for birds or other wildlife and birds noted roaming in the project area are very common in other parts of Mymensingh District.

b. Terrestrial Flora and Fauna of the Study Area

156. The study area occupies surrounding urban area which possessed mainly planted vegetation. Species dominating the floral community in the campus area of BAU are Kanthal *(Artocarpus heterophyllus)*, Aam *(Mangifera indica)*, Akashmoni *(Acacia auriculiformis)*, Jaam *(*Syzygium *cumini)*, Koroi *(Albizia procera)*, etc. BAU campus consists of many floral compositions which are mainly categorized as roadside vegetation, garden, park and building side vegetation,

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research plot vegetation, orchards, and natural vegetation within the fallow and unused land. Among the natural terrestrial vegetation, grasses are the dominated community followed by the seasonal herbs.

157. Terrestrial birds of the locality can be divided into two major groups; birds observed in floodplains and wetland, and birds observed in dry land habitat such as homestead, open woodland, scrub, and grass land. Birds of prey survive well in the area.

158. Common bird of prey species that have been found within the surrounding areas are Common Kingfisher/Machranga *(Alcedo atthis)*, Bronzed Drongo/Fingey *(Dicrurus aeneus)*, Crested Serpent Eagle *(Spilornis cheela)*, Spotted Owlet/ Khuruley Pencha *(Athene brama),* etc. Other common birds species which were reported in the study area are: Common Mynah/Vat Salik *(Acridotheres tristis)*, Black-rumped Flameback/Kattokhra *(Dinopium benghalense)*, Oriental Magpie Robin/Doel (Copsychus saularis), House sparrow/Charai *(Passer domesticus)*, Jungle Babbler/Sat vaila *(Turdoides striata)*, Gui Salik, Eurasian Collared Dove *(Streptopelia decaocto)*, Red-vented Bulbul *(Pycnonotus cafer)* Spotted Dove *(Streptopelia chinensis)*, Black-hooded Oriole/Holdey pakhi *(Oriolus xanthornus),* etc. All these noted bird species are very common to other parts of Mymensingh District.

159. Among the other wildlife, Jackal *(Canis aureus)*, common house rat *(Rattus rattus)*, house mouse *(Mus musculus)*, Indian flying bat *(Pteropus giganteus)*, common mongoose *(Herpestes edwardsi)*, are the major species. Reptiles like Bengal Gray Lizard *(Veranus negalensis)*, Garden Lizard *(Calotes versicolor)*, Monocelate Kobra *(Naja kaouthia)*, dark bellied marsh snake *(Xenocrophis cerasogaster)* are known to occur in the area. The common lizards found within the study area include garden lizard *(Calotes versicolor)* and house lizard *(Hemidactylus frenatus)*. Amphibian species favor wetland areas and the marginal dried areas. Some species like common toad *(Bufo melenostictus)*, Jerdon's bull frog *(Hoplobatrachus crassus)*, Maculated tree frog *(Polypedates maculatus)*, Balloon frog *(Uperodon globulosus)* prefer the cool, damp habitats of BAU Campus.

2. Aquatic Flora and Fauna

a. Aquatic Flora and Fauna of the Project Site

160. During the reconnaissance field visit (September 2020), there is no aquatic habitat in the project site.

b. Aquatic Flora and Fauna of the Study Area

161. The study area supports aquatic flora and faunal communities, the major types of aquatic floral species found in the surrounding study areas are as follows:

- Submerged plants;
- Free floating plants;
- Rooted floating plants;
- Sedges and meadows;
- Marginal (on surrounding saturated soil).

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162. Submerged plants are prevalent in the study area in seasonal wetland. Almost all of these plants are monocotyledons and in closely related families like *Aponogetonaceae*, *Hydrocharitaceae* and *Potamogetonacea*. These plants start growing with the rise of water level and persist as long as water is present. *Hydrilla verticillata,* and *Vallisneria* sp are most common within this vegetation type.

163. Free floating plants are also common throughout the area. Among these species, *Eichhornia crassipes* is the single most dominant species followed by *Salvinia*, *Azolla* and *Lemna*. Rooted floating plants are one of the most dominant plant types in the perennial and seasonal wetland areas. Among these types at the species level, Sada sapla *(Nymphae nouchali)* is the most common.

164. Sedges and meadows form an ecotone type consisting of amphibian plants. This type has the highest species diversity and is one of the most important wetland plant communities in the study area. At the species level, *Scirpus articulatus* is common in all the beels as well as seasonal flood plains.

165. Marginal plants are not defined as community; rather they are a composition of both wetland plants and small dry land herbs occupying surrounding saturated soil. The composition of the marginal plants depends on the degree of water logging and the flood tolerance of each species. Among these types, *Cyperaceae* is the dominant family followed by *Amaranthaceae* and *Gramineae*.

166. Occurrence of aquatic fauna is limited within the Old Brahmaputra River surroundings and the perennial waterbodies within the BAU Campus. Amphibians and birds are the common aquatic faunal groups found in surrounding study area. Among amphibians, Bull frog *(Hoplobatrachus tigerinus)* is common and found in most wetland habitat and has been the most successful in adapting to the habitat. The turtle species rarely found in the river and floodplain areas are Indian black turtle *(Melanochelys trijuga)*. Common aquatic snakes have been found are Checkered keelback *(Xenocrophis piscator)*, Cantor's kukri snake *(Oligodon cyclurus),* etc.

167. Aquatic and water-dependent birds have been severely affected by the alteration of the natural habitat surrounding the study area. Wetland degradation has left very little or no sheltered place for waterfowl to roost or nest. Common wetlands bird species available in the study areas are Little Cormorant *(Phalacrocorax niger)*, Little Egret *(Egretta garzetta)* etc.

168. Several species listed in the IUCN *Red Data Book* occurs within the study area. These species include Monocelate Kobra *(Naja kaouthia)* (NT),[54] Asiatic Jackal *(Canis aureus)* (LC),[55] Bengal Fox *(Vulpes bengalensis)* (VU),[56] Jungle Cat *(Felis chaus)* (NT), Common palm civet *(Paradoxurus hermaphroditus)* (LC), etc.

169. In addition, some species found within the study area are listed in the Schedules of the *Convention on* International *Trade in Endangered Species of Flora and Fauna* (CITES). Those

[54] NT = Near Threatened.
[55] LC = Least Concern.
[56] VU = Vulnerable.

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listed are Common otter *(Lutra lutra),* Common palm civet *(Paradoxurus hermaphroditus),* Common mongoose (*Herpestes edwardsi),* Bengal fox (*Vulpes bengalensis*), Jungle cat *(Felis chaus),* Bengal monitor *(Varanus bengalensis),* dark bellied marsh snake *(Xenocrophis cerasogaster),* Monocelate Kobra *(Naja kaouthia),* Cattle egret *(Bubulicus ibis),* Little Egret *(Egretta garzetta)*, Spotted Owlet *(Athene brama),* etc. But none of these species are known to be in the proposed project sites.

3. Fish Habitat and Distribution

170. Wetlands of Mymensingh District are very significant for both capture and culture fisheries due to the presence of several productive beels, floodplains, channels/ drainage khals and many ponds. The floodplain fishery is important because professional fishers and landless people earned their livelihood by fishing in the open sources of the floodplain. The floodplain fishery is highly diversified.

171. **Distribution of fish habitat in the study area and project area***:* Proposed sites do not contain any fish habitat. The study area as well as the 2-km peripheries of the proposed sites is mainly an urban area. Thus, existence of natural fish habitat is absent except the portion of Old Brahmaputra River which falls within the study area. River is the only natural habitat while ponds are manmade fish habitats. BAU campus consists of several research ponds specially near the Fish Museum and Biodiversity Centre, back side of BFRI Guest House, research ponds within the BFRI boundary, within the BAU Residential Area and near Graduate Training Institute. There are also some small ponds in different parts of the city area.

172. **Fish species diversity:** According to the Department of Fisheries, about 155 fish species were identified in different habitats of the northeast region of Bangladesh. Among them Roho labeo, climbing perch, Stinging catfish, Philippine catfish, Amp barb etc. are found in most of the habitat types. Table 4.10 refers the available fish species within the study area with conservation values.

Table IV.10: Fish Species Diversity and Their IUCN Status

Scientific Name	English Name	Local Name	Habitat	IUCN Status, BD 2015
Labeo rohita	Roho labeo	Rui	B/K/R	LC
Cirrhinus reba	Reba carp	Lachu	B/K/R	NT
Labeo calbasu	Orange fin labeo	Kalibaus	B/K/R	LC
Channa marulius	Great snakehead	Gozar	P/B/K	EN
Anabas testudineus	Climbing perch	Koi	P/D/B/K	LC
Heteropneustes fossilis	Stinging catfish	Shingi	P/D/B/K/R	LC
Clarias batrachus	Philippine catfish	Magur	P/D/B/K	LC
Mystus tengara	Tengara catfish	Tengra	P/D/B/K	LC
Puntius chola	Swamp barb	Puti	P/D/B/K/R	LC
Wallago attu	Wallago	Boal	P/B/K/R	VU
Sperata seenghala	Giant river-catfish	Ayre	B/R	VU
Notopterus notopterus	Bronze featherback	Foli	P/B	VU
Trichogaster fasciata	Banded gourami	Kholisha	P/B/K/R	LC
Macrognathus pancalus	Barred spiny eel	Baim	P/D/B/K	LC
Glossogobius giuris	Tank goby	Baila	P/B/R	LC
Amblypharyngodon mola	Mola carplet	Mola	P/B/R	LC

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Scientific Name	English Name	Local Name	Habitat	IUCN Status, BD 2015
Salmostoma bacaila	Large razor belly minnow	Chella	R	LC
Chanda nama	Elongate glass-perchlet	Chanda	P/D/B/K/R	LC
Lepidocephalichthys guntea	Guntea loach	Gutum	P/D/B/K/R	LC
Acanthocobotis Zonalternans	River loach	Balichata	R	LC
Leander styliferus	Small prawn	Icha	P/D/B/K/R	LC

Note: IUCN Status BD: LC = least Concern; NT = Not Threatened; VU = Vulnerable; EN = Endangered; Habitat: P = Pond; D = Ditch; B = Beel; K = Khal & R = River.

4. Presence of Any Species of Conservation Status Either National or IUCN

173. The project sites do not have any species of national or global conservation status.

5. Initiative for Conservation of Species within BAU Campus

174. BAU has taken an initiative to develop a "Botanical Garden" with a collection of many rare plants (endangered species). It has been developed in a beautiful environment on the banks of the Brahmaputra River covering an area of 25 acres. The garden is open from 2 p.m. to 5 p.m. on Sundays to Thursdays and from 9 a.m. to 5 p.m. on Fridays and Saturdays. Entrance fee is 10 taka (about US$0.10).

175. There are a total of 600 species of trees in this garden which include: thousands of huge trees, 278 medium and 467 small trees. The garden is divided into few zones. The zones have also been named such as herbs, flowers, fruits, cactus, orchids, palms, spices, timber, bamboo, cane, rare, forest plants etc. There are water gardens for aquatic plants, rock gardens for plants that grow in deserts and rocky areas. There are extinct and rare cactus collected from different parts of the country in Nishargo Bhaban. South of the garden is the Orchid House.

176. The Sundarbans trees are in the Sundarbans zone. There are even Sundari, Gewa, Garan, Keora, Pashur, Bain, Hogla and Fern trees. There are rows of rare and endangered cactus in the cosmos (Nishargo Bhaban) building. 'Pot House' is a special archive where medicinal plants like Ashwagandha, Sarpagandha, Gandhabhaduli, Purnanava, Kurchi, Bach, Ulatchandal, Arjunarmul, Anjanetc will be found and there are aromatic plants also.

177. Among the different types of fruit trees from different countries are Star Apple, American Guava, Thai Guava, etc. and flowers include Cambritam, Rhondellia, Palam, Camellia, African Tulip, Ribelietc in the garden. There are also Lotus and Water Lily Lake, Artificial Island, Coconut Corner, Extinct Bamboo Shrubs, etc.

D. Natural Hazards

1. Flooding

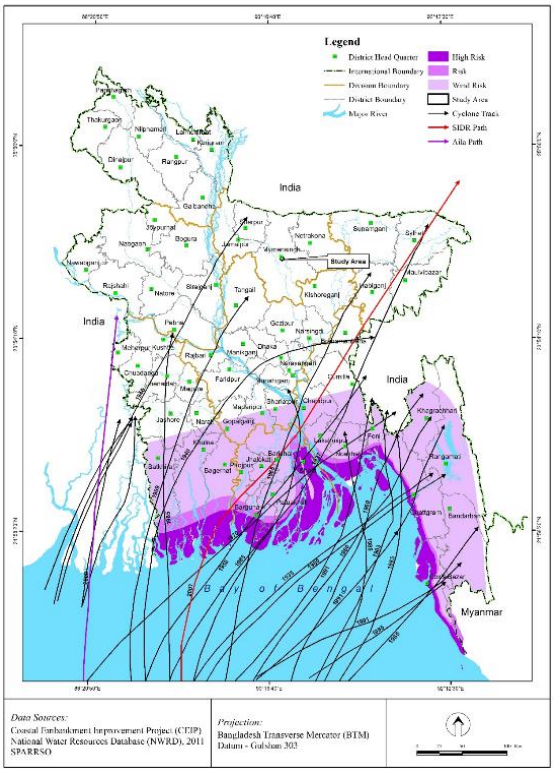
178. According to flood vulnerability map of Bangladesh, the proposed site falls within the “Not Flood Prone Area” (Figure 4.24).

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2. Storm and Cyclone

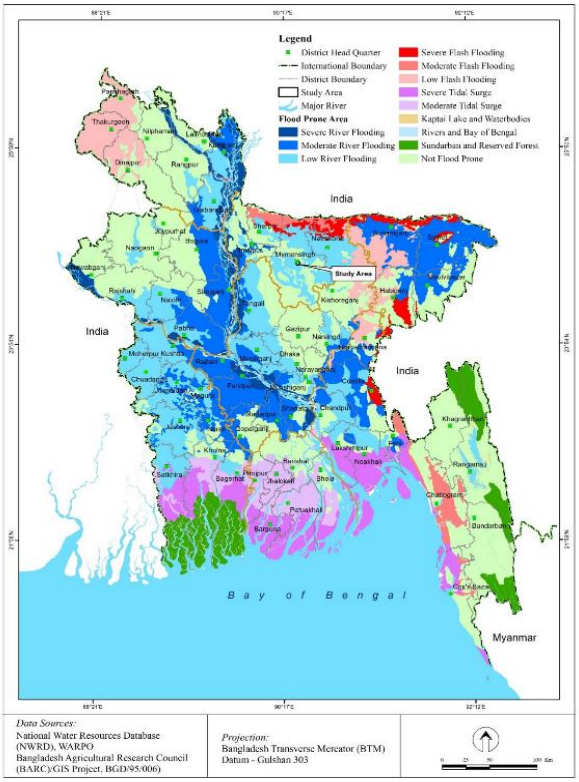
179. There was no significant evidence in the site of historical seasonal storms or wind risks. Based on the Cyclone Affected Area Map of Bangladesh, the site is free from cyclonic effects. (Figure 4.25). Historical data from 1960-2017 recorded by the Bangladesh Meteorological Department did not show that Mymensingh was hit by a cyclone. https://live6.bmd.gov.bd/p/Historical-Cyclones.

Figure IV.24: Study Area within the Flood Vulnerability Map



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Figure IV.25: Study Area on Historical Cyclonic Storm Surges and Cyclone Risk Areas



E. Socioeconomic Conditions

1. Population

180. Total population of Mymensingh District is 5,899,052 where male is 2,897,880 and female is 2,997,931. Out of which rural male is 2,219,365 and female is 2,326,022 (Population and Housing Census, 2022). The proposed site is under Ward 21 of the Mymensingh *Paurashova*. The total population is 8,729 and total households of 1,163 with population density as 2,037 person per square kilometer (BBS 2015).[57]

2. Employment

181. Total employed population of Mymensingh District is 1,665,058 and out of which male is 1,413,430 and female is 251,628. In terms of percentage, 31% people are employed where male is 54.6% and female is 9.37% (Bangladesh Census, 2022). In Ward no 21, total no of population aged 7 years and above who are attending school but employed is 234 (Male 200 and Female 34). Of which, 16 persons are engaged in agricultural activities, five are with industries and 113 persons are engaged in services (BBS 2015).[58]

[57] Community Report; Zila: Mymensingh; Bangladesh Population and Housing Census 2011; Bangladesh Bureau of Statistics (BBS), 2015, pp-103-104.

[58] Community Report; Zila: Mymensingh; Bangladesh Population and Housing Census 2011; Bangladesh Bureau of Statistics (BBS), 2015, pp-831.

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3. Literacy

182. Literacy rate of Mymensingh District total is 70.74% where male and female are 72.74% and 69.41%, respectively (Population and Housing Census, 2022). Literacy rate within aged 7 and above of Ward No 21 in Mymensingh City is 85.3% (male 89.5% and female 79.3%) (BBS 2015).[59]

4. Water Supply and Sanitation

183. Drinking water sources are of different categories such as tap water, tube well, bottled/jar and others, and in terms of percentage, these are: 1.9%, 97.82%, 0.07% and 0.24%, respectively (Bangladesh Census, 2022). The proposed project site has piped water supply through the BAU Authority and the Mymensingh *Paurashova*.

184. The sanitation facilities of Mymensingh District consist of five categories. The different categories are safe disposal (42.66%), unsafe disposal (18.62%), pit with slab (23.9%), open pit (7.77%) and open latrine (7.05%) (Bangladesh Census, 2022).

185. Households within Ward 21 of Mymensingh City as well as the surrounding within the proposed project site have 58.8% water sealed sanitary toilets while 18.6% households have non-water sealed sanitary toilets. More than 22% households use non-sanitary toilets (BBS 2015).[60] Solid waste management at the proposed project site within the BAU and surrounding areas is managed by the Mymensingh City Corporation (*Pauroshova*).

5. Infrastructure and Telecommunications

186. Proposed project site is connected to the city roads through the metaled roads of BAU. The Mymensingh City roads are well connected to the regional and national roads.

187. Both mobile and land telecommunication networks are available at the site. In the Mymensingh District, 49.92% of the population relate to mobile phone and 20.25% relate to internet (Bangladesh Census, 2022).

6. Housing

188. Housing types are: i) Pucca, ii) Semi-pucca, iii) Kutcha, and iv) Jhupri. Out of these categories, 8.68% is pucca, 18.82% semi-pucca, 72.04% Katcha, and 0.45% Jhupri (Bangladesh Census 2022). Ward 21 of Mymensingh City has 57.4% pucca households and 13.2% semi-pucca households. Kutcha and Jhupri are 24.1% and 5.2%, respectively (BBS 2015).[61]

[59] Community Report; Zila: Mymensingh; Bangladesh Population and Housing Census 2011; Bangladesh Bureau of Statistics (BBS), 2015, pp-503.
[60] Community Report; Zila: Mymensingh; Bangladesh Population and Housing Census 2011; Bangladesh Bureau of Statistics (BBS), 2015, pp-999.
[61] Community Report; Zila: Mymensingh; Bangladesh Population and Housing Census 2011; Bangladesh Bureau of Statistics (BBS), 2015, pp-999.

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7. Physical Cultural Resources

189. No physical, historical, cultural heritage or intangible cultural heritage sites as defined by SPS 2009 were reported or identified within a perimeter of 500 m from the proposed project sites.

8. Public Health

190. The Mymensingh Sadar Upazila has one health complex, five hospitals, 13 family welfare centers, and three satellite clinics. The Mymensingh Medical College and Hospital is the biggest public hospital in Mymensingh District having around 2,000 beds capacity with qualified doctors and modern equipment to support critical patients. The patients from different upazilas come to this hospital for better treatments particularly for the critical patients requiring ICU support.

191. Major diseases are diarrhea and gastroenteritis of presumed infectious origin followed by pneumonia (unspecified), typhoid fever, acute bronchiolitis, asthma (Local Health Bulletin 2016 for Mymensingh Civil Surgeon Office).[62]

9. Health Facility and Staff

192. Most of the health services are available during the emergency period at the government and recognized private health care centers within Mymensingh City. In addition to that, BAU campus has a medical facility with qualified doctors and supporting staff for emergency treatments of the students and employees.

10. Disaster and Emergency Preparedness

a. Fire Brigade Station and District Disaster Management Facility.

193. There is a government-managed fire brigade station within 300 meters from the proposed project site and the BAU emergency management responsible team have close communication with the nearby fire station for any emergency support services. Apart from the fire brigade station, BAU emergency management team has also provision to get support from district disaster management team for any emergency need.

b. BAU Medical facility

194. BAU has an on-campus health care center at the level of an outdoor hospital for treatments and investigations including emergency diagnosis facilities such as X-Ray, ultrasonogram, ECG, blood test of 42 items (details of the pathology tests conducted at BAU). There is also a dental unit providing services such as prophylaxis, filling, scaling, extraction, root canals and management of other dental problems for BAU employees and students.

195. BAU also maintains a diabetic unit for management of diabetic patients with a capacity of 25 beds including isolation beds for infectious diseases such as chicken pox, mumps, etc. All medicines for students are supplied free of cost by the BAU authority. There are two emergency ambulances to support patients for 24 hours.

[62] Local Health Bulletin 2016 for Mymensingh Civil Surgeon Office, Mymensingh Sadar, Mymensingh.

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196. The medical facility has four post graduate trained specialist, 8 graduate doctors (Bachelor of Medicine and Bachelor of Surgery), 8 medical technologists, and 12 supporting staff. The government-owned Mymensingh Medical College and Hospital is located within 6 km from the BAU on-campus medical facility and can be accessed, if needed, based on the emergency.

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V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Screening and Scoping

197. Assessment of the potential environmental impacts was based on the project's area of influence (PAI) described as the project sites of the new buildings (about 4.5932 hectare) and the area within 2-km radius from the project sites (includes the existing academic facilities for renovation/refurbishment).

198. **Screening.** At the initial stage of project planning, the potential environmental impacts were screened using the ADB's rapid environmental assessment (REA) checklist to determine the environment category and scope of the environmental assessment. The REA screens against parameters such as air, water, land, biodiversity, waste, climate change, geological hazards, and community and occupational health and safety. Given the nature and scale of proposed project interventions, the project is classified as category B on environment under SPS 2009 requiring an IEE.

199. Under the national environmental requirements provided for in ECR 2023, the project is anticipated to be orange category based on similar nature of projects listed in Schedule 1 [i.e., housing and urbanization project, and residential and commercial building of up to 5,000 square meters (m^2) to 20,000 m^2 built up area]. The total footprint of the new buildings is about 12,800 m^2, thus, it is anticipated that the project will be category orange requiring an IEE. As orange category, a locational clearance certificate (LCC) and an ECC from the DOE will be required. This draft IEE will be submitted to the DOE to confirm the orange category and to apply for the LCC and ECC.

200. **Scoping.** This is the process of identifying the critical environmental impacts out of the possible environmental impacts of a development project. Evaluation of potential impacts cover the project cycle stages - pre-construction/design, construction, post-construction, and decommissioning. Scoping considers the issues that are likely to be most important in each stage of the project cycle from those that may be of little concern, and the activities that need to be carried out in the assessment.

201. **Level of significance.** Common criteria in evaluating significance are magnitude of the potential impact and the sensitivity of the receiving environment. Magnitude considers the characteristics of the change (timing, scale, size, and duration of the impact) which may probably affect the target receptor because of the proposed project. Sensitivity of the receptor refers to the receiving environment to change, including its capacity to adapt to the project impacts.

Table V.1: Potential Environmental Impacts - Scoping

Potential Impacts	Project Stage			
	Pre-construction/design	Construction	Post-construction	Decommissioning
Physical Environment				
Increased level of dust	-	-	-	-
Increased noise level	-	-	-	-
Generation of waste	-	-	-	-
Water consumption	-	-	-	-

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Potential Impacts	Project Stage			
	Pre-construction/design	Construction	Post-construction	Decommissioning
Degradation of water quality	-	-		
Erosion/land clearing	-	-		-
Biological Environment				
Clearing of vegetation	-	-		-
Loss of habitat	-	-		
Greening and landscaping		+	+	+
Human Environment				
Creation of jobs	+	+	+	+
Movement of workers and labor camps	-	-		-
Community safety risks	-	-	-	-
Occupational health and safety	-	-	-	-
Disaster and emergency	-	-	-	-
Traffic	-	-	-	-
Change in landscape – presence of new building			+	

Note: (-) negative impact, (+) positive impact, blank/shaded – no impact.

202. Based on the screening and scoping, the potential impacts were identified to be mainly during the pre-construction, construction, and decommissioning stages. The identified impacts and mitigation measures according to project activity are discussed in the following sections.

B. Pre-construction and Design Stage

203. The activities at this stage include the preparation of project proposal updates, design of the new building, desktop and ground surveys of the proposed site, geotechnical investigations preliminary consultations. These activities are not expected to have significant environmental impacts as the activities will have minimal physical disturbances to the environment.

a. Survey and Design of Existing Building for Renovation/Refurbishment

204. Potential impacts of this activity are disruption of services and inconvenience to the users of the classroom, library, auditorium and sports facilities. Disruption to daily university activities of students, faculty and staff may occur in other existing academic buildings selected for renovation/refurbishment. Measures to address this impact include (i) informing the building administrators on the scope and schedule of works, (ii) post clear and visible signs about the schedule of the daily works to be done, (iii) require the contractor to conduct a rapid assessment survey for presence of asbestos or asbestos-containing materials (ACM) in the existing academic facilities that will require dismantling, and (iv) in consultation with building administrators, prepare a dismantling plan for approval by the PIC and PMU.

205. In case there is asbestos or ACM, the contractor will be required to implement the following measures:

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(i) Engage a certified asbestos service provider to prepare an asbestos management plan to identify, remove and dispose the material from the buildings;[63] and
(ii) Comply with relevant national regulations and adopt international best practices such as those given in the WB-IFC EHS General Guidelines 2007 on Occupational Health and Safety, the Safe Work Practices for Handling Asbestos by WorkSafe BC, or the US EPA.

206. No dismantling works will commence in the area where asbestos and ACM have been identified prior to the approval of the asbestos management plan by the PIC and PMU.

207. There are 17 buildings identified to be included in the renovation and refurbishment component of output 1 (see Table 3.2). A consultant conducted an inspection/audit in March 2024 of the 17 buildings using checklist to identify potential environmental concerns (see Appendix 3). The years these buildings were built and/or started operation range from 1960 to 2003. Based on the checklists, key concerns are on health and safety (i.e., conditions of toilets, poor lighting and ventilation, poor or lack of resources on emergency preparedness such as fire extinguishers, safety signs, procedures, etc.), waste management (i.e., lack or inadequate bins for waste disposal, lack of waste reduction program, etc.), energy and water management (i.e., lack of energy and water conservation measures, efficient lighting system, etc.). A corrective action plan is given in Appendix 4. Most of the corrective actions required are already considered as part of output 1 and a total of about $9.82 million (BDT10,800 lakh) is included in the project costs to cover the renovation and refurbishment of these buildings.

b. Site Survey and Design for the New Buildings (BICAR, HCDI and IIFS)

208. Site survey, movement of vehicles and equipment may cause disruption to the daily activities and inconvenience to students in Isha Kha Halls, users of Isha Kha Hall Mosque, Kharim Bhaban building, and the immediate vicinity of the project site in BICAR. The contractor will coordinate with administrators of buildings that may be affected on the schedule of works that can potentially disrupt them and will install clear and visible signposts to alert local people about the ongoing site survey works.

209. Poor or inappropriate design may cause failure of the new buildings to withstand climate change and natural hazards and may pose safety and health risks to students and building users.

210. To ensure the safety and health of the building users, the following measures will be implemented:

- Compliance to relevant requirements from the Bangladesh National Building Code (BNBC) 2020
- Incorporate green building features provided for in Part III, Chapter 4 (energy efficiency and sustainability) of the BNBC 2020 such as maximizing the available natural light, use of energy-efficient lighting and cooling systems, rainwater harvesting, water-efficient plumbing, installation of solar rooftop PV systems, and

[63] Refer to ADB Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (March 2022).

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use of building concepts that have positive environmental impacts and to encourage sustainable construction practices

- Incorporate disaster risk reduction and climate change adaptation measures for cyclone, drought, earthquake, etc.
- Relevant codes and standards from international entities such as IEC, UL, ASTM, ASCE, World Green Building Council, International Code Council, International Building Code will be referred to while the applicable codes and standards such as wind and seismic loads from the Bangladesh National Building Code 2020 will be followed and reference will be made to organizations such as the American Society of Civil Engineers, US Green Building Council, and the IFC's Excellence in Design for Greater Efficiencies (EDGE) for the design of the green building features.

211. BAU, who will implement the project, does not have staff to oversee the environmental aspects of project implementation. To ensure that environmental aspects are considered, and relevant environmental requirements are complied, the project implementation committee (PIC) in BAU will designate a staff to coordinate with the environmental safeguard consultant from the project management unit (PMU). The PIC will undergo orientation training on the requirements and compliance under SPS 2009, EDCF, and ECR 2023. Alternatively, the PIC may consider engaging an intermittent environmental consultant instead of assigning staff with only general background and experience.

c. Proper Project Documentation

212. **Secure relevant permits, consents.** Failure or delay in securing the required permits such as the no objection certificate (NOC), LCC and ECC from the DOE at this stage, may cause potential delay and/or stoppage of project implementation. The PMU and PIC will ensure that all the permits required prior to pre-construction and construction works will be obtained. A staff from the PMU will be designated to oversee the timely issuance of permits.

213. **IEE/EMP in Bid Documents.** Failure to include the IEE/EMP in the bid documents may result in the exclusion of the EMP in the cost estimates of the bidders. Also, some contractors are not familiar with the need for environmental management measures and as a result may give a lower budget resulting to implementation not based on design or budget deficit. Thus, those responsible for the preparation of bid documents (e.g., PMU, PIC, design consultants, etc.) will ensure inclusion of the IEE/EMP in the bid documents. An orientation on the EMP requirements during the pre-bid meeting will help bidders. The environmental consultant to be engaged will provide the technical support in ensuring that environmental aspects are incorporated in the bid documents and also in evaluating the bids.

214. **IEE/EMP update.** This IEE was based on the Feasibility Study (November 2023) and the revised DPP (May 2024) prepared by the government. There is a need to update the IEE based on the latest detailed design to ensure that impacts and mitigation measures are also updated. The revised/updated IEE will be submitted by the PMU to ADB for review and disclosure to ADB website as required by SPS 2009 and Access to Information Policy (AIP) 2018.

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d. Stakeholders' consultation

215. Consultation continues during project implementation. Lack of or limited consultation and participation of affected persons and key stakeholders may give rise to potential cause for complaints/grievances from students, faculty, and staff of BAU as well as other residents or parents of students in Isha Khan Hall for the HCDI and IIFS building. The BICAR site is a vacant lot and relatively far from other academic buildings. The PMU and PIC together with the contractor will conduct townhall meetings to inform residents directly or indirectly affected about the progress of project implementation. A record of concerns and issues raised during consultations will be included in the environmental monitoring report (EMR) to be submitted by the PMU to ADB semi-annually during construction and annually post-construction, and submission of EMR needs to continue until project completion report is issued by ADB. The EMRs are publicly disclosed to the ADB website.

e. Selection of Sites for Storage of Construction Materials, Construction Camp, Waste Disposal, etc.

216. Site selection for storage of construction materials, construction camp, borrow areas, etc. will consider environmental implications of the site to avoid potential environmental impacts. The World Bank indicates that in 2020, it was estimated that the waste generated per person per day averages 0.79 kilogram.[64] Also, the WHO states that the water requirement per person per day is between 50 and 100 liters to ensure that most basic needs are met, and few health concerns arise.[65] These criteria will be considered and incorporated in planning and selecting for the temporary collection and waste disposal site, and in providing safe water supply to workers. Aside from these, environmental aspects in site selection such as proximity to a water body, existing land use (i.e., residential, institutional, etc.), existing sources of noise and air pollution, general topography and potential for erosion will be considered. The contractor will also consider the guidance on workers' accommodation issued by the IFC and EBRD (2009).[66]

217. Other mitigation measures for site selection of storage area include: (i) securing the area to prevent pilferage and incidence of crime, (ii) provision of clear and visible warning signs around the area, (iii) provision of firefighting system, (iii) lining of impervious material to areas where fuel, oil, and lubricants will be stored, and (iv) persons responsible to manage the storage area will be provided with appropriate training and orientation on the proper handling of these materials and compliance to health and safety rules.

f. Disruption of Utilities within the Site for the New Buildings (BICAR, HCDI and IIFS) and Academic Facilities to be Renovated/Refurbished

218. Geotechnical investigations at the sites for the new buildings may disrupt utilities causing inconvenience to other existing users. To avoid any issue, the contractor will identify or map the existing utilities within the project sites and coordinate with relevant government authorities on the requirements for utility disruption. Also, inform residents and other users of the potential

[64] World Bank. 2022. Solid Waste Management.
[65] WHO. The Human Right to Water and Sanitation. Media Brief.
[66] IFC and EBRD. August 2009. Workers' accommodation: processes and standards, Public guidance note by IFC and the EBRD.

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disruption and the action to be taken to minimize inconvenience. If needed, compensate the affected users.

g. Biosafety in BICAR

219. BICAR will have one biosafety level 2 laboratory and one biosafety level 3 laboratory in building 1 (Laboratory Building). The animal experimentation facility will have a biosafety level 2+ laboratory. Failure to design or to fully incorporate the safety requirements for biosafety laboratories in accordance with national and international standards may pose health risks to BAU community. To minimize the health and safety risks, the design of Building 1 and the animal experimentation facility will refer to the Bangladesh biosafety regulations and requirements, BNBC 2020, the WHO Biosafety Manual 4th Ed. 2020, and to be aligned with the requirements of the Cartagena Protocol as well as the guidelines of the Korean government. The matrix below (Table 5.2) presents the terms of compliance for installation criteria and operating standards recommended by EDCF (i.e., *Integrated Notification of the Act on the Transfer of Genetic Variants between Countries* [Attachment 9-1]):

Table V.2: Terms of Compliance to Biosafety on Installation and Operation

Installation Criteria

Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
Laboratory Location and Access	Laboratory (Experimental Zone): Separated from General Zone	R	R	M	M
	Installation of main entrance lock system (card, fingerprint recognition system, security system, etc.)	R	R	M	M
	Installation of personal clothing and laboratory clothes storage before entering the laboratory	R	R	M	M
	Laboratory access: Installation via entrance, front room, etc.	-	R	M	M
	Installation of doors or areas for incoming and outgoing of equipment	-	R	M	M
	Installation of door mutual opening prevention devices in the area (manual operation possible)	-	-	M	M
	Entrance: Installation of doors capable of air expansion or compression sealing	-	-	R	M
	Installation of conditioning equipment near the enclosed area	-	-	R	M
	Enclosed facilities: A separate experimental building surrounded by concrete walls (grade 4 research facilities reflect seismic design)	-	-	R	M
	Space for maintenance of research facilities		-	M	M
Experiment Section	Inside the enclosed area: Use of materials capable of chemical sterilization and fumigation	-	-	M	M
	Walls inside the enclosed area: Use materials that guarantee sealing, such as concrete.			R	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	Joint in enclosed areas: Use of non-hardening sealants that allow complete enclose of facilities	-	-	M	M
	Installation of HEPA filter when installing vacuum pump lines supplied from outside	-	-	M	M
	Interior wall: Installation to avoid distortion or damage to pressure 1.25 times the set pressure during design	-	-	-	M
Air Adjustment	Air inside the enclosed area: always Maintain sound pressure and prevent recirculation	-	-	M	M
	Pressure difference between outside and maximum sound pressure zone: -24.5 Pa or more (±30% fluctuation allowed)	-	-	M	M
	Facility ventilation: at least ten times per hour (at least twenty times for level 4 research facilities)	-	-	M	M
	Installation of the air supply system in conjunction with the exhaust system	-	-	M	M
	Installation of HEPA filter in air supply duct (Mandatory for Animal zone)	-	-	R	M
	Installation of HEPA filters in exhaust ducts (In case of level 4 research facilities, installation of HEPA filters in two stages)	-	-	M	M
	Installation of spare exhaust filter box	-	-	R	M
	Installation back draft damper (BDD) in the exhaust duct			M	M
	Installation of airtight type damper at the front end of the exhaust HEPA filter (In case of level 4 research facilities, installation of bubble tight damper or comparable damper)	-	-	M	M
	Ducts and exhaust HEPA filter boxes at the front end of the exhaust HEPA filter: level 3 research facilities resist pressure of 1,000 Pa or more for 30 minutes (within 10% leakage), level 4 research facilities resist pressure of 2,500 Pa or more for 30 minutes (within 1% leakage).	-	-	M	M
Experimenter Safety Protection	Installation of hand sanitizers and eye cleaners (excluding eye cleaners for suit type level 4 research facilities) in the experiment area or inside the laboratory	-	R	M	M
	Installation of emergency shower facilities in enclosed areas (excluding suit type level 4 research facilities)	-	-	M	M
	Installation of a chemical shower device for removing contaminated laboratory clothes	-	-	-	M
	Installation of positive pressure suit and compressed air breathing apparatus (excluding cabinet type level 4 research facilities)	-	-	-	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
Experiment Equipment	Installation of high-pressure sterilizers (for research facilities of level 3 and 4, installation of double-door high-pressure sterilizers)	M	M	M	M
	Installation of a biosafety workstation	-	R	M	M
	Using a centrifuge with the ability to prevent aerosol from leaking to the outside	-	R	M	M
	Installation of breeding equipment including air supply and exhaust systems with HEPA filters when using animals (separate duct connection) (In case of level 4 research facilities, installation of HEPA filters in two stages)	-	R	M	M
Waste Disposal	Solid waste: Installation of equipment such as high-pressure steam sterilization or chemical treatment to remove biological activity	R	M	M	M
	Experimental wastewater: Installation of equipment that can remove biological activities such as high-pressure steam sterilization or chemical treatment (In the case of level 4 research facilities, installation of high-pressure steam sterilization equipment)	R	M	M	M
	Exhaust by HEPA filter (In case of level 4 research facilities, installation of HEPA filter in two stages)	-	R	M	M
Other facilities	Installation of communication equipment connected to the outside of the facility	R	R	M	M
	Installation of backflow prevention devices in piping	-	R	M	M
	Installation of nozzles for the detoxification and test of HEPA filter	-	-	M	M
	Installation of observable internal pressure measuring instruments and alarms	-	-	M	M
	Installation of spare power supply facilities for air conditioning and essential facilities in case of power outages	-	-	M	M
	Installation of carbon filters in exhausts in areas where odors may occur a lot, such as animal testing areas	-	R	M	M

Source: DPP April 2024.

Operating Standards

Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
Access to Experiment Area	Laboratory doors are always closed, and only authorized access is allowed.	R	M	M	M
	Keeping and recording the access list	-	R	M	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	Equip and use of protective equipment such as laboratory clothes	R	R	M	M
	Attach a biosafety sign (name of genetically modified organism, safety management level, name and contact information of facility manager, etc.) in front of the entrance.	R	M	M	M
Activities in Experimental Area	Conduct experiments only in designated areas and wash hands after completion or when leaving the laboratory	M	M	M	M
	Wear a lab coat in the experimental area and take off the lab coat when moving to the general area.	R	M	M	M
	Using mechanical pipettes during experiment	M	M	M	M
	Minimize aerosol generation during experiments	R	M	M	M
	Prohibition of food intake, food preservation, smoking, and makeup in the experimental area	M	M	M	M
	Prohibition of bringing non-experimental items such as plants, animals, clothes in the experimental area	R	M	M	M
	When transporting infectious substances, convey them in a tightly sealed container.	-	R	M	M
	Prepare management measures for insects and rodents	M	M	M	M
	Disinfect the workstation after the experiment (disinfect immediately if contamination occurs during the experiment)	-	M	M	M
	Remove lab coat and remove contamination with shower when leaving the laboratory	-	-	R	M
Securing Biosafety	Place of storage of genetically modified organisms (refrigerator, freezer, etc.): Attachment of "Biohazard" mark.	M	M	M	M
	Organization of the Biosafety Committee and Nomination of a Director of Biosafety Management	R	M	M	M
	Designation of biosafety manager	R	R	M	M
	Implementation and completion of biosafety education	R	M	M	M
	Management and maintenance of records related to the installation and operation of research facilities	M	M	M	M
	Preparation and storage of GMO storage management ledger	M	M	M	M
	Recording, reporting, and keeping records of experimental infections	-	R	M	M
	Preparation and application of biosafety management regulations (In case of level 3, 4 research facilities, prepare facility operation rules)	R	M	M	M
	Opening of items containing infectious substances: Performed on physically enclosed equipment such as	-	R	M	M

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Terms of Compliance		Safety Management Grade (R-recommended, M- mandatory)			
		BSL 1	BSL 2	BSL 3	BSL 4
	biological safety workstations				
	Collection and storage of normal serum for test and research workers (periodic serum collection and medical examination if necessary)	-	R	M	M
	Inoculate if vaccine is available for handling pathogens	-	R	M	M
Waste Disposal	Contaminated waste before treatment: store in a separate safe place or container	R	M	M	M
	Disposal of all waste (including straw) by eliminating biological activity	R	M	M	M
	Establishment of regulations on the disposal of experimental waste	M	M	M	M

Source: DPP April 2024.

C. Construction Phase

220. Before the start of construction works, the contractor will be informed by the PIC and the PMU of the responsibility to compensate for any temporary damage, loss, or inconvenience resulting from accident or failure to comply with the regulations in implementing the project. Also, the contractor will be required to conduct environmental quality measurements for air, noise, vibration, and drinking water to be provided to construction workers. The results of measurements will be included in the EMR.

1. Prepare Construction Environmental Management Plan

221. The contractor will be required to prepare a construction environmental management plan (CEMP) prior to construction to prevent the potential impacts from unplanned activities, and to organize activities for smooth project implementation. The CEMP is subject to approval by the PIC and PMU.

222. The CEMP will include, but not limited to the following:

(i) Construction site regulations (i.e., workers' code of conduct, working hours, use of PPEs, prevention of SEAH, etc.)
(ii) Occupational health and safety plan
(iii) Temporary routes for pedestrians (if needed) and traffic management plan to minimize disturbance from movement of construction vehicles, equipment, and workers
(iv) Spoils disposal and construction waste management
(v) Noise and dust control
(vi) Drainage and stormwater management plan to ensure that construction works will not cause ponding or flooding at project construction site, storage area and construction camp
(vii) Materials management plan

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(viii) Community health and safety plan
(ix) Emergency/disaster preparedness and response, designate staff as Incident Coordinator – evacuation or assembly point
(x) Measures and/or preparedness plan for outbreak of communicable diseases such as COVID-19 (e.g., arrangement to medical clinic or hospital, availability of ambulance, etc.)
(xi) Designate staff as list of contact details during emergency to workers or post in billboards at construction site
(xii) Inclusion of GRM to handle potential complaints.

2. Recruitment of Project Staff and Workers

223. Construction stage will create jobs but may also cause discrimination over local labor and migrant workers. It may also result to resentment over the process and transparency of recruitment. The contractor will be required to give priority to local labor and to monitor the recruitment process to ensure transparency and fairness. A record of workers' details such as phone number, local address, and email (if any) will be maintained in case of another outbreak of COVID-19 or other communicable diseases.

224. With construction works, it is expected that there will be workers and project staff within the premises of BAU particularly near Karim Bhavan, and Isha Khan Halls. The contractor (and their subcontractors) will be responsible for enforcing the project site regulations and to ensure that their workers strictly observe the rules and regulations of BAU. There will be zero-tolerance for workers' non-compliance to project site regulations. The PIC and PMU will monitor the compliance to the relevant provisions in the Bangladesh Labor Act 2006 (as amended 2013) and Bangladesh Labor Rules 2015 on recruitment and working conditions including ADB's Core Labor Standards.[67]

3. Briefing of Contractor, Workers, and Project Staff Environmental Requirements

225. Lack of understanding of the EHS requirements and being unfamiliar with the roles and responsibilities in implementing the EMP, and the need to comply with applicable rules and regulations of BAU, ADB, and the government may create a workplace inconsiderate to environmental management. To improve awareness, the PMU, PIC together with the environmental safeguard consultant in the PMU will conduct an orientation and training on the EMP, records management, compliance and environmental reporting required by ADB, and the consequences to the project of non-compliance to the requirements of the government and ADB. Topics to be included (but not limited to) will be "chance find" procedures, grievance redress mechanism (GRM), emergency preparedness, health & safety plan, sexually transmitted diseases such as HIV/AIDs, COVID-19 prevention measures, and orientation and prevention of sexual exploitation, abuse, and harassment (SEAH) in ADB-financed projects with civil works[68] focusing on education project.

[67] ADB. 2006. ADB Core Labor Standards Handbook.
[68] ADB. 2023. Good Practice Note on Addressing Sexual Exploitation, Abuse, and Harassment in ADB-Financed Projects with Civil Works.

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226. An emergency and disaster coordinator, and an environmental and occupational health and safety (EOHS) officer will be designated by the contractor to oversee emergency procedures in case of emergency or disaster. The EOHS officer will oversee compliance to environmental and occupational health and safety requirements. Emergency mock drills will be conducted regularly, and participation of workers and project staff will be mandatory. Building administrators of Karim Bhavan, Isha Khan Hall and mosque will be informed of the mock drills schedule. Resource persons from relevant government authorities will be invited to conduct training on emergency and disaster preparedness and OHS at least once a year.

227. The contractor (and their subcontractor) will be responsible to ensure that their workers and staff are fit to work.

4. Environmental Quality Measurements

228. The contractor will conduct measurements on air quality, drinking water quality, noise, and vibration before the start of construction works. Details of parameters to be measured and recommended sampling stations are given in the EMOP (Table 9.5).

229. Setting-up of equipment necessary for measurements may cause temporary inconvenience to students and other local people. To minimize disruption, PIC will be informed of the schedule and sampling and setting-up equipment will be organized to minimize disruption. Improper methods of sampling may result in inaccurate results. Standard methods of sampling will be followed, and results will be included in the monthly report submitted to the PIC and will be reference data prior to construction works.

5. Selecting Source of Materials

230. Construction of the new building will require aggregates and the quarries to supply the required volume may alter landscape and riverbeds. Aggregates will be sourced only from quarries with ECC issued by the DOE and if procured from 3rd parties, the contractor will be required to provide a copy of the ECC to the PIC.

231. It is not recommended that the contractor operate a new quarry to meet the requirements of the new building. However, if the contractor decides to operate a quarry, the necessary permits and clearances from relevant government agencies will be secured before quarrying is done and will ensure that the quarry is maintained in a stable condition, appropriately and adequately landscaped, and when taken from the river, should not disrupt the flow of river or damage the riverbanks causing erosion.

232. The contractor will be required to identify the sources of water that will be used during construction. Permits that may be required by relevant government agencies such as the Bangladesh Water Development Board will be provided to the PMU as part of project compliance documentation. Groundwater from new tubewells in Mymensingh will not be allowed given the lowering of the water level starting December to May.

6. Set Up Construction Camp, Construction Stockyard, and Construction Site Office

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233. Poor siting and inadequate sanitary facilities may pose occupational and safety risks to workers and degradation of the local environment. Construction camp and construction stockyard within the construction site of the new HCDI and IIFS compared to the BICAR site may cause greater disruption to the students and staff of BAU, increased noise and dust levels, and waste generated. Measures to prevent this impact are given below.

234. In addition to the factors to be considered in site selection, other measures include the following:

(i) Consultation with local community
(ii) Avoidance of agricultural or cultivated land
(iii) Preference for government-owned land
(iv) Use of private land to be rented fairly to the landowner
(v) Construction camp should not be within BAU or close to sensitive areas such as hospital, mosque, etc. and sensitive habitat such as river, any khal or beel
(vi) Sites will be approved by PIC and PMU

235. Construction camps will be provided with the following[69] :

(i) Safe and adequate water supply, sanitation, and electricity
(ii) Security personnel and fence/enclosures to prevent unauthorized access
(iii) Registry to monitor the number of persons in the camp at any given time
(iv) Septic tank/soak pit of adequate capacity to accommodate the residents
(v) Adequate fuel for cooking
(vi) Health care arrangement with local medical providers in case of illness or accident. BAU has a medical facility that can also provide medical assistance
(vii) Adequate first aid kits for non-emergency needs
(viii) Preparations in case of COVID-19 incidence or other communicable diseases
(ix) Adequate garbage bins for segregated waste and arrangement for regular collection and disposal
(x) Firefighting system and emergency procedures
(xi) Adequate drainage facilities to prevent stagnant water

236. Construction site office will be provided with the following:

(i) Safe and adequate water supply, sanitation, electricity, and designate safety personnel
(ii) Septic tank/soak pit of adequate capacity to accommodate the staff
(iii) Adequate first aid kits for non-emergency needs
(iv) Health care arrangement with local medical providers in case of illness or accident. BAU has a medical facility that can also provide medical assistance
(v) Preparations in case of COVID-19 incidence or other communicable diseases
(vi) Adequate garbage bins for segregated waste and arrangement for regular collection and disposal
(vii) Firefighting system and emergency procedures.

[69] Refer also to No.6 ILO Helpdesk. Workers' accommodation: processes and standards. Public guidance note by IFC and the EBRD August 2009.

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237. In planning for the sanitary facilities in the construction camp and construction office, the contractor needs to consider that the optimal water requirement per capita of 100 liters per day which covers for hydration and sanitation food preparation, laundry and hygiene. As well to consider the average general waste generation in Bangladesh per capita of 0.79 kilogram (kg) per day or the more specific waste generation of 0.5 kg per day for solid waste, 0.34 kg hazardous waste per day, and 0.011 kg e-waste per day.

238. Construction stockyard (workshops, equipment wash area, material storage, haul routes and waste disposal) will have the following:

(i) Adequate water supply, sanitation, and electricity
(ii) Separate toilets for male and female workers and staff
(iii) Septic tank/soak pit of adequate capacity to accommodate the staff.
(iv) Health care arrangement with local medical providers in case of illness or accident
(v) Preparations in case of COVID-19 incidence or other communicable diseases
(vi) Adequate garbage bins for segregated waste and arrangement for regular collection and disposal
(vii) Firefighting system, first aid kit, and PPEs (helmets, goggles, earplug, safety belt, etc.) and emergency procedures.
(viii) Paved area for fuel and lubricant storage and unloading, equipment and machinery repair workshop, etc.

239. Respective government agencies will be informed prior to any site development works to identify the connections of utilities such as natural gas pipelines, water pipes, sewers, telecommunications, and other services that may be affected. Storage area will be secured to prevent unauthorized access.

7. Site Development

240. Site development involves land and minimal vegetation clearing, excavation works, use of heavy equipment and machinery, movement of construction vehicles and workers, and other construction-related activities that may cause impacts to people and the environment. The followings impact identified and given below:

Land and Vegetation Clearing

241. There are about 20 shrubs of height less than 10 m and approximately 4 inches or less diameter at breast height (Figure 5.1). This vegetation in the site for the HCDI and IIFS new building will be cleared. There is no known terrestrial flora and fauna in the project sites that are of national or global conservation status. Landscaping and keeping a green space will be undertaken once construction works will allow it. The existing shrubs can be balled and transferred to an appropriate site for use during the landscaping. The contractor will be required to include in the CEMP measures of handling the shrubs prior to site clearing.

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Figure V.1: Existing Vegetation in the HCDI and IIFS Site



Disruption of Daily Activities within the Construction Site

242. Site development will disrupt and may cause inconvenience to students, faculty, and staff of BAU particularly in Isha Kha Hall East and West, Isha Kha Hall Mosque, and other people due to movement of construction vehicles and heavy equipment, increased noise and dust levels, vehicular emissions, transport of construction materials, and disposal of waste. Measures to minimize disruption include (i) strict implementation of CEMP approved by the PIC and PMU, (ii) informing authorized staff in BAU about the construction work schedule, (iii) aside from the CEMP, the contractor may refer to the environmental code of practice (Appendix 5).

"Chance Finds" during Excavation and Earth Moving Works

243. The project sites cover about 6.43 hectares and is not known to have archaeological and historical value. Since excavation is involved, "chance find" procedures are included in Appendix 5 in case an encounter of physical cultural resource occurs.[70]

Community Health and Safety Risks

244. To minimize the health and safety risks to the immediate community within the construction site, the following measures will be implemented:

(i) Mark areas excavated and provided clear and visible warning signs.
(ii) Install appropriate enclosures in excavated areas.
(iii) Provide alternative routes and crossings to local people with clear and visible safety signs accommodating elderly, children, and people with disability.

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

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(iv) Provide temporary enclosures or fences (at least 2 m high), adequate lights, clear and visible warning signs, and danger signals, and take all precautions identified in the community and safety plan of CEMP
(v) Post visible and clear signs on COVID-19 or common communicable diseases to continue awareness and vigilance of the community
(vi) Designate security personnel to prevent accidents, unauthorized access, and to deter pilferage
(vii) Extended parking time of construction vehicles along side streets in the project site will not be allowed
(viii) Contractor will be required to rehabilitate immediately any damaged road and pathways to the project site
(ix) Contractor to strictly comply with traffic management plan in the CEMP and to direct drivers to follow road regulations
(x) Designate personnel wearing reflector vest to manage traffic particularly from the main access road to the construction site

Generation of Waste and Improper Disposal

245. Site development works, workers and project staff will generate waste and improper disposal may cause environmental degradation. The following measures will minimize the impacts of waste generation and improper disposal:

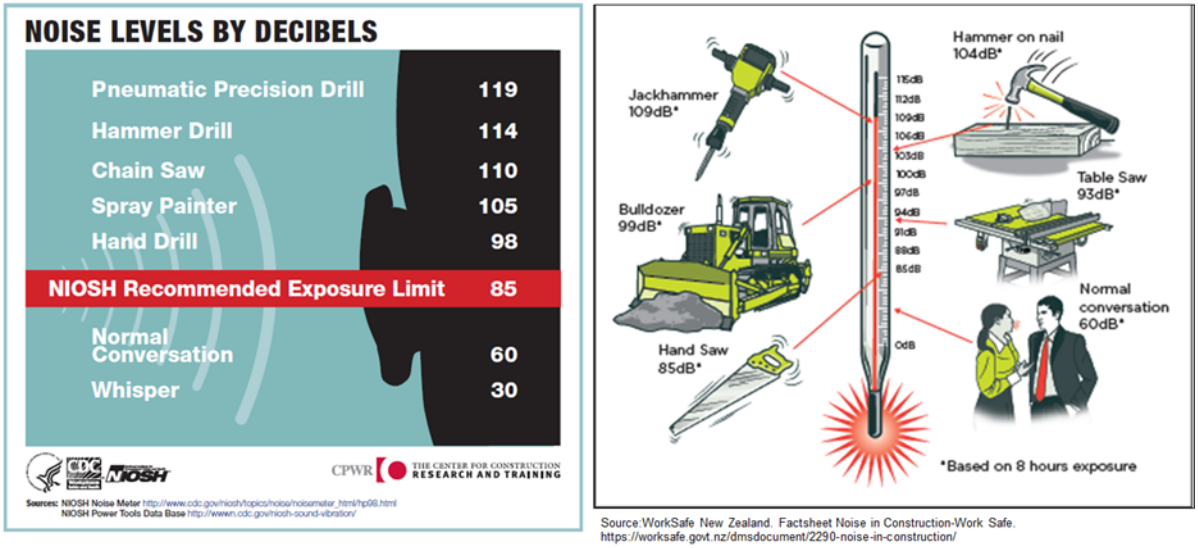
(i) Provide orientation/training to workers on proper handling of waste (segregation, collection, transport, and disposal) prior to site development works
(ii) No burning of waste will be allowed
(iii) Collected solid waste for transport will be covered with appropriate material (tarpaulin or net) to prevent spillage during transport
(iv) Dispose waste only to government-authorized disposal sites or landfill (coordinate with Mymensingh City Corporation)
(v) Mandatory use of PPEs in handling of waste generated
(vi) Reuse materials (i.e., bins, containers, boxes, etc.) whenever possible
(vii) Liquid waste such as oil drains will be disposed of properly to prevent soil contamination (oil-water separator will be provided at the construction site)
(viii) Strict compliance to the waste management plan included in the CEMP

Impacts on Air Quality, Noise, and Vibration

246. **Noise.** The use of construction vehicles and heavy equipment, transport of materials, movement of people, and construction works are sources of increased noise levels. The construction site is close to academic buildings and BAU internal access roads and together with daily university activities in Karim Bhavan, and Isha Khan Halls may also generate noise. Collectively, the noise generated may exceed the limits provided for in the Noise (Pollution) Control Rules 2006 and the WB-IFC EHS General Guidelines 2007 which is 55 dB(A) at daytime and 45 dB(A) at nighttime. Noise exposure to increased levels is an occupational as well as community health hazard. Figure 5.2 shows the typical noise levels of tools and equipment while Figure 5.3 shows the common sources of noise that individuals may be exposed to.

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Figure V.2: Typical Noise Levels of Tools and Equipment



Source:WorkSafe New Zealand. Factsheet Noise in Construction-Work Safe. https://worksafe.govt.nz/dmsdocument/2290-noise-in-construction/

Figure V.3: Common Sources of Noise and Decibel Levels

	COMMON SOUNDS	DECIBEL LEVELS dB(A)
DAMAGING	rock concert, jet takeoff, gun shot	120 to 140
	chainsaw, air gun, portable stereo, dance club, boiler room, sandblasting	100 to 120
HARMFUL	power tools, motorcycle, headphones, snowmobile, manufacturing plant, lawnmower, hydraulic press, pneumatic drill	90 to 100
IRRITATING	dishwasher, computer room, subway, busy restaurant or kitchen	75 to 90
	city traffic, hair dryer, office equipment, cell phone	70 to 80
SAFE	normal conversation	50 to 70
	countryside with rustling leaves	20 to 50

Source: Workplace Safety and Insurance Board. Ontario. Noise Hazards in the Workplace.https://www.wsib.ca/en/noise-hazards-workplace.

247. Increased noise levels at the construction site and the immediate vicinity are temporary and can be mitigated by the following measures to minimize the impact.

(i) Provide temporary enclosures (at least 2-m high) to noise-generating equipment and activities
(ii) Provide space on-site for selected construction materials to reduce trips of material delivery
(iii) Contractor will be required to maintain construction vehicles, equipment, and machineries regularly to reduce emissions, avoid smoke belching, and reduce noise

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(iv) Implement low speed to vehicles entering construction site to reduce noise
(v) Noise-generating works will be done between 7 a.m. and 10 p.m. only.
(vi) Noise-generating works in the renovation/refurbishment of academic facilities that may affect school sessions will be done at night or outside school hours
(vii) Blowing of horns or whistles will not be allowed unless needed (e.g., emergency)
(viii) Provide workers assigned in high-level noise level activities and equipment with appropriate PPEs
(ix) Workers assigned to high-level noise even with PPEs will be rotated every 2 hours
(x) Provide orientation to workers about increased noise levels and the mandatory use of PPEs
(xi) Designate someone to manage the traffic flow to minimize disruption and inconvenience to students, faculty, and staff

248. **Air quality.** Transport of materials to construction site, vehicular emissions, excavation, and earth moving works may increase dust levels. Opened land areas and aggregate materials left uncovered may also cause increased dust level. This increased dust levels may cause inconvenience to students, faculty and staff in Karim Bhavan, Isha Khan Halls together with the users of the Isha Khan Mosque. To suppress dust levels, the contractor will be required to implement the following:

(i) Install protective temporary fencing or enclosures at construction sites
(ii) Batching and aggregate mixing plant will be located outside of BAU and away from sensitive receptors (i.e., hospitals, residential area, etc.) and habitats (i.e., river, swamp, etc.)
(iii) Regularly spray water in opened land areas to minimize dispersion of dust
(iv) Maintain construction vehicles, generators (if required), and heavy equipment to avoid smoke belching
(v) No burning of garbage and other wastes within the construction site
(vi) Workers in dust-generating activities will be required to use PPEs
(vii) Transport of dust-generating materials will be covered by tarpaulin or appropriate material
(viii) Cover dust-generating construction materials on-site such as sand, excavated soil, and other dispersible material with tarpaulin (or other appropriate material) and spoils will be removed from the construction site and disposed in government-approved disposal sites.
(ix) appropriate cover material during nonworking hours, and excess soil will be removed from the worksite to the designated disposal site
(x) Provide a place on-site to accommodate the required materials so that transport and delivery of construction materials and vehicular emissions will be minimized

249. The PIC will monitor compliance to the ambient air quality standards indicated in the WB-IFC EHS General Guidelines 2007 and the Air Pollution Rules 2022 of the government. Table 2.2 lists the ambient air quality standards applicable to the project. Based on the ambient air quality sampling in November 2022, only PM_{10} and $PM_{2.5}$ limits were exceeded. It will likely be exceeded during construction phase given the associated activities. However, these can be easily mitigated by technical and engineering controls such as implementation of dust management plan, environmental monitoring, and compliance monitoring.

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250. **Vibration.** Some sources of vibration in construction that may cause whole-body exposure include driving construction vehicles, standing on surfaces that vibrate like concrete crushers, and driving heavy machinery such as bulldozer. The American Conference of Governmental Industrial Hygienists (ACGIH) set the limit of workers' 8-hour exposure to vibration as 0.87 m/s^2 for whole-body and 5 m/s^2 for hand-arm vibration. ACGIH believes that the limit of daily whole-body exposure is the maximum value with low probability of health risks.

251. To reduce exposure of workers to vibration,[71] the contractor will follow safe work practices below:

(i) Limit the time spent by workers on a vibrating surface
(ii) Avoid continuous exposure by taking rest periods
(iii) Rest the tool on the work piece whenever practical.
(iv) Maintain tools properly and do not use faulty tools since that are worn, blunt or out of alignment vibrate more
(v) Mechanically isolate the vibrating source or surface to reduce exposure.
(vi) Ensure that equipment is well maintained to avoid excessive vibration.
(vii) Install vibration damping seats and provide vibration dampeners in the form of sleeves or anti-vibration or anti-vibration gloves and boots if workers spend long hours on vibrating tools, machines, etc. at the construction site (Figure 5.4)
(viii) Provide orientation to workers assigned to tasks exposed to vibration on the proper use of tools and equipment

252. The contractor will be required to measure the levels of vibration workers are exposed to and include in the monthly report submitted. Excessive exposure to vibration can affect the nerves, blood vessels, muscles and joints of the hand, wrist and arm causing hand-arm vibration syndrome (HAVS) characterized by a permanent and painful numbness and tingling in the hands and arms as well as painful joints and muscle weakening. HAV is commonly experienced by people who use jack-hammers, chainsaws, grinders, drills, riveters, and impact wrenches.[72]

[71] Canadian Centre for Occupational Health and Safety. Vibration.
[72] Safe Work Australia. Hand-Arm Vibration. Information Sheet. https://www.safeworkaustralia.gov.au/system/files/documents/1703/handarmvibrationinformationsheet.pdf.

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Figure V.4: Anti-Vibration Seat and Gloves



Workers' Occupational Health and Safety Risks (e.g., Working at Heights, Exposure to Hand-arm Vibration and Whole-body Vibration, etc.)

253. Occupational health and safety risks include working at heights, increased noise and dust levels, exposure to chemicals, etc. To minimize the risks to occupational health and safety, the contractor is expected to implement the following measures:

(i) Provide sanitary facilities, appropriate lighting and scaffolding, and safe and adequate drinking water to workers[73]
(ii) Provide temporary place on-site for workers to do their prayers
(iii) Provide workers with appropriate and mandatory use of PPEs
(iv) Monitor compliance of workers to construction safety rules
(v) Provide first aid kits at the construction site
(vi) Install firefighting system at strategic locations within the construction site
(vii) Provide clear and visible posters or signs on general workplace safety, COVID-19 safety measures, and SEAH
(viii) Install handwashing and sanitation stations at designated place, if needed
(ix) Implement H&SP
(x) Include obligatory insurance for accidents resulting in disabilities or death for construction workers
(xi) Comply with the statutory age requirements for employment as provided for in Bangladesh Labour Rules 2015 including the provisions on occupational health and safety
(xii) Workers assigned to high-level noise even with PPEs will be rotated every 2 hours
(xiii) Provide orientation to workers about the increased noise levels
(xiv) Before start of work, conduct toolbox meetings that last for a few minutes to remind workers on the importance of compliance to the health and safety rules and procedures, and the consequences of non-compliance.
(xv) A health personnel or nurse will be stationed at the construction office to inspect labor camps and assist during minor emergency.

[73] Refer also to No.6 ILO Helpdesk. Workers' accommodation: processes and standards, Public guidance note by IFC and the EBRD, August 2009.

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(xvi) Conduct construction site inspection regularly to monitor compliance to OHS regulations (refer to Appendix 6 for sample checklist)
(xvii) Workers absent from daily toolbox meetings will not be allowed to work
(xviii) Conduct emergency mock drills
(xix) Conduct work only from 7 a.m. to 10 p.m.

Community Health and Safety Risks

254. The construction site is adjacent to academic facilities and to reduce the health and safety risks to the community, the contractor will do the following:

(i) Conduct consultation with people in the immediate vicinity of the construction site (i.e., students, faculty and staff in Karim Bhavan, Isha Khan Halls and mosques, other residents) before the start of construction to inform them about the work schedule and construction activities that may potentially affect them
(ii) Mark the areas excavated and provide clear and visible warning signs
(iii) Install appropriate enclosures in excavated areas and provide adequate lighting
(iv) Provide alternative routes and crossings to local people with clear and visible safety signs accommodating elderly, children, and people with disability
(v) Identify the boundary between the construction site and the areas accessible to BAU community and provide temporary enclosures or fences (at least 2 m high), adequate lights, clear and visible warning signs, and danger signals, and take all precautions identified in the community and safety plan of CEMP
(vi) Post visible and clear signs on COVID-19 to continue community awareness and vigilance
(vii) Designate security personnel to prevent accidents, unauthorized access, and to deter pilferage
(viii) Extended parking time of construction vehicles along side streets in the project site will not be allowed
(ix) Rehabilitate immediately any damaged road and pathways to the project site
(x) Comply with the traffic management plan in the CEMP and to direct drivers to follow road regulations
(xi) Designate personnel wearing reflector vest to manage traffic particularly from the main access road to the construction site

h. Installation of Rooftop Solar Panels

255. The installation of the solar rooftop PV systems may cause disruption to building occupants for existing buildings and safety risks to persons working at heights. Disruptions could be potential increase in dust, noise and vibration, and presence of workers and equipment at the rooftop. These impacts are minor and can be mitigated by requiring contractor to inform building occupants and nearby residents of the work schedule and nature of work. Those workers who will be working at heights will be provided with appropriate PPEs like scaffolding, safety belts, hard hats, safety googles, etc. All the scaffold systems will include guard rails on all open sides and ends. Given the safety and health risks of lifting solar panels, the use of cranes, hoists, and forklifts for unloading, lifting, and placing of panels will be undertaken to ensure safety of workers.

256. Waste that may be generated during the installation of rooftop PV systems include wet cleaning of panels and disposal of damaged or discarded solar panels which may be considered

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hazardous waste. Solar panels may include heavy metals such as silver, lead, arsenic and cadmium that – at certain levels – may be classified as hazardous waste. Contractor and/or solar panel supplier will be required to provide information about the product to determine whether it should be handled as hazardous waste or non-hazardous waste so that it can be dealt with appropriately according to relevant waste management regulations. Relevant regulations are Hazardous Waste Management Rules 2021 and Solid Waste Management Rules 2021. Glass from the panels can be recycled at general purpose glass recycle facility and metal frames can be recycled. MOE will require the manufacturer/supplier of solar PV panels to cover the disposal and/or replacement through a 'take-back' policy. If the 'take-back' policy is not available during the lifetime of the project, disposal of the waste PV panels will comply with the applicable regulations.

i. Completion of Construction Works

257. Contractor will ensure the proper clean-up of construction site after completion of construction works. Inadequate and poor clean-up and disposal of construction debris may cause safety and health risks. As well, the contractor will restore and rehabilitate all the areas damaged or impaired during construction stage. The contractor shall submit a site restoration plan, when 75% of physical works are completed. This site restoration plan shall be approved by PMU/ Supervising Consultant, implemented and completed by the contractor/subcontractors before taking over certificate is issued. To reduce risks to workers and community, PPEs will be provided, and the community will be informed of the schedule for dismantling and clean-up. Waste generated during the clean-up will be disposed of in the disposal sites approved by the Mymensingh City Corporation. Once construction is completed, all unused materials/waste will be taken away. Contractors (and their subcontractors) will clear all the construction sites. Payment will not be completed if all the construction sites are not cleared and approved by the PMU. This requirement will be included in the works' contract.

D. Post-construction Phase

258. Potential impacts during this stage are mainly beneficial as the students, faculty and staff of HCDI and IIFS as well as BICAR will now have a new and fully furnished building. Building users will enjoy the comfort and convenience of the new buildings.

1. Transfer and Use of the New Buildings

259. The operation of the new buildings may also result to improper use, lack of care by the occupants, and poor maintenance. The lack of a proper building management plan may cause premature wear and tear resulting to costly repairs for BAU operating costs. Without building management plan, waste management may be poorly addressed. Building users will generate waste and if not managed properly will cause deterioration of its aesthetic value and may pose health and safety risks.

260. To avoid these impacts, BAU will conduct yearly orientation and awareness to staff and students on proper care of the facility, designate a waste management coordinator for HCDI and IIFS as well as BICAR, and prepare a waste management plan with time-bound targets as part of the overall building management plan. An orientation/training (at least yearly) on waste

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management, proper collection, segregation (at source) and disposal will be conducted. Clear and visible posters and signs will be provided to create awareness among students and adequate and appropriate garbage bins will be provided. Promote waste management champions among the students and provide incentives.

261. The new building will require additional demand for electricity and water that will also require back-up power during power outages. Back-up generator is needed for BICAR to keep the integrity of laboratory equipment and the computer systems during power failure. To minimize demand for electricity and water and to prevent air quality and noise impacts with the use of back-up power supply, the following measures will be implemented:

(i) Incorporate estimates (demand load forecast) in the building design
(ii) Install solar rooftop PV system and rainwater harvesting
(iii) Use of energy and water-efficient lighting and water system (e.g., toilet, drinking fountain, etc.)
(iv) Periodic check/maintenance of energy (aircon, lights, etc.) and water (faucets, pumps, etc.), and immediate repair if faulty to prevent waste or resources
(v) Conduct preventive maintenance of the building
(vi) Install super silent generator set with guaranteed noise level of 40 dBA or less, comply with Air Pollution Rules 2022 (SRO. No. 255-Law/2022) and IFC-WB EHS Guidelines 2007 whichever is more stringent
(vii) Provide enclosures to the generator set

262. The project allocated an estimated cost of BDT18 lakh (or $15,385.) for a 60 kVA back-up generator.

2. Poor Operation and Maintenance of Solar Rooftop PV Systems

263. Solar rooftop PV systems are expected to reduce GHG emissions as well as contribute to the country's goal of increasing the generation of power from renewable energy sources. However, poor operation and maintenance of the solar PV systems may reduce the expected energy output and may shorten its economic life. To minimize these impacts, the following measures will be undertaken:

(i) Prepare maintenance plan and conduct scheduled preventive maintenance (i.e., quarterly or semi-annually) such as inspection of solar panels for damages or cracks, cleaning of the PV modules and inverters, checking and monitoring for corrosion and damages of hardware, electrical system and communication equipment
(ii) Maintenance plan will include details on frequency or maintenance, activities involved, responsible staff, and budget
(iii) Check the status of the solar panels and all related fixation screws, clamps, nuts and bolts after heavy typhoon with strong winds
(iv) Ensure that no shading of panels occurs over time due to vegetation growth (i.e., HCDI and IIFS) or future placement of equipment or obstructions on the roof that block the PV modules from direct sunlight (i.e., BICAR, HCDI and IIFS)
(v) No high-pressure water, brushes, or any types of solvents, abrasives, or harsh detergents will be used in cleaning the solar panels.

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(vi) To prevent bird impacts, reduce open cracks between panels where birds can build nests, use bird netting to seal areas under the panels down to the roof completely around the array, install bird spikes along the top edge of the array to prevent roosting, use plastic owl or falcon with swivel head to scare off birds, and schedule rooftop services and removal of nests based on timing of nesting season.

264. As well, solar rooftop installations will cause restrictions to access or a reduction in usable rooftop space, which may also be used for overhead water tanks and other utilities like telecommunications system, helipad, etc. To maximize the use of the rooftop space, the design and configuration of the solar PV system will consider other uses.

3. Incidence of Emergency, Natural Disaster, and Outbreak of Diseases

265. Bangladesh is known to be highly vulnerable to both disasters and climate change and ranked the seventh extreme disaster risk-prone country in the world based on the report from the Global Climate Risk Index 2021.[74] ThinkHazard identifies flooding, extreme heat, earthquake, and cyclone as among the hazard risks.[75] However, the BAU area is not considered flood-prone. To minimize the impacts of an emergency or disaster, the following measures will be considered and implemented:

(i) Prepare/finalize emergency/disaster preparedness plan and procedures
(ii) Prepare a biosafety manual and emergency procedures for BICAR based on the requirements of WHO and biosafety regulations of Bangladesh
(iii) Conduct appropriate and regular training on biosafety (about 3,535 m^2 of BICAR is designated as biosafety laboratory, BSL 2, BSL 2+ and BSL3)
(iv) Allocate an adequate budget for PPEs and other equipment needed in case on an emergency
(v) Designate a building disaster coordinator to oversee implementation of emergency/disaster preparedness plan
(vi) Conduct orientation/drills on safety and emergency awareness, and in case of another outbreak of COVID-19 or other communicable diseases
(vii) Provide regular training to relevant staff and students on biosafety emergency
(viii) Provide clear and visible emergency and safety warning signs and posters ("to do" and "not to do" in case of an event) both in English and Bangla
(ix) BICAR to prepare and finalize a biosafety manual as well as the biosecurity plan[76] prior to its operation. Appendix 8 gives the TOR for the biosafety and biosecurity consultant who will be engaged by the project to prepare the biosafety laboratory manual and the biosecurity plan for BICAR. The BAU has formed three expert committees to define user requirements of the laboratories in BICAR – (1) Committee for Climate-smart Precision Agriculture & Modeling Lab and Post-harvest Technology & Food Processing Lab, (2) Committee for Analytical Lab and Food Safety Lab, and (3) Committee for Genomics & Bioinformatics Lab and Diagnostics and Vaccines Lab. These experts will provide technical support in preparing the biosafety laboratory manual and the biosecurity plan. The

[74] Germanwatch. Global Climate Risk Index 2021.
[75] ThinkHazard. Mymensingh.
[76] WHO BioHub System – Biosafety and Biosecurity. 2022. A biosecurity plan should include the measures to be implemented to prevent the theft, misuse and intentional release of hazardous biological agents. The plan should cover personnel security, information control and physical security of the facility, including access.

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International Centre for Diarrhoeal Disease Research (ICDDR), Bangladesh and the Institute of Epidemiology Disease Control and Research can also help as they have BSL 2 and BSL 3 laboratories. ICDDR has the first BSL 3 in July 2011. Templates for a biosafety manual and biosecurity plan are given in Annex 4 and Annex 5 of the WHO Laboratory Biosafety Manual Fourth Edition and Associated Monographs, Biosafety Programme Management 2021.

4. Procurement of equipment for BICAR laboratories

266. The potential environmental implications of the equipment and goods to be procured for the seven laboratories in BICAR were evaluated. The equipment selection was made based on the academic staff research requirements in each department: imaging laboratory; climate-smart precision agriculture and modeling laboratory; analytical laboratory; post-harvest technology and food processing laboratory; food safety laboratory; genomics & bioinformatics laboratory; and diagnostics and vaccines laboratory. Except for the climate-smart precision agriculture and modeling laboratory, most of the equipment are common or similar and as part of the DPP process has been combined into separate procurement packages to ensure efficient and cost- effective procurement. The common laboratory equipment is required to conduct non-destructive analytical techniques[77] such as determining the elemental composition of materials, membrane introduction mass spectrometry, flame photometer, x-ray fluorescence spectrophotometer, etc. Except for being considered as waste once their useful life has been reached, this laboratory equipment are not expected to cause adverse environmental risks and impacts. To prevent potential occupational health and safety risks, only trained and authorized persons are allowed to use or operate this laboratory equipment.

267. Some of the research workflows require BSL 2 and occasionally BSL 3. To meet the requirements of BSL 2 and BSL 3, the laboratory equipment, computer and its accessories, laboratory furniture, and safety measures are, from an environmental perspective, incorporated within the BICAR building design.

268. This includes the flexibility to amend the workflow as required by the research being undertaken. In adopting this approach, the training of both academic and technical staff is an important consideration as only trained persons will be allowed to work in these laboratories. In addition to sharing facilities within the BICAR building, the climate-smart precision agriculture and modeling laboratory also has equipment in other buildings that will be evaluated separately.

269. The design and safety matrix of BICAR will comply with the biosafety requirements of Korea. EDCF will ensure that the terms of compliance for installation criteria and operating standards (Table 5.2) are complied.

270. **Laboratory equipment.** The selection process was the research objectives followed by the workflow and the services required to operate each item: water, gas, drainage, power, communications, etc. To aid this process, a spread sheet was prepared showing this information item by item. All the items will be imported from specialist manufacturers in developed countries

[77] Non-destructive testing (NDT) blends quality assurance and materials science to inspect and evaluate materials, components, or assemblies without destroying their serviceability. Some applications of NDT are research, manufacturing, power generation, etc. (The American Society of Non-Destructive Testing, https://www.asnt.org/MajorSiteSections/About.aspx).

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where the trend is toward smaller units using less power and consumables. New models are regularly introduced to be more efficient in the use of materials to manufacture the same and the energy use to operate them. Laboratory equipment include technical specifications and labelling that include energy efficiency and environmental sustainability (e.g., Underwriters Laboratories, and Energy Star).

271. **Laboratory furniture.** To provide the necessary flexibility in workflow as well as the BSL and hygiene levels, mobile units imported from specialist manufacturers in developed countries were selected. UGC expects that local manufactures may be able to supply some items which will reduce the environmental impacts due to shipping.

272. **Office furniture.** Items from a large local manufacturer were selected. The local supplier offers a complete service including on-site delivery, assembly and removal of packaging which reduces the environmental impact due to shipping to a minimum.

273. **Training.** Given the wide range of research and consumables involved, training and capacity building of both academic and technical staff is crucial to the efficient and sustainable operation of BICAR. Overseas and local training are included in the project. The laboratories in BICAR will be accredited internationally to ensure that the operations are synchronized with best practices. Manufacturers/suppliers of all specialized laboratory equipment such as high-performance liquid chromatograph (HPLC) and other NDT-associated equipment will be required to provide comprehensive on-site training after installation and commissioning including the environmental implications, if any.

274. The project includes two batches of training each batch covering 30 days for laboratory officers, technicians and maintenance engineers for the operation of BICAR. The training will target 100 participants. A training at NICEM in SNU, which became the model for BICAR, will be included. There will also be five batches of training (including foreign training at SNU-NICEM) and attachment of a pool of BAU teachers with the thematic laboratories under BICAR targeting 100 participants.

275. **Climate-smart precision agriculture and modeling laboratory.** During the initial equipment selection, the environmental implications were considered as follows:

(i) All the land-based items are designed to monitor and/or improve the efficiency of agriculture and are therefore unlikely to have inherent negative environmental impact.
(ii) The use of UAV/drones will have to comply with the regulations of the Civil Aviation Authority of Bangladesh on its registration, licensing, flight authorization process, etc., and BAU will ensure compliance.
(iii) Concern was raised on the request for a ship-mounted sonar partly because the regulatory and potential environmental considerations are unknown.
(iv) The self-contained facilities include both land and aquatic processes which are likely to require their own building/s. They are expected to be prefabricated self-contained systems from specialist manufacturer designed to minimize any environmental impact.

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5. Improper Use and Poor Maintenance of Biosafety Laboratories and of BICAR in General

276. BICAR will be a new research facility capable of controlling vibration, humidity, and temperature to host high value agricultural equipment. BICAR will serve as a center of research excellence in agro-food life sciences by equipped with theme-based research labs and biosafety measures. Safety measures are incorporated in the design of the biosafety laboratories' contingent to the biosafety level (i.e., BSL 1 to BSL 4). Aside from the biosafety requirements of Korea that need to be complied by BICAR, relevant biosafety regulations (Table 2.1) of Bangladesh need to be complied as well. Bangladesh submits national reports on the implementation of biosafety to the Biosafety Clearing House as part of the commitment to the Cartagena Protocol on Biosafety and the Convention on Biological Diversity where Bangladesh is a signatory.

277. Poor maintenance of the new BICAR may not serve its purposes and to minimize these potential impacts, the following measures will be undertaken:

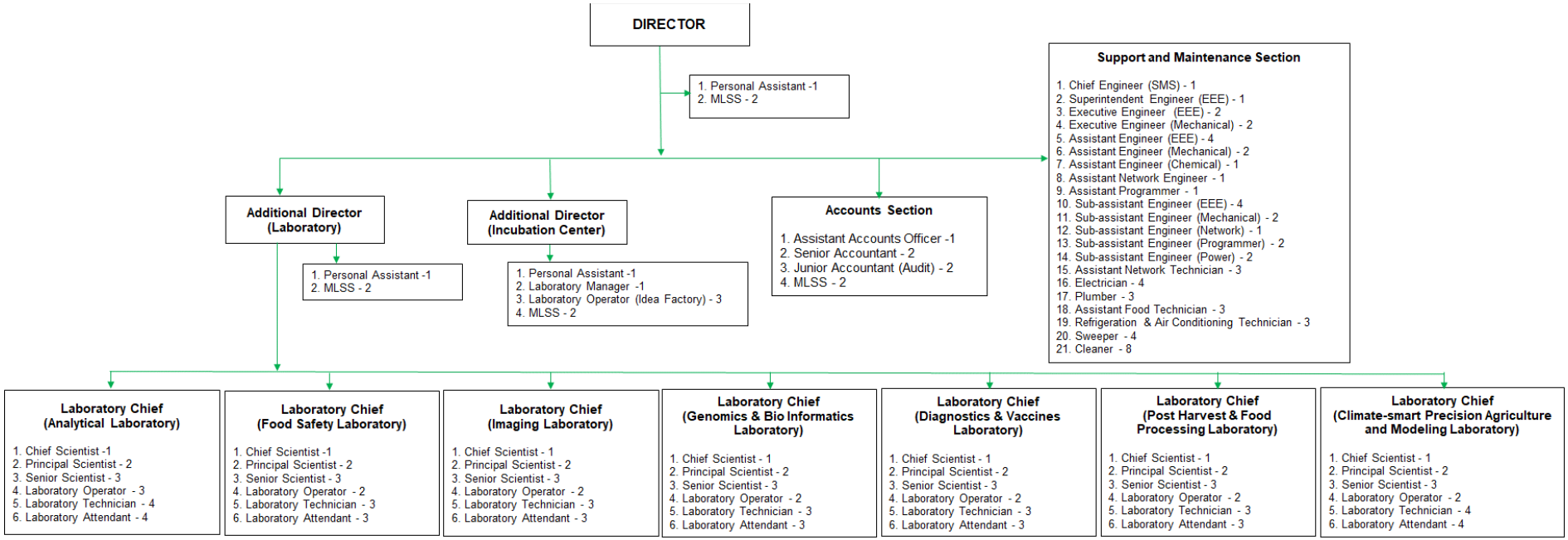
(i) Design and conduct targeted orientation and training program to equip the laboratory staff with the necessary skills, knowledge and work attitude for managing and monitoring the biosafety laboratories
(ii) Trained staff will develop the capacity of future university and laboratory staff on biosafety
(iii) Develop strategies and explore diverse sustainable funding sources to support the ongoing operations and maintenance of BICAR such as fees, public-private partnerships, grants, contract research, consulting services, technology licensing, and donations.

278. It is important to sustain the benefits from the project to continuously enhance industry responsiveness of advanced agricultural tertiary education and research for the future. Thus, a draft sustainability plan for BICAR was prepared by SHED, MOE and BAU in collaboration with EDCF and will be finalized during project implementation. The sustainability plan outlines the steps to maintain and enhance the benefits after project completion.

279. **BICAR Organizational Structure** The improper use and poor maintenance of biosafety laboratories can be avoided through a qualified and experienced technical management and staff. The sustainability of the BICAR facility depends largely on the manner the organization is operating it. Thus, it is important to ensure that there is adequate qualified human resources to deal with day-to-day operations. BAU identified a total of 189 personnel consisting of both technical and support staff. Figure 5.5 presents the organizational structure of BICAR while Table 5.3 describes the positions in the organizational structure.

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Figure 5.5 Organizational Set-up of BICAR



Source: BAU, July 2024

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Table 5.3 Distribution of Positions in BICAR

Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Director	Responsible Teacher from the University	Attached	3	1	Overall duties and responsibilities of BICAR
Additional Director (Laboratory)	Responsible Teacher from the University	Attached	3	1	Overall duties and responsibilities of the seven laboratories of BICAR
Additional Director (Incubation Center)	Responsible Teacher from the University	Attached	3	1	Overall duties and responsibilities of incubation laboratory
Laboratory Manager (Incubation Center)	Five years of similar experience. Graduation degree is a must. Age Limit: 30 Years	Direct	10	1	Working under Director/Additional Director for the overall operations of the incubation laboratory
Laboratory Operator (Idea Factory - Incubation Center)	Diploma in Electrical and Electronic Engineering. Age Limit: 30 Years	Direct	12	3	Operation and maintenance of the equipment/apparatus of the incubation center
Personal Assistant	Graduate degree Holder. Age Limit: 30 years	Direct	12	3	To perform various official duties under the direction of the Director/Additional Director
MLSS	SSC/Equivalent Degree	Direct	20	6	Provide assistance in all clerical work including distribution of letters
1. Analytical Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory
Chief Scientist	Chemistry/Applied Chemistry Chemical Engineering Equivalent Post Graduation with Ph.D. and 13 years of work experience in Analytical Chemistry. Age: Minimum 45 Years	Direct	3	1	Assist in research work along with the supervision of laboratory and instruments/apparatus.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Principal Scientist	Chemistry/Applied Chemistry Chemical Engineering Equivalent Post Graduation with Ph.D. and 10 years of work experience in Analytical Chemistry. Age: Minimum 40 Years	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Chemistry/Applied Chemistry Chemical Engineering Equivalent Post Graduation with five years of work experience in Analytical Chemistry. Age: Minimum 35 Years	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	3	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	4	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	4	Keeping records of chemicals, specimen, etc.
2. Food Safety Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Chief Scientist	Ph.D. in Food Safety/Biochemistry/Food Engineering/Nutrition with master's and 13 years of work experience in food safety laboratory. Age: Minimum 45 years.	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus
Principal Scientist	Ph.D. in Food Safety/Biochemistry/Food Engineering/Nutrition with master's and 10 years of work experience in food safety laboratory. Age: Minimum 40 years.	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus
Senior Scientist	Food Safety/Biochemistry/Food Engineering/Nutrition with master's and five years of work experience in food safety laboratory. Age: Minimum 35 years.	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	3	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	3	Keeping records of chemicals, specimen, etc.
3. Imaging Laboratory					

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory
Chief Scientist	Ph.D. with Masters in Biological Science/Equivalent subject and 13 years of work experience in imaging laboratory. Age: Minimum 45 years.	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Principal Scientist	Ph.D. with Masters in Biological Science/Equivalent subject and 10 years of work experience in imaging laboratory. Age: Minimum 40 years.	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Masters in Biological Science/Equivalent subject and five years of work experience in imaging laboratory. Age: Minimum 35 years.	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	3	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	3	Keeping records of chemicals , specimen, etc.
4. Genomics & Bio Informatics Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Chief Scientist	Ph.D. with Masters in Biological Science/Equivalent subject and 13 years of work experience in imaging laboratory. Age: Minimum 45 years.	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Principal Scientist	Ph.D. with Masters in Biological Science/Equivalent subject and 10 years of work experience in imaging laboratory. Age: Minimum 40 years.	Direct	4	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Five years work experience in Genomics and Bioinformatics laboratory with Postgraduate in Chemistry/ Chemical Engineering/equivalent subject. Age: Minimum 35 years	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	3	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	3	Keeping records of chemicals, specimen, etc.
5. Diagnostic and Vaccines Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Chief Scientist	Ph.D. in Microbiology/ Biotechnology/Pathology equivalent subject Postgraduate and 13 years of working experience in Diagnostics and Vaccine Laboratory. Age: Minimum 45 Years	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Principal Scientist	Ph.D. in Microbiology/ Biotechnology/Pathology equivalent subject Postgraduate and 13 years of working experience in Diagnostics and Vaccine Laboratory. Age: Minimum 40 Years	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Microbiology/ Biotechnology/Pathology equivalent subject Postgraduate and five years of working experience in Diagnostics and Vaccine Laboratory. Age: Minimum 35 Years	Direct	6	3	Providing research assistance
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	3	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	3	Keeping records of chemicals, specimen etc.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
6. Post-Harvest and Food Processing Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory
Chief Scientist	Ph.D. with Postgraduate in Food Engineering/ Farm Power & Machinery/ Horticulture equivalent subject and 13 years of work experience in Post Harvest & Food Processing Laboratory. Age: Minimum 45 Years	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Principal Scientist	Ph.D. with Postgraduate in Food Engineering/ Farm Power & Machinery/ Horticulture equivalent subject and 10 years of work experience in Post Harvest & Food Processing Laboratory. Age: Minimum 40 Years	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Postgraduate in Food Engineering/ Farm Power & Machinery/ Horticulture equivalent subject and five years of work experience in Post Harvest & Food Processing Laboratory. Age: Minimum 35 Years	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	4	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	4	Keeping records of chemicals, specimen etc.
7. Precision Agriculture Laboratory					
Laboratory Chief	Responsible Teacher from the University	Attached	3	1	Managing the overall activities of the laboratory
Chief Scientist	Ph.D. with master's degree in electrical & Electronics/ Electronic Instrumentation/ Equivalent and 13 years of work experience in Precision Agriculture Laboratory. Age Minimum 45 Years.	Direct	3	1	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Principal Scientist	Ph.D. with master's degree in electrical & Electronics/ Electronic Instrumentation/ Equivalent and 10 years of work experience in Precision Agriculture Laboratory. Age Minimum 40 Years.	Direct	5	2	Assisting in research work along with the supervision of laboratory and instruments/apparatus.
Senior Scientist	Master's degree in chemistry/chemical engineering/Equivalent subject and five years of work experience in Precision Agriculture Laboratory. Age Minimum 35 Years.	Direct	6	3	Assisting in research work along with the supervision of laboratory and instruments/apparatus.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Laboratory Operator	Must be a graduate in Science. Age: Maximum 30 Years	Direct	12	2	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Technician	HSC (Science) pass with two years experience in general assistance to higher students in research work including storage of laboratory equipment, chemicals, species etc. or Bachelor of Science degree. Age: Maximum 30 Years	Direct	13	4	Assisting in research work including storage of laboratory equipment, chemicals specimen, etc.
Laboratory Attendant	SSC Passed. Age: Maximum 30 Years	Direct	20	4	Keeping records of chemicals, specimen etc.
8. Support and Maintenance Section					
Chief Engineer	Master's degree in electrical & Electronics Engineering/Mechatronics. 15 Years of relevant experience. Minimum age limit: 45 Years	Direct	3	1	Supervision and coordination of all the duties and responsibilities of the laboratory
Superintendent Engineer (EEE)	Master's degree in electrical & Electronics Engineering/Mechatronics. 12 Years of relevant experience. Minimum age limit: 40 Years	Direct	4	1	Supervision and coordination of all the duties and responsibilities of the laboratory
Executive Engineer (EEE)	Master's degree in electrical & Electronics Engineering/Applied Physics. Eight years of relevant experience. Minimum age limit: 35 Years	Direct	6	2	Supervision and coordination of all the duties and responsibilities of the laboratory
Executive Engineer (Mechanical)	Master's degree in mechanical engineering/Mechatronics. Eight years of relevant experience. Minimum age limit: 35 Years	Direct	6	2	Supervision and coordination of all the duties and responsibilities of the laboratory

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Assistant Engineer (EEE)	Graduation in Electrical & Electronics Engineering/Applied Physics. Maximum age limit: 30 Years	Direct	9	4	Support services related to laboratory duties and responsibilities.
Assistant Engineer (Mechanical)	Graduation in Mechanical Engineering/Mechatronics. Maximum age limit: 30 Years	Direct	9	2	Support services related to laboratory duties and responsibilities.
Assistant Engineer (Chemical)	Graduation in Chemical Engineering/Applied Chemistry. Maximum age limit: 30 Years	Direct	9	1	Support services related to laboratory duties and responsibilities.
Assistant Network Engineer	Graduation in Computer Science and Engineering. Maximum age limit: 30 Years	Direct	9	1	Support services related to laboratory duties and responsibilities.
Assistant Programmer	Graduation in Computer Science and Engineering. Maximum age limit: 30 Years	Direct	9	1	Support services related to laboratory duties and responsibilities.
Sub Assistant Engineer (EEE)	Diploma in EEE. Maximum Age limit: 30 years	Direct	10	4	Support services related to laboratory duties and responsibilities.
Sub Assistant Engineer (Mechanical)	Diploma in Mechanical Engineering. Maximum Age limit: 30 years	Direct	10	2	Support services related to laboratory duties and responsibilities.
Sub Assistant Engineer (Network)	Diploma in Mechanical Engineering. Maximum Age limit: 30 years	Direct	10	1	Support services related to laboratory duties and responsibilities.
Sub Assistant Engineer (Programmer)	Diploma in Mechanical Engineering. Maximum Age limit: 30 years	Direct	10	2	Support services related to laboratory duties and responsibilities.
Sub Assistant Engineer (Electrical)	Diploma in Electromechanical Maximum Age limit: 30 years	Direct	10	2	Support services related to laboratory duties and responsibilities.
Electrician	HSC (Vocational) and Electric Maintenance related course completed. Maximum Age limit: 30 years	Direct	16	4	Support services related to laboratory duties and responsibilities.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
Refrigerator & Air Conditioning Technician	HSC (Vocational) pass and Refrigeration & Air Conditioning course completed. Maximum Age Limit: 30 years	Direct	16	3	Support services related to laboratory duties and responsibilities.
Asst. Network Technician	SSC pass with six months Trade Course/Vocational Course completed in related subject. Maximum Age Limit: 30 years	Direct	17	3	Support services related to laboratory duties and responsibilities.
Plumber	SSC (vocational)pass and course completed related in plumbing and pipe fittings. Maximum Age Limit: 30 years	Direct	17	3	Support services related to laboratory duties and responsibilities.
Asst. Food Technician	SSC (Vocational) pass and course completed related in Food Processing and Preserving. Maximum Age Limit: 30 years	Direct	17	3	Support services related to laboratory duties and responsibilities.
Cleaner	SSC pass. Maximum Age Limit: 30 years	Direct	20	8	Keeping the office room, toilet, and floor clean as per the instructions of the authority.
Sweeper	Must have passed 8th standard, educational qualification can be relaxed in case of caste weeper. Maximum Age Limit: 30 years	Direct	20	4	Keeping the office room, toilet, and floor clean as per the instructions of the authority.
9. Accounts Section					
Asst. Accounts Officer	Postgraduate in Accounting/Finance (Major) Maximum Age Limit: 30 years	Direct	9	1	Keeping accounts of financial income, expenditure and transactions.
Senior Accountant	Must be a Graduate in Accounting with 2nd division/class at all levels. Maximum Age Limit:30 years	Direct	12	2	Keeping accounts of financial income, expenditure and transactions.
Junior Accountant (Audit)	Must be a Graduate in Accounting with 2nd	Direct	13	2	Keeping accounts of financial income, expenditure and transactions.

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Proposed Name of the Position	Qualification and Experience	Type of Recruitment (Attached/Direct/Outsourcing)	Pay Grade	Number of Positions	Duties/Accountability
	division/class at all levels. Maximum Age Limit:30 years				
MLSS	SSC/Equivalent Maximum Age Limit:30 years	Direct	20	2	Provide assistance in all clerical work including distribution of letters.

Source: BAU, July 2024.

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6. Generation of Waste from the Biosafety Laboratories in BICAR

280. BICAR will have three biosafety laboratories – two BSL 2 and one BSL 3. The BSL 2 are food safety laboratory, and the genomics and bioinformatics while the BSL 2/BSL 3 is the diagnostics and vaccines laboratory as well as the animal experimentation facility. The laboratories in BICAR will generate waste that will require treatment prior to disposal.

281. As required by the Bangladesh Biosafety Guideline 2020, the required procedure and containment equipment and laboratory facilities are given in Appendix 7. BICAR will use autoclaving (steam sterilization) as the main decontamination method. An efficient and properly operating autoclave will render biohazardous waste sterile so that it can be disposed of safely through the municipal waste. The three expert committees formed by BAU in identifying the user requirement for BICAR will prepare and finalize the BICAR biosafety manual outlining the procedures for autoclaving biohazardous waste, handling of sharps, solid infectious waste, waste labeling, training required, safety and emergency procedures, monitoring and performance indicators, record keeping and reporting, waste disposal and handling of non-infectious and general waste. Aside from the technical guidance provided by the WHO Laboratory Biosafety Manual Fourth Edition and Associated Monographs Laboratory Biosafety Manual Fourth Edition 2020, the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials First Edition September 2019 will provide additional guidance on the appropriate approach contingent to the requirements of BICAR. These guidelines prepared by the Bangladesh Biosafety and Biosecurity Society (BBBS) is a single reference document for developing safe facilities, managing biosafety and biosecurity program, and safely disposing biological waste. According to the BBBS, they looked for the best available guidelines like CDC/NIH, WHO guidelines, Canadian Biosafety Guidelines, Singapore Biosafety Guidelines for GMO, Arthropod Containment Guidelines of American Society of Tropical Medicine and Hygiene, NIH recombinant DNA guidelines, and collected and adapted content of this guidelines following those standard documents.

282. The biosafety manual to be prepared by the BAU will cover both the post-construction phase and the decommissioning phase of BICAR.

7. Opportunity for Sustained Agricultural Research Laboratory Like BICAR

283. Given the importance of BICAR in tertiary agricultural education and in serving as a centre of research excellence, it is crucial to ensure its sustainability. The following measures will be considered to advance the sustainability of BICAR:

(i) Prepare sustainability cookbook - a comprehensive guide for implementing sustainability initiatives within BICAR outlining specific strategies, best practices, and actionable steps fit to the unique needs and objectives of BICAR
(ii) Set key performance indicators (KPIs) to track performance of BICAR, identify areas for improvement, and to maintain accountability in achieving sustainability goals
(iii) Establish environmental stewardship in the organizational culture of BICAR, HCDI and IIFS to guide decision-making processes and operational practices to promote resource use efficiency, reducing waste generation, and minimizing carbon emissions throughout the activities of the research laboratories

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(iv) Implement sustainable farming practices within the research facility
(v) Incorporate environmental impact assessments into research projects
(vi) Promote biodiversity conservation and ecosystem resilience through research initiatives

8. Emergency Response and Disaster Management Plan

284. An emergency is defined as a condition of serious nature which develops unexpectedly and endangers downstream property and human life and requires immediate attention. BAU will develop an emergency response and disaster management plan (ERDMP) which will consist of emergency response plan (ERP) and disaster management plan (DMP). A draft contingency plan for emergency disaster management is given in Appendix 9.

285. To prepare in the event of an emergency or disaster, firefighting systems will be strategically located in the new building. The draft ERP will be finalized in consultation with students, faculty, and administrative staff. The security team will be the Engineering Division of BAU, and the Chief Engineer will oversee the emergency response team. The outline of the ERP is given in Table 5.4.

286. The ERP will include all potential indicators such as smoke or incident of fire, earthquake, cyclone etc. The ERP also presents warning and notification procedures to follow during the incident or potential disaster. The objective is to provide timely warning to building occupants and nearby residents and alert key personnel responsible for acting in case of emergency.

Table V.4: Key Aspects Considered in the Draft ERP

Objectives	This emergency response plan will guide the students, faculty, and staff of BAU during an accident or emergency to prevent or minimize injury, damage, and material loss; and, to prevent or mitigate environmental impacts from the accident or emergency.
Types of emergencies	• Earthquakes • Cyclones • Energy or utility outages • Fire hazards • Hazardous materials releases • Terrorism
Planning	• Identify hazards and assess risk • Assess capabilities and resources • Develop an emergency plan and procedures • Conduct training • Public relations • Conduct drills and exercises • Develop audit procedures
Emergency preparedness requirements	• Evacuation may be required if there is a fire in the building or other hazard. The evacuation team will direct the evacuation of the building and account for all employees outside at a safe location • Identify assembly points and/or evacuation points • Prepare well-defined escape routes • Install firefighting systems in strategic locations

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	• Ensure that proper security arrangements are functioning at all times • Ensure efficient transport and communications system • Prohibit smoking within areas with flammable substances (if any) • Ensure water availability for firefighting • Ensure availability of sufficient number of trained staff to deal with any emergency • Supply clear and audible emergency alarms or whistles and siren system to provide an emergency population warning to the local general population of approaching danger. • Conduct drills to familiarize students, faculty, and administrative staff on evacuation routes and use of the firefighting system • Provide emergency contact number of the medical center (and nearest hospital), ambulance, and fire service and police stations • Switch off main electrical equipment when not in use
Evacuation Team	Evacuation Team Leader will lead the team, Floor Wardens (one for each floor), Searchers (one per floor), Stairwell and Elevator Monitors Aides for People with Disability, Assembly Area Monitors (account for evacuees at the assembly area and inform incident commander if anyone is missing or injured)

287. The DMP will consist of preventive measures including (i) formulation and strict implementation of safety codes and measures; (ii) periodic inspection of firefighting equipment and its planned maintenance; (iii) create awareness among the students about electric shock; (iv) declaring BAU as "no smoking zone"; and (v) mock drills by the firefighting team, disaster management trainings among students, faculty, and staff.

288. Aside from the ERP, a business continuity plan (BCP)[78] will be developed by BAU to provide continued operations, services, and activities across campus in case of a potential emergency or disruptions from the usual conduct of business. For planning purposes, long-term is defined as ranging from two days to several weeks and will address similar types of emergencies identified in the emergency response and disaster preparedness plan. The BCP will be implemented as soon as BAU has ensured the safety of those who live, work, study, visit the campus, and the university property. Main objectives of the BCP are: (i) protect life and safety, (ii) secure critical infrastructure and facilities of the university, and (iii) facilitate the resumption of the teaching and research programs of the university.

Peace and Order/Security

289. The peace and order focused areas are crime and disorder (violations of the law and situations that disrupt harmonious living within a community). These include violations related to illegal drugs as a mandatory sub-focus area. Peace and order include activities that directly address criminality, armed conflict, and human rights violations and bring about the achievement of justice, peace, and order.

[78] It is a plan that describes how an organization will continue to function during or after some kind of emergency, disaster, or event. It involves planning how your key services or products can be continued, and the recovery of key business and systems (Canadian Centre for Occupational Health and Safety).

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290. The proposed project area is located within BAU campus and is a well secured place having full-time security personnel posted at different points of the areas to look after security and peace of the areas. The security personnel of BAU are under the command of the Chief of the security officer. In addition to that, the contractor shall have their own security forces headed by a security officer and they will be liable under a working group for management of peace and order. The contractor's security personnel will look after and maintain peace and order within project area during project implementation period.

291. The contractor's security officer will conduct regular toolbox meetings to guide security personnel under his command. The contractor's security personnel will have close communication with the BAU security team and in case of any necessary for management of conflict, crime and disorder, will seek immediate support from the BAU security forces. In addition, in case of any emergency, local police forces will be deployed through the support of the contractor's working group and BAU Chief of Security forces.

E. Decommissioning Phase

292. Decommissioning is the process of safe deconstruction of a facility or building which is no longer needed or not safe anymore to occupy. This may involve activities to dismantle the building partly or totally. Activities during decommissioning may pose health and safety risks to students, faculty, and staff of BAU and other building users. Also, the lack of clarity on the scope of decommissioning may pose safety risks and uncertainty to BAU community. To organize the activities and to minimize potential environmental impacts, the following measures will be undertaken:

(i) Prepare a decommissioning plan to determine the extent of work, steps to be taken, resources required (i.e., budget, workers and staff, equipment, etc.), items to be recycled/reused, handling of hazardous substances, cost-efficiency measures, permits required, etc.
(ii) Repair areas to address safety concern
(iii) Implement occupational health and safety measures – disconnect utilities connected to the buildings, identify areas with hazardous materials, etc.
(iv) Dispose waste generated from the dismantling activities to the government-approved disposal site by coordinating with the Mymensingh City Corporation

F. Effects of Climate Change

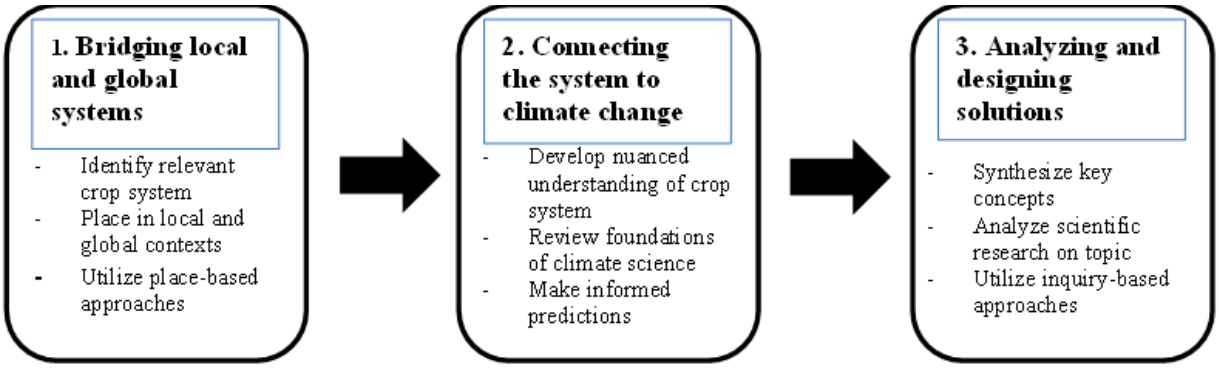
293. According to the assessment by UNICEF, 20 districts out of the 64 districts in Bangladesh are exposed to the highest risk from climate-related disasters such as tropical cyclones, storm surge, sea level rise, floods, bank erosion, drought, and heatwaves.[79] Mymensingh is not one of the 20 districts considered as exposed to highest risk of climate change.

294. However, impacts of climate change can be experienced throughout the project cycle; thus, it is critical to be prepared to ensure the sustainability of the project. The overall approach proposed by the project to climate action in agriculture and food security in Bangladesh is shown in Figure 5.5.

[79] UNICEF. A Gathering Storm Climate Change Clouds the Future of Children in Bangladesh. April 2019.

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Figure V.5: Overall Project Approach to Climate Action



Source: SATEP Climate Risk and Adaptation Assessment, March 2024

295. Based on the climate change assessment for the project, the following adaptation and mitigation measures are considered:

Adaptation

(i) All building infrastructures will follow green building principles and standards for climate and disaster resilience. The HCDI and IIFS building will be designed to withstand over the basic windspeed of 67.4 m/s in Mymensingh.
(ii) Inclusion of protocols for emergency preparedness and response, biosafety measures, and safety drills.
(iii) Tree plantation and beautification of campus (arboriculture and landscaping works) to target the climate risk of extreme heat and water scarcity.
(iv) Refurbishment and renovation of 17 existing buildings will use solar reflective index paint to address extreme heat.
(v) Under Output 4. Conduct seminars and workshops for occupational health and safety standards, climate risks, earthquake evacuation and fire drills, and information security based on the BAU disaster management plan and business continuity plan. This is expected to improve adaptive capacity of students, faculty and staff through knowledge, skills, and awareness to be disaster-prepared and climate change resilient.
(vi) Detailed design will incorporate the results of the technical assessments and will integrate climate-resilient features for the specialty laboratories and, include provision for improved natural lighting and ventilation, inclusion of efficient water and power system, e.g., renewable energy sources, thermal insulation, among others.
(vii) Installation of rainwater harvesting.
(viii) Maintain temperature within the range required for safe and effective storage and use of chemicals and machines in the laboratories.

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Mitigation

(i) Installation of solar rooftop PV systems in the new building for HCDI and IIFS, the 17 existing buildings for renovation consistent to the solar rooftop directives of the government and will contribute to the goal of Renewable Energy Policy 2008 on renewable energy generation and utilization.

(ii) Inclusion of grant schemes for competitive and collaborative agriculture and life science research (R&D) and supporting agricultural startup. Grants will develop innovative solutions for climate-smart agricultural research in agriculture and food system value chain.

(iii) Under Output 1. Adoption of new agricultural technology - incorporate in course content, 'agricultural digitalization' into the curricula (e.g. AI, big data, robotics, unmanned aviation systems, sensors, communication networks, IoT into the farm production system; GIS, GPS, RS applications in agriculture). Activities include the adoption and use of digital technologies (e.g., big data, RS GIS, sensors, IoT, etc.) in climate modelling for sustainable farming systems and precision agriculture while the curricula will be updated to integrate new topics to develop new skills and knowledge needed by students and researchers for engaging in climate-smart agricultural jobs and to be more competitive in green opportunities. The activities are also expected to contribute to adaptation by strengthening the capacity of farming communities in adapting to projected climate variabilities and anomalies based on the results of the analytical work and climate modeling.

(iv) Construction of septic tank and soak well for 200 users and implementation of waste management and resource conservation plans to reduce carbon footprint.

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VI. ANALYSIS OF ALTERNATIVES

296. BAU covers a total area of about 486 hectares (or 4.86 km^2) and the location of the new buildings are within the premises of BAU as no land acquisition is the main consideration in selecting the sites of the new buildings for BAU HCDI and IIFS as well as BICAR.

A. Location of New Buildings

297. Of the new buildings under SATEP, only the location of BICAR considered three alternative sites. Location Option 1 and Location Option 2 are along a busy road while Location Option 3 is near a fishery pond and less busy road. Figure 6.1, Figure 6.2, and Figure 6.3 show the locations of the three site options while Figure 6.4 shows the three sites. Table 6.1 shows the summary evaluation of the site options.

Figure VI.1: Location Option 1 (along a busy road), BICAR



Figure VI.2: Location Option 2 (along a busy road), BICAR



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Figure VI.3: Location Option 3 (near a fishery pond and along less busy road), BICAR



Figure VI.4: Location of the 3 site options for BICAR

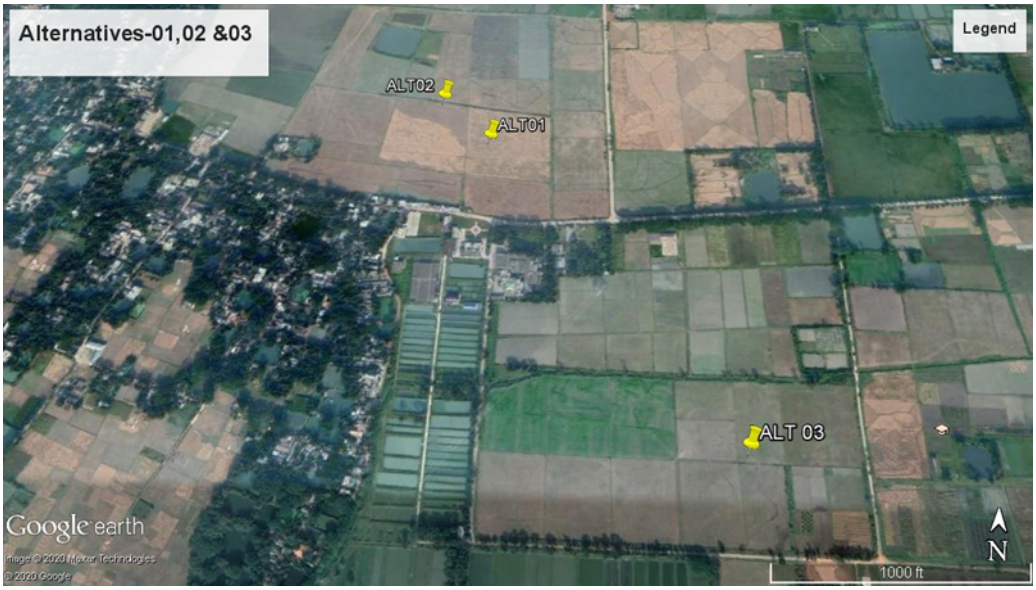


Table VI.1: Summary Evaluation of Site Options for BICAR

Selection Criteria	Location Option 1	Location Option 2	Location Option 3
Land type	Urban agricultural land	Urban agricultural land	Urban agricultural land
Road connectivity	Connected with one busy road plying from East and West	Connected with one busy road plying from East and West	Connected with two roads: one quiet road plying from North to South. The other quiet road running from East to West
Existing environmental condition	No sensitive floral or faunal distribution within 300 m of the project site. Few trees,	No sensitive floral or faunal distribution within 300 m of the project site. Few trees,	No sensitive floral or faunal distribution within 300 m of the project site. Few trees,

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Selection Criteria	Location Option 1	Location Option 2	Location Option 3
	herbs/grasses noted along the roadside [Aam (*Mangifera indica*), Akashmoni (*Acacia auriculiformis*), Jaam (*Syzygium cumini*), Koroi (*Albizia procera*), etc.]	herbs/grasses noted along the roadside [Aam (*Mangifera indica*), Akashmoni (*Acacia auriculiformis*), Jaam (*Syzygium cumini*), Koroi (*Albizia procera*), etc.]	herbs/grasses noted along the roadside [Akashmoni (*Acacia auriculiformis*), Jaam (*Syzygium cumini*), Koroi (*Albizia procera*), etc.]
Distance from the major proposed faculties	About 500 m	About 500 m	About 300 m
Given the above, Location Option 3 was selected as road connectivity is better and its proximity to major faculties.			

298. Aside from the three site options, the "no project" option or business-as-usual and "with project option were also considered. A "no project" option will result to the available locations within the BAU campus not having the best and highest usage of land. As well, the students, faculty, and staff in BAU will not have the opportunity to experience improvements in the classroom, library, auditorium and sports facilities through renovation that will be supported by the project, and the benefits of having new buildings.

299. The "no project" option will also result to loss of potential gain that will be provided by other project interventions such as industry collaboration and technology transfer, competitive research and development (R&D) grants, networking with leading research universities, overseas training, incubation, and agricultural startup. Overall, the "with project" option" is expected to strengthen agricultural R&D including collaboration with other universities and research center, improve the quality of climate-smart tertiary agricultural education, save government revenue for analyses in foreign laboratories, reduce dependency to foreign laboratories for reliable results, short turn-around period for laboratory results, and increase the available of trained technical professionals, and reduce the cost of capacity building for regular training in foreign laboratories. Table 6.2 presents a comparison of "no project" option and "with project" option.

Table VI.2: Comparison of "With Project" and "No Project" Options

Description	"With Project" Option	"No Project" Option
Employment opportunities	• Temporary jobs for skilled and nonskilled workers will be created during the construction works for the new HCDI and IIFS as well as BICAR and the renovation of the classroom, library, auditorium and sports facilities. • Establishment of the Institute of Climate Change and Environment, and the Institute of Biotechnology is expected to generate employment and additional expertise as faculty members.	Limited or no jobs will be created

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Description	"With Project" Option	"No Project" Option
Temporary disruption to daily activities and inconvenience mostly during construction phase	There will be temporary disruption of short duration in the construction sites. This temporary disruption is also applicable in the area within the vicinity of the auditorium and sports facilities.	There may be potential for traffic congestion also due to increased population and vehicle owners within the BAU campus resulting to inconvenience.
Services and/or use of classroom, library, auditorium and sports facilities	During renovation works, services and use of the classroom, library, auditorium and sports facilities may be disrupted or totally not available.	Services and/or use will be available
Producing graduates prepared to meet the requirements of the agricultural sector in ensuring food security, climate change and disaster resiliency, and private sector collaboration.	Improvement in tertiary agricultural education through advanced agricultural R&D, state-of-the-art equipment and facilities, training, and networking, revising curricula to make it industry responsive and climate-smart.	Limited or no possibility
Site preparation and land clearing	Will involve excavation, movement of heavy equipment and vehicles, presence of workers, transport of materials and generation of waste	None
Ecological impacts	Site for the construction has some shrubs planted by BAU that will be cleared. There will be landscaping post-construction.	No impacts
Opportunities for students to have more options for R&D and training	There will be more options for R&D and training; links to the private sector are expected to improve chances of employability	No opportunities
Contribution to Vision 2041, Bangladesh Delta Plan 2100, and Mujib Climate Prosperity Plan Decade 2030	Project interventions such as establishment of the BICAR are consistent to the goals of the strategic and development plans of Bangladesh.	No contribution
Establishment of BICAR to include the BAU innovation, incubation, and startup center.	Will develop BAU as center of excellence on agricultural tertiary education, build a modern technology-responsive agricultural tertiary education system, and create facilities for innovative R&D.	None

B. Design of New Buildings

300. The government aims to achieve 15% of electricity from renewables by 2030, 40% by 2041, and 100 percent by 2050.[80] Solar PV installation capacity is proposed to account for between 70% and 80% of the total renewable energy capacity to be installed. To contribute to

[80] United Nations Development Programme. Bangladesh's energy transition journey so far (accessed 17 February 2024).

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this goal, the new buildings under SATEP will be designed to incorporate energy efficiency and sustainability provided for in Part III, Chapter 4 of the Bangladesh National Building Code (BNBC) 2020.[81] Chapter 4 of the BNBC 2020 provides guidelines on green building, use of building concepts having a positive environmental impact and encourage sustainable construction practices.

301. Solar rooftop PV systems will be installed in the new buildings as well as incorporating green building features and energy-efficient equipment and materials.

[81] BNBC 2020 was published on 11 February 2021.

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VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Introduction

302. Consultation provides opportunities for stakeholders affected by the project to share their views and concerns about the proposed project and for the proponent to disclose relevant information about the project. Consultation will continue not only during the preparation of the IEE but also during project implementation. Consultation aims to achieve the following:

(i) Participation of affected stakeholders by providing their inputs on the planned development;
(ii) To inform affected stakeholders about the project, the potential environmental implications of project activities and the mitigation measures, and project benefits (direct and indirect);
(iii) Determine the perceptions and concerns of the affected stakeholders on the project and discuss possible solutions;
(iv) Describe the mechanism for handling potential grievance or complaints to the project and its implementation; and,
(v) To inform about their access to relevant project information and the proponent's responsibility for public information disclosure.

B. Requirements for Consultation

303. **National requirements**. Public consultation, participation and information disclosure are not mandatory based on ECA 1995 and ECR 1997. However, Section 8 (2) of ECA 1995 provides that the Director General, DOE may hold a public hearing for an ECC application. In the ECR 2023, there are general provisions for stakeholder consultations such as requiring the project proponent to organize public hearings and to provide opportunities for stakeholders to submit written comments. While public consultation is a key change from the ECR 1997, this requirement is only for red category projects (i.e., severe potential environmental and social impacts requiring significant mitigation measures to reduce impacts). Consultations required in ECR 2023 can be local, regional, or national depending on the geographical extent of the project.

304. Information disclosure requirements in ECR 2023 for red category provide that the project proponent is responsible for the preparation of the draft EIA and the summary EIA in Bangla made available to the public through their website and the concerned DOE office and their website. Aside from this, a notice on the date and time of the public hearing needs to be published in a widely circulated local and national newspaper. The same information must be posted on the websites of the project proponent and the DoE. The public can provide their comments on the draft EIA online within 30 days of its publication. Also, the minutes of the public hearing must be approved by the concerned DOE office and attached to the EIA report to be submitted by the project proponent to the DOE in their ECC application. Based on the results of public consultations, the project proponent needs to revise/update the EIA and the EMP. The EIA approved by the DOE must the posted in the DOE website. The ECR 2023 does not indicate that the IEE for orange category project be publicly disclosed.

305. The EIA Guidelines for Industries February 2021 published by the DOE provides guidance on scoping consultation, stakeholder consultation process, public consultation, and participation

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(identification of stakeholders and methods of public consultation), and stakeholder consultation reporting template.

306. **SPS 2009**. Consultation and participation based on SPS 2009 requires the following:

> "The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that:
>
> (i) Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;
> (ii) Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people;
> (iii) Is undertaken in an atmosphere free of intimidation or coercion;
> (iv) Is gender-inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and
> (v) Enables the incorporation of all relevant views of affected people and other stakeholders into decision-making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

307. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report (Section 4, paragraph 19 of Appendix 1, p33)."

308. **EDCF Safeguard Policy 2020.** The participation of stakeholders in establishing a constructive relationship with affected persons is recognized by KEXIM as essential for the successful management of project environmental and social impacts. The level of participation required in the consultation is proportionate to the concerns raised by the affected communities and the potential impacts of the project. If needed, separate meetings can be done to get the views of men and women and then also reflect their different interests and priorities. If indigenous peoples are involved, the borrower is responsible to work on special mechanism for them to participate and express their views. The results of the consultations will be included in the ESIA or IESE. It is necessary to start the consultations at the project preparation stage and will continue throughout the project cycle. Consultations need to be conducted in an atmosphere that is free of intimidation or coercion, provide information appropriate and understandable to affected people, gender-inclusive and considers the needs of disadvantaged and vulnerable groups. Views of affected people and stakeholders from the consultations will be incorporated during the design, preparation of mitigation measures as well as in the allocation of development benefits and opportunities.

C. Methodology

(i) **Identification of stakeholders.** Stakeholders are identified based on the potential impacts of the project on them. Primary stakeholders - if they will be directly affected during construction and post-construction, namely, the BAU community - students, faculty members, administrative staff, and support services staff. Secondary stakeholders - persons, organizations, or businesses that may be indirectly affected by project activities but may have interests on the project, such

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as relevant government agencies, nongovernment organizations, transport cooperatives, and the public.

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

(iii) **Record of the meeting.** Views of the participants in the consultation were summarized together with the responses of the BAU project team. General information of the participants such as name, gender, occupation, and signature were collected and shown in the attendance list.

D. Results of Consultation

309. Due to the restrictions from the COVID-19 pandemic in March 2020, hybrid consultations were done through virtual meeting, online survey, and a face-to-face meeting when most of the restrictions were lifted in 2022.

1. Virtual Meeting through Zoom on 13 July 2020

234. **Stakeholder mapping and invitation.** A list of the stakeholders was prepared (including local government units) and an email was sent by the BAU project team to the prospective participants informing them of the virtual consultation to be conducted via Zoom. A project brief highlighting proposed interventions, and potential environmental impacts and mitigation measures was attached to the invitation. An announcement of the virtual meeting was also posted in the BAU project web page together with the project brief. Twenty participants joined the virtual meeting. Table 7.1 presents the attendance while Table 7.2 gives the summary of discussions.

235. **Procedures.** Prior to the start of the virtual meeting, the BAU project team explained the procedures – (i) meeting will be recorded, (ii) participant can opt to be on video or not, (iii) participants were requested to mute their audio; (iv) during the questions & answer (Q&A) session, a participant can raise their hand (through the icons provided in Zoom) and unmute their audio; (v) BAU team facilitated the Q&A. Photos of the virtual meeting are given in Figure 7.1.

236. **Program.** The program included – welcome address/opening remarks, introduction of participants, brief project presentation, ADB project team, ADB safeguard requirements, Q&A, closing remarks.

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Table VII.1: Participants in Virtual Meeting, 13 July 2020

No	Name	Institute	Email	Mobile Number
1.	Prof. Dr. Mohammad Ashiqul Islam	OC, BAU Dairy Farm, BAU	m.a.islam@bau.edu.bd	01712428472
2.	Dr. Bapon Dey	OC, Poultry Farm, BAU	dey_bau@yahoo.com	01716595056
3.	Prof. Dr. Md. Munir Hossain	OC, Artificial Insemination Centre, BAU	mmhabg@gmail.com	01716540609
4.	Prof. Muckta Khan	OC, Goat and Sheep Farm, BAU	mucktakhan@yahoo.co.uk	01731207911
5.	Mr. Md. Mostak Sarker	Poultry Farm Mosjid representative, BAU outside	rakibadtbau@gmail.com	01714419273
6.	Mr. Md. Faruque Hossain	Commissioner 21 No. Word, Mymensingh City Corporation	rashedrajon28@gmail.com	01717425231
7.	Prof. Md. Mozammel Huq	Hall super, GTI	mmh.gti@bau.edu.bd	01716798023
8.	Dr. Enamul Hoq	CSO, Planning, Bangladesh Fisheries Research Institute, Mymensingh	hoq_me@yahoo.com	01715132569
9.	Dr. Shamsun Nahar Begum	PSO, Plant Breeding Division, Bangladesh Institute of Nuclear Agriculture, Mymensingh	sbluna98@yahoo.com	01716280721
10.	Md. Shamsul Islam	Deputy Director, Accounts Section, BAU, Mymensingh	khukonbau@gmail.com	01712886176
11.	Prof. Dr. Abu Hadi Noor Ali Khan	Chairman, Bazar Committee, BAU	hadi.khan@bau.edu.bd	01727203934
12.	Prof. Dr. A. K. M. Zakir Hossain	DPP Committee member	zakir@bau.edu.bd	01713113559
13.	Prof. Dr. Mohammad Mahir Uddin	DPP Committee member	mahir@bau.edu.bd	01747329072
14.	Prof. Dr. Md. Alamgir Hossain	ADB Committee member	alamgircbot@bau.edu.bd	01760178541
15.	Prof. Dr. Md. Rakib Hassan	ADB Committee member	rakib@bau.edu.bd	01857488046
16.	Prof. Dr. Emdadul Haque Chowdhury	Former Director, P&D	emdad001@yahoo.com	01712017381
17.	Prof. Dr. Md. Nurul Hoque	DPP Committee member	nurulhoque86@yahoo.com	01712201102
18.	Mr. Md. Rahat Hossain	ICT Section	didar_rahat@bau.edu.bd	01765849345
19.	Prof. Dr. Harunur Rashid	ADB Committee member	Rashid@bau.edu.bd	01924429971

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No	Name	Institute	Email	Mobile Number
20.	Prof. Dr. Md. Harun-ur-Rashid	Director, P&D	mrashid-69@yahoo.com	01720381581

Figure VII.1: Virtual Consultation, 13 July 2020

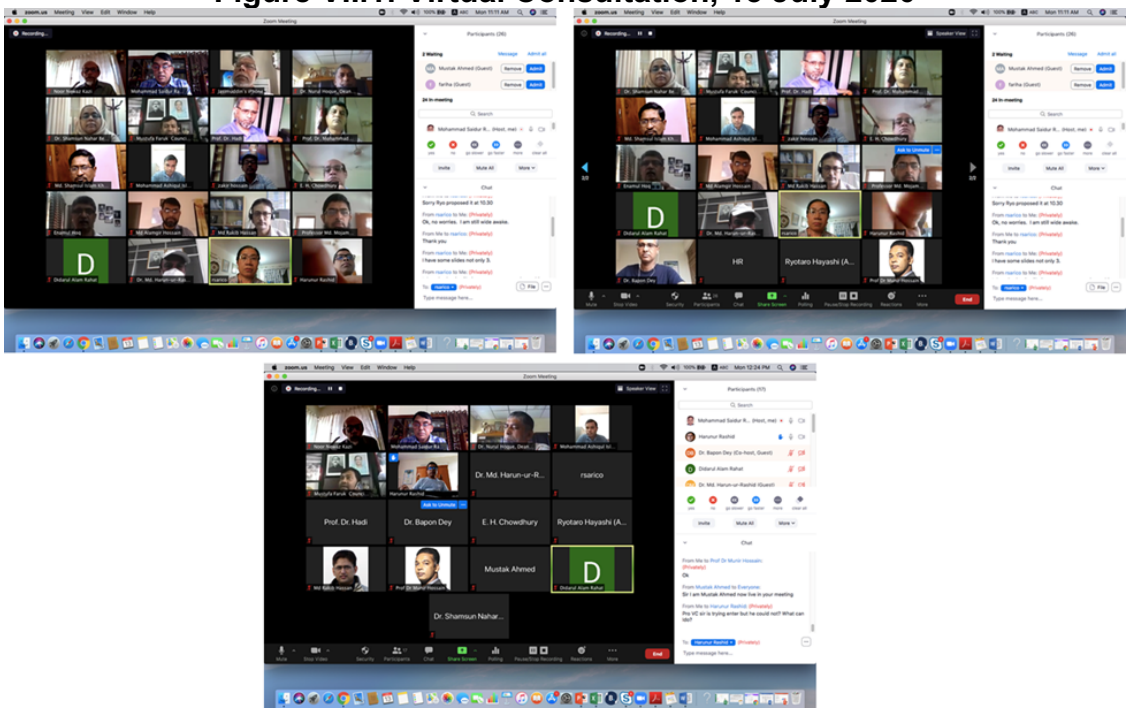


Table VII.2: Summary of Consultations, 13 July 2020

Issues Raised/Suggestions	Response from Project Team
Dr. Mohammad Ashiqul Islam, Manager, Dairy Farm, BAU: • There will be sufficient measures to mitigate environmental hazards caused by the project activities. • Recycling and reusing of dairy wastes should be done. • The project will open opportunities for carrying out research activities for all departments and graduates will be trained to meet the needs of agricultural industries of the country and abroad. • Suggested that earthquake issues need to be addressed at the planning and design stage of the proposed laboratory building.	• Mitigation measures will be implemented for the potential environmental impacts identified. • Earthquake consideration will be part of the design as required by the government's building design code.
Dr. Enamul Hoq, CSO, BFRI: • Consider ecological balance of BFRI-pond complex while constructing the new building, since this 'to be constructed building' is close to the BFRI campus and BAU-BFRI main drainage canal.	Contractors will be required to manage the waste generated appropriately.

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Issues Raised/Suggestions	Response from Project Team
• Suggested for appropriate management of the construction waste materials during project implementation period.	
Dr. Shamsun Nahar Begum, BINA: • BINA expects that the project will enhance the scope for them to carry out research in the proposed new laboratory. • Project will have good mechanisms in place to address environmental hazards arising from chemicals used for molecular research and other research. • Suggested that there should be proper arrangements for treating of wastes generated and scientific disposal and recycling of chemical and other hazardous wastes coming from research during operation period.	Suggestions are well taken.
Dr. Monir Hossain, Manager, AI Centre, Faculty of Animal Husbandry, BAU: • Suggested preliminary assessment of existing waste (both liquid and solid) management practiced in BAU to learn the existing system including related gaps and based on the assessment, the project will have measures, following standard, to install systems toward mitigating environmental hazards arising from research and other activities. • There will be sufficient measures to mitigate environmental hazards caused by the project activities.	Suggestions noted. The project will comply with national requirements and ADB as well as incorporate international best practices.
Dr. Zakir Hossain, BAU: There will be sufficient measures to mitigate environmental hazards caused by project activities.	---
Mr. Faruque, Commissioner, Mymensingh City Corporation: • Thanked BAU administration for arranging the consultation. • Thinks that the project intervention will be helpful for the local people by having better and modern technologies in the agriculture sector and will communicate the message to the mayor of Mymensingh City Corporation.	Thank you for the support to the project.
Dr. Md. Abu Hadi Noor Ali Khan, President, Market Committee, BAU: • BAU will take necessary measures for treatment and management of all kinds of waste before discharges and avoid contamination. • Suggested to include an incinerator facility in the project. • Believes that the project will be helpful for improving the agriculture sector in Bangladesh.	The project will consider the most sustainable and environment-friendly approach to waste management.
Dr. Emdadul Hoque Chowdhury:	---

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Issues Raised/Suggestions	Response from Project Team
There will be sufficient measures to mitigate environmental hazards caused by the project activities.	
Dr. Bapon Dey, Manager, Poultry Farm, BAU: Installation of renewable energy should be considered to help environment.	Rooftop solar PV systems will be included in the project. This is consistent with the government program of increasing renewable energy generation.
Mr. Mostak Ahmed, BAU neighbor (lives near the BAU Dairy Farm): There will be sufficient measures taken in the BAU dairy farm to mitigate environmental hazards caused by the farm.	---
Dr. Nurul Hoque, Dean, AET, BAU: • Alkaline and acidic wastes, including solid waste should be collected & treated separately. • Emphasizes the road connection to the central laboratory facilities.	Will consider the suggestions in the design of the project

2. BAU Online Survey

237. A total of 57 respondents were recorded from the online survey through the BAU project web page conducted in August 2020. The questionnaire is given in Appendix 10 while Table 7.3 presents the summary of the survey results.

Table VII.3: Summary of Online Survey Results

Description	Responses
Awareness of the project	Yes
Source of project information	BAU staff
Perceived impacts of the project	• Improvement in quality of agricultural education and research • Better classrooms and use of up-to-date equipment in agricultural education • Generation of employment • Safety during construction • Air and noise pollution during construction • Disruption of classes or work schedule (class or work schedule disruption) • Potential for small-scale business opportunities
Main concerns/issues about the project	• Transparency and governance during implementation (e.g., recruitment of workers, selection to training, research grants, etc.) • Environmental health, and safety during construction and renovation (ensuring environmental health protection during construction and renovation/expansion) • Management of waste generation during construction and post-construction • Access to opportunities within the project • Emergency response and disaster preparedness for the project and BAU in general • Disruption to daily activities in BAU during construction stage • Community safety during construction • Transmission of diseases in BAU campus due to influx of labor during construction • Air and noise pollution

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Description	Responses
Suggestions on how to address the concerns/issues	• Regular update on progress of the project to BAU community (Regular update on project progress to BAU concerned) • Regular consultations to the BAU community particularly during construction stage • Disclosure of clear and transparent process in job recruitment and training placement (clear and transparent process in recruitment and training allocation) • Public Disclosure of Clear Grievance Redress Mechanism • Contractor responsibility and accountability during construction • Compliance to environmental and social regulations • Monitoring of contractor performance on environmental management • Opening of complaint register at the construction sites • Recruitment of local labor and avoidance of workers camp at BAU campus
Specific concerns/issues	• Community health and safety • Generation of waste • Air quality • Acceptable noise level • Water quality • Clearing of vegetation and land • Employment
Perceived positive impacts/benefits	• Improvement in quality of agricultural education • Opportunities for better and relevant R&D (increase relevant research and development opportunities) • Training for students and faculty (creating training opportunities for teachers and students) • Access to better equipment and educational resources • More comfortable classrooms and educational facilities (comfortable classrooms and educational facilities) • Create more interests in joining the agricultural education • Enhancement of safety condition for female students and faculty (creating safe environment for female students and teachers) • Creation of jobs
Safety of construction-related activities for the project	More than half of respondents think they are safe
Interest in getting information about the project	82% of respondents are interested
Type of information	Main responses - expected impact of the project, progress of project implementation (activities, fund allocation, companies doing the job), R&D, aspect of agricultural education and research facilities the project will improve, transparency/guidelines of participant selection, faculty capacity building, stakeholder consultation
Method of project communication	Project website through BAU, email, workshops, social media

3. Face-to-face Meeting on 20 December 2022

238. As most of the COVID-19 restrictions on social gathering were lifted by the government, a face-to-face consultation was held on 20 December 2022 at the Soyed Nazrul Islam Conference Hall, BAU joined by 103 participants from multi-level stakeholders located within BAU campus and outside BAU campus within Mymensingh District. The stakeholders include BAU academic and administrative members, government and nongovernment officials, teachers, and

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representatives of local association. Table 7.4 gives the list of participants while Table 7.5 shows the summary of issues/concerns raised. Appendix 11 shows the attendance during the consultation.

Table VII.4: Participants, 20 December 2022 Consultation

Location	Description
Within the premises of BAU	a) Dean of all faculties of Bangladesh Agriculture University (BAU) b) Director Graduate Training Institute, BAU c) Heads of Departments of different faculties, BAU d) Director of Mohammad Hossain Central Laboratory e) Chief Medical Officer, BAU f) Representative of Scientist of BINA, BAU g) Representative from BFRI, BAU h) Director BAUEC i) Farmers of BAUEC j) Proctor, BAU k) BAU employees residing around the project area l) Imams from the BAU central Mosque, and other mosques within BAU m) Representative from Bhakti Kutir Temple n) Representative from the BAU Student Council (or organization) and faculty organization o) Representative from BAU Teachers Association p) Representative from BAU Officers Association q) Teachers of K.B. High School, BAU r) Teachers of Muktijoddha School, BAU s) Teachers of K.G. School t) Student from K.B. School u) Local shop keeper v) Head Mater of K.B. High School and Mukti Joddha School w) Representative from ADB x) Committee members of ADB project feasibility study and DPP preparation
Outside of BAU	a) Representative from local government unit (LGED) of Mymensingh District b) Representative of PWD of Mymensingh District c) Representative of City Corporation of Mymensingh District

Table VII.5: Summary of Issues Raised, 20 December 2022 Consultation

Issues raised by the participants	Responses from the BAU project team
There will be traffic jams due to the movement of vehicles carrying construction material during academic class hours of various institutions.	There are a good number of academic institutions located within BAU campus with classes starting from 8:00 a.m. until 5:00 p.m. Therefore, all vehicles carrying goods should use limited movement outside this time frame, follow traffic rules, and avoid pollution as much as possible. Good traffic management plan will be in place.
Labor movements of those engaged in construction work will create problems for BAU campus residents and students.	Construction works and labor movement shall be confined from 8:00 a.m. to 10:00 p.m. During construction activities, the labor movement shall be cautious so that movement of residents and students of campus including vehicles of university and other institutions are not hampered.

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Issues raised by the participants	Responses from the BAU project team
Dust pollution from staking of construction materials (brick, sand, cement, brick cheeps, stone chips etc.)	All the construction materials such as bricks, brick chips, stone, stone chips, construction debris shall be covered with tarpaulin or appropriate material to prevent dispersion of dust. Spraying of water will be continued as required in the construction areas to avoid dust.
Air pollution due to renovation activities	Renovation work shall be completed within the schedule to minimize disruptions. Mitigation measures will be implemented to prevent generation of dust and renovation works will be done outside class hours and prayer time at the adjacent mosque.
Refurbishment work will hamper the daily academic work of BAU	Alternative time management will be explored for the renovation activities to avoid conflict with the academic program.
Social problems may be created due to movement of project workers and other personnel.	Contractors and workers shall be informed about the proper manner/behavior during construction works. Orientation training will be done to avoid any kind of social conflict with campus residents.
Sound pollution during heavy construction works.	During construction, noise shall be reduced to a minimum level to avoid any disturbance to campus residents and during prayer time at the mosque. No construction activities will be conducted after 10:00 p.m.
Accidents may occur due to movement of heavy traffic in the construction area	Proper precaution and traffic management plan shall be implemented to avoid any kind of accident during construction period.
Conflict may arise between local and outsiders during construction works.	Orientation training will be done to contractors and workers on proper behavior and code of conduct to be followed during construction to prevent potential conflict with outsiders. Appropriate measures will be taken also to avoid risk in the livelihood of the local people due to construction works.

4. Online Survey on Disaster Preparedness

239. Online survey for BAU students was conducted in 10-30 November 2023. A total of 1,044 responses was received but only 987 responses were considered due to duplicates. The training and drill on disaster management is only part of a bigger survey to determine students preferred jobs, suggestions toward center of excellence in climate-smart agriculture, suggestions toward leading agropreneurial university, and suggestions toward enhancing responsiveness of advanced agriculture education. Students are self-selected to participate in this survey, thus it does not necessarily the representative data of BAU students. However, the following valuable insights were obtained on training and drills related to disaster preparedness:

- Only 9% of students took training on occupational health and safety standards.
- Only 10% of students took training on climate change risks.
- Only 6% of students took training in disaster preparedness.
- Only 9% of students took training in emergency responses.
- Only 11% of students took training in security and safety.
- Only 3% of students took training in all areas mentioned above.

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- Only 2% of students took part in the fire drill.
- Only 1% of students took all the training and drills above.

E. Consultations and Information Disclosure During Project Implementation

240. **Consultations.** In March 2023, the WHO considered COVID-19 as no longer a global threat, thus usual manner of consultations can now be done such as face-to-face meetings or town hall meetings, focus groups discussions, and interviews will be followed. The PMU will ensure that all the means of communication with stakeholders will include a way to provide comments and suggestions. To achieve this, the PMU office will include an information desk.

241. Consultations will cover the project GRM, construction practices and management, contractor and workers' code of conduct, building management, emergency preparedness, measures to be enforced in case of COVID-19 resurgence or any outbreak of communicable diseases in the workplace and in the community, and the general health and safety measures that will be implemented to ensure the well-being of workers, BAU students, faculty, staff, and the immediate community. The health care cente and other medical facilities in BAU will support the PMU during the information campaign on COVID-19 (if needed), transmitted diseases, and associated health measures associated to construction works.

242. **Information Disclosure**. To comply with the disclosure requirements of ADB, the PMU will create a project web page in the BAU website and will provide a link to project information (e.g., project brief both in Bangla and English, GRM flowchart or flyer, etc.). Printed materials will be made available to interested stakeholders at the project site office and SHED only for essential information like the GRM flyer and project brief (both English and Bangla). A one-page flyer on questions & answers (Q&A) or a frequently ask questions (FAQ) will be also available at the project web page and in print at the project site office and the SHED. A copy of the latest and/or updated IEE will remain at the project site office, BAU and UGC. Table 7.6 gives the summary of the proposed information disclosure program.

Table VII.6: Proposed Information Disclosure Program

Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
Design and Pre-Construction	• Project brief and status of implementation (any change in the design) • Q&A or FAQ flyer • GRM details such as focal person • Executive Summary of the IEE	• BAU project web page • Project site office • BAU project office and SHED • Social media	• Local people within BAU campus that may be affected like students, faculty and staff • Other interested individuals (e.g., NGOs, neighborhood businesses)	PMU, project environmental consultant

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Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
Construction	• GRM, designated staff and contact details • Construction schedule • Traffic management • Waste management • Air, noise, and water pollution measures • Safety and emergency procedures	• Posters or signboards, flyer • BAU Project web page • Relevant local government authorities • Townhall meeting • Social media	• Construction workers and staff • Local population that may be affected (e.g.,businesses, farmers, etc.) • BAU community - students, faculty and staff	PMU, project environmental consultant, contractor (and subcontractor)
Post-construction	• Safety and emergency preparedness and procedures • Building management	• BAU website • Posters or signboards • Social media • Townhall meeting	• Building occupants (i.e., students, faculty, and staff) • Immediate local population	BAU administration, project environmental consultant (if needed)

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VIII. GRIEVANCE REDRESS MECHANISM

A. Handling Grievance through the Government

243. In 2008, the government, through the Cabinet Division, introduced the Grievance Redress System (GRS) - a platform designed to ensure the efficient resolution of complaints regarding services provided by various departments of the government. The GRS website was launched in 2015 and provides guidance on filing of complaints, how to appeal the decision, forms to complete, etc. Figure 8.1 presents the grievance procedure through the GRS. Key elements of the grievance redress mechanism embodied in the GRS includes the following:

(i) Designated focal person (or grievance redress officer) to oversee the GRS
(ii) Process of the grievance redress mechanism (GRM) is publicly disclosed, and a complaint form is provided including receipt of complaint submitted
(iii) Details of the complaint and the decision taken are documented and included in the management information system
(iv) A committee is formed to resolve the complaint based on the GRS Guidelines (Instructions 2015 amendments 2018)[82]
(v) Gender-responsive – during hearings, a female complainant will be assisted by a member of the local government unit, or if from indigenous community, a representative from the community
(vi) Resolution of complaints by the committee is time-based varying from 10 days to 60 days
(vii) Complainant can seek redress in the courts of law at any time during the GRS.

244. BAU adopted the GRS and details of their grievance redressal management are available in the link, https://www.bau.edu.bd/pages/apa.

B. Project Grievance Redress Mechanism

245. SPS 2009 (para. 20, Appendix 1), requires the borrower/client to establish a mechanism of receiving and facilitating the resolution of concerns, complaints, and grievances of people affected by the project's environmental performance. Based on SPS 2009, the GRM should be:

(i) "scaled to the risks and adverse impacts of the project;
(ii) address affected people's concerns and complaints promptly using an understandable and transparent process that is gender-responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution.

The mechanism should not impede access to the country's judicial or administrative remedies. The affected people will be appropriately informed about the mechanism."

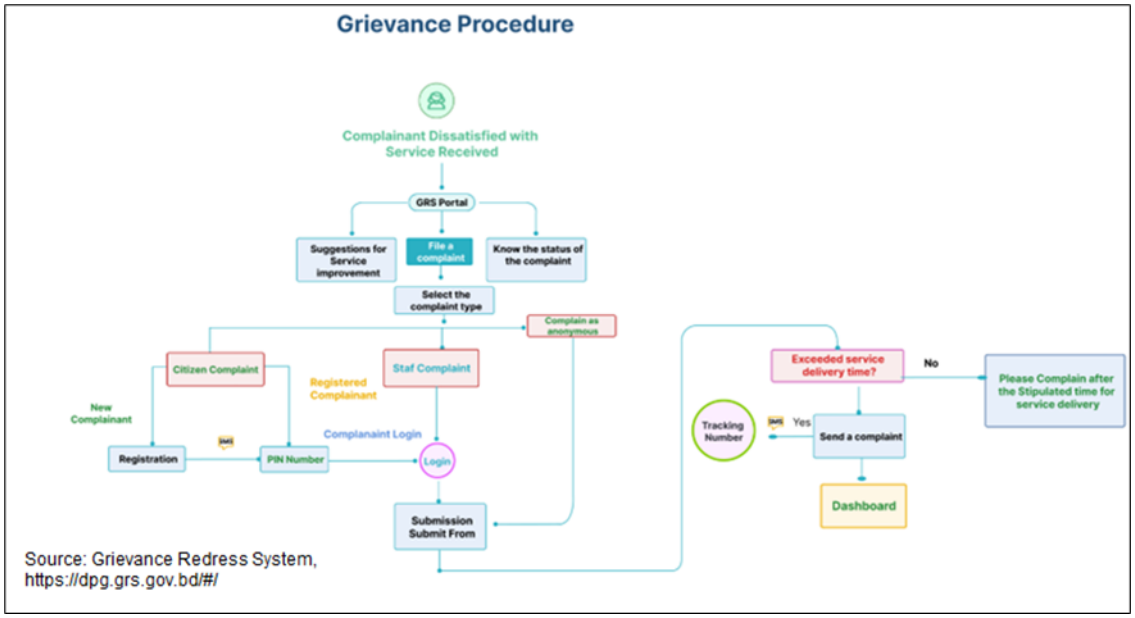
[82] Grievance Redress System,

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246. Like the GRS, key elements will include the following:

(i) Assign a focal person with contact details to manage the GRM
(ii) Information on the focal person, procedures (or flowchart) on filing a complaint, and complaint form will be publicly disclosed through the project website and billboards at the construction site(s)
(iii) Create a grievance redress committee (GRC) to resolve the complaints and members will ensure representation of women and/or member from indigenous people's community (if any)
(iv) Summary of recorded complaints received and resolved will be included in the environmental monitoring report submitted to ADB semi-annually during construction phase and annually post-construction phase
(v) Complainants can seek redress through the DoE (as mandated by the Environment Court Act 2000 amended in 2002 and 2010) of the legal system of Bangladesh at any point in the GRM process.
(vi) When efforts to resolve the grievance through the GRM and concerned ADB operations department fail and complainant still dissatisfied, access the Accountability Mechanism of ADB.[83]

Figure VIII.1: Grievance Procedure through the GRS



247. BAU will establish a GRM to facilitate the process of receiving and resolving complaint(s) promptly from affected persons due to project implementation.

248. In April 2023, ADB published *Good Practice Note on Addressing Sexual Exploitation, Abuse, and Harassment in ADB-Financed Projects with Civil Works,* and in December 2023, ADB further issued a good practice note for ADB-financed projects with civil works on integrating sexual exploitation, abuse, and harassment (SEAH) reporting and case handling into the project

[83] http://www.adb.org/Accountability-Mechanism/default.asp.

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GRM.[84,85] Annex E (p. 58 and p. 60) of the good practice note identifies the following examples of SEAH risks that the proposed project need to consider:

C. Construction and Infrastructure Development

(i) "Construction workers may sexually exploit young boys and girls from surrounding communities who play near the construction site.
(ii) A manager of a resettlement and/or relocation process may tell a community member that they will receive higher compensation or more benefits if they engage in sex with them.
(iii) Drivers employed by the contractor to transport construction materials to and from the site may pay community members for sex.
(iv) Women from the community who are engaged as construction workers on the project may experience sexual harassment by male colleagues or supervisors.
(v) Female workers may be targeted for SEAH by male construction workers, creating a hostile working environment.
(vi) Government enforcers or private security assisting in construction, relocation, or resettlement activities may perpetrate SEAH against members of the affected population (page 58)."

D. Education

249. SEAH risks relating to education projects can occur inside and outside the classroom, around the education facilities (including those under construction), and on the way to and from the facility site. They can occur in primary, secondary, and tertiary education settings and in the education workforce. Students and construction workers can be survivors and perpetrators. Risks are greater in areas such as toilets, changing rooms, dormitories, corridors, and playgrounds, where students are less easily seen or supervised by school staff. If construction work (such as refurbishments or construction of new classrooms or construction of a new road) is taking place in and around the school, construction risks also apply and can take different forms (section A). Examples are as follows:

(i) Construction workers may perpetrate SEAH against girls, boys, or teachers while working on school construction sites. This may occur through exploitative "sugar daddy" relationships between mobile workers with incomes and girls and women of school or university age.
(ii) Teachers may perpetrate SEAH against students, particularly vulnerable students (such as those from minority ethnic groups, poor and vulnerable households, or students with disabilities) in exchange for grades.
(iii) Project staff may ask for sexual favors in exchange for access to scholarships and grants funded by the project (page 60)."

[84] ADB. 2023. Good Practice Note on Addressing Sexual Exploitation, Abuse, and Harassment in the ADB-Financed Projects with Civil Works.
[85] ADB. 2023. Integrating Sexual Exploitation, Abuse, and Harassment Reporting and Case Handling into Project Grievance Redress Mechanism - Good Practice Note for ADB-Financed Projects with Civil Works.

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E. Structure of the GRM

250. **GRC.** Create the GRC, at least within three months upon ADB approval of the project, that will be responsible for deliberating on the complaints received and for deciding on its merits. GRC will convene once a month to review the complaints submitted and overall, will endeavor to resolve complaints within 15 days from the date of receipt. Complaints will be recorded in a Complaints Register (logbook or database) indicating the complainant's details – name, nature of complaint, status of complaint and/or decisions or action taken, and date the decision(s) took effect.

251. Composition of the GRC may include the PMU Head, Union Parishad or local government representative, contractor(s) representative, and PMU representative. UGC and BAU will ensure the representation of women in the GRC. A witness of the complainant can join the meeting to review the complaint/grievance. The assigned focal person for the GRM can act as the secretary of the GRC while the PMU environmental safeguard consultant will join GRC meetings to ensure transparency and objectivity of the process. The GRC will continue to function from construction until post-construction. However, since environmental issues may be of concern mainly during the construction phase, the GRC may be inactive post-construction. GRM may follow the existing BAU GRS (required by the government) during post-construction phase.

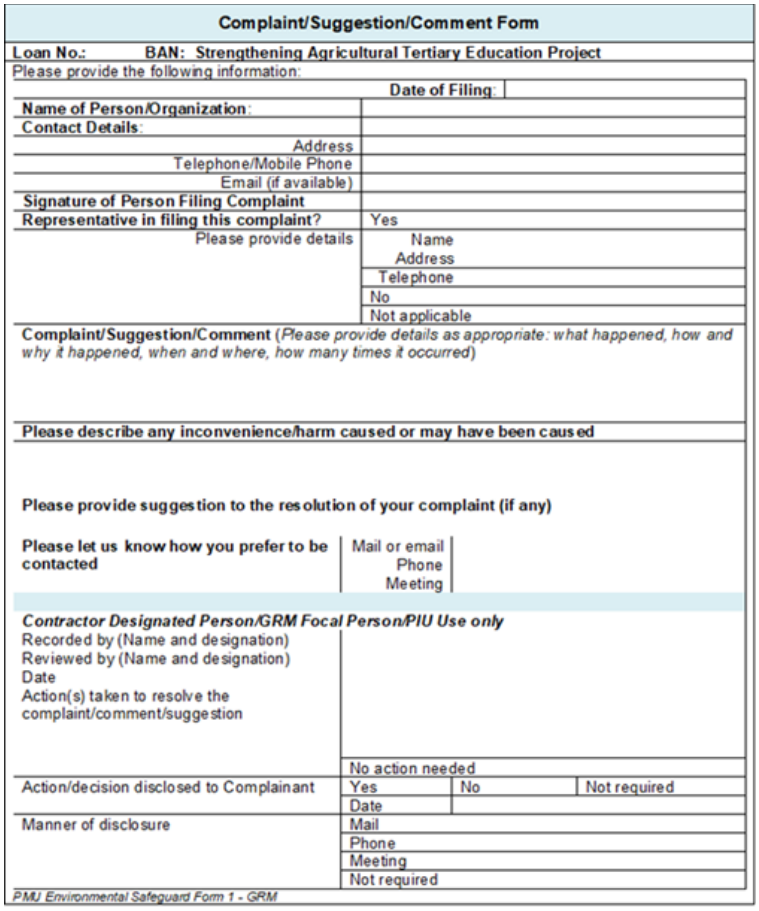
258. **Information disclosure.** The PMU will disclose the details of the GRM through the BAU project website as well as in the billboards at the construction sites. Details will include – assigned focal or contact person, email address, a hotline phone number (and an alternate phone number), and a simplified flowchart on how to file a complaint.

252. **Records maintenance.** Complaints received including contact details of the complainant, date the complaint was received, nature of grievance, decisions, and the date it took effect, and the date the complainant was informed of the decision will be kept in a safe place (or designated cabinet). PMU will determine the retention and/or destruction of these records upon project completion. Complaints received and resolved will be summarized and included in the semi-annual environmental monitoring reports (EMRs) submitted to ADB during construction phase and annually during post-construction/operation phase. The EMRs submitted by PMU and reviewed by ADB will be disclosed in the ADB website as required by SPS 2009 and Access to Information Policy 2018.

253. **Grievance redress procedure.** A complaint can be submitted in different ways: (i) approaching the Site Engineer or the designated person by the contractor (or Subcontractor), (ii) in writing (or email) through the GRM focal person, or (iii) phone call through the GRM focal person. A sample complaint form is given in Figure 8.2. Complaints received will be recorded by the GRM focal person in the Complaints Registry. Subsequently, the complainant will be informed that the complaint was received by the project. Given that resolution of complaints is time-based, the GRM focal person will conduct an initial review of the complaints upon receipt to ensure that the required information is complete and will inform the complainant if further action is needed. The environmental safeguard consultant can help the complainant in filing the complaint.

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Figure VIII.2: Proposed Complaint Form



Complaint/Suggestion/Comment Form

Loan No.: **BAN: Strengthening Agricultural Tertiary Education Project**

Please provide the following information:

	Date of Filing:
Name of Person/Organization:	
Contact Details:	
Address	
Telephone/Mobile Phone	
Email (if available)	
Signature of Person Filing Complaint	
Representative in filing this complaint?	Yes
Please provide details	Name Address
	Telephone
	No
	Not applicable

Complaint/Suggestion/Comment (*Please provide details as appropriate: what happened, how and why it happened, when and where, how many times it occurred*)

Please describe any inconvenience/harm caused or may have been caused

Please provide suggestion to the resolution of your complaint (if any)

Please let us know how you prefer to be contacted	Mail or email Phone Meeting		
Contractor Designated Person/GRM Focal Person/PIU Use only			
Recorded by (Name and designation) Reviewed by (Name and designation) Date Action(s) taken to resolve the complaint/comment/suggestion			
	No action needed		
Action/decision disclosed to Complainant	Yes	No	Not required
	Date		
Manner of disclosure	Mail		
	Phone		
	Meeting		
	Not required		

PMU Environmental Safeguard Form 1 - GRM

254. Grievance redress is three levels – (i) through the PMU or through the Site Engineer of the Contractor, (ii) through the GRC, and (iii) the DoE through the provisions under the Environment Court Act 2000 (amended in 2002 and 2010) or the appropriate courts of law. Access to the legal system through the DoE and appropriate courts of law is not restricted at any stage in the GRM. The three-tier entry points include:

(i) *1st level* – Site Engineer or designated person by the Contractor (or Subcontractor)/PMU Head. The complaint to be resolved at the PMU level within seven days and will advise the Complainant accordingly.

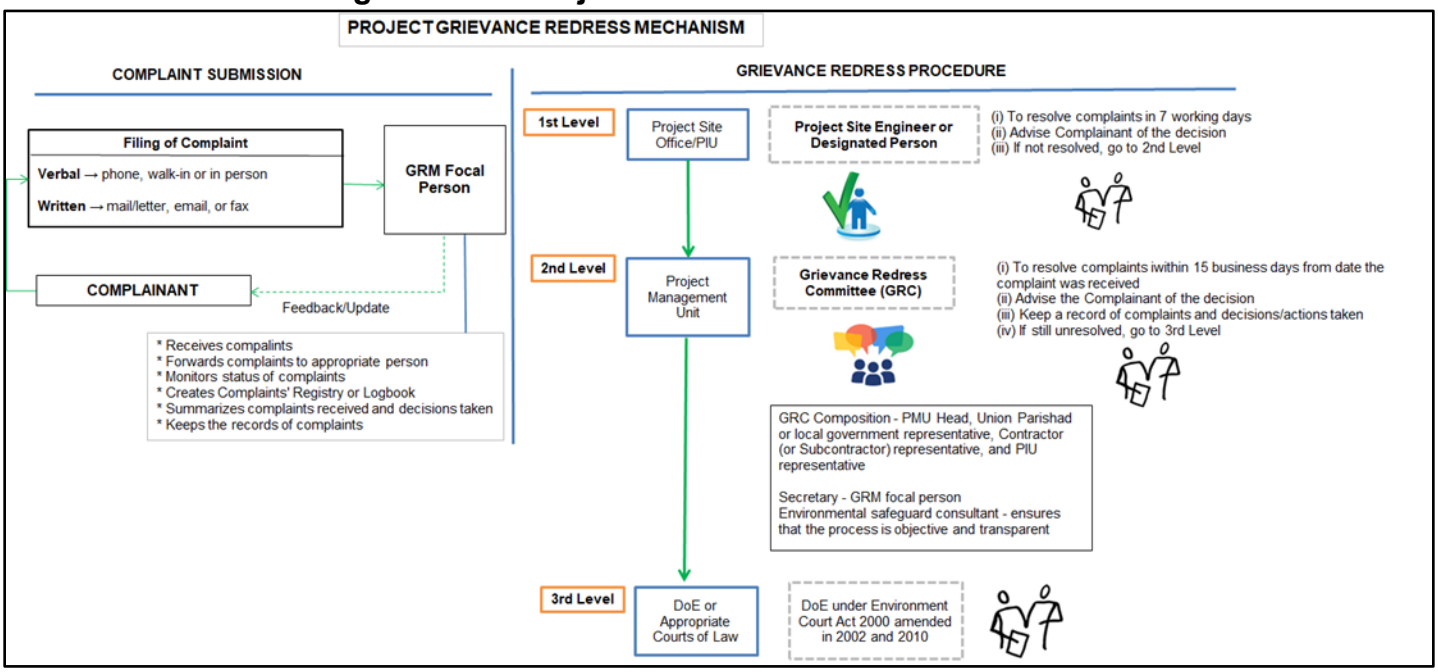
(ii) *2nd level* – GRC. If complaint is not resolved at the 1st level, the Complainant can elevate the complaint to the GRC usually chaired by the PMU Project Director. The Complainant will be assisted by the GRM focal person in elevating the complaint to the GRC. The environmental safeguard consultant will act as alternate person at this level. GRC will review the submission and decide within 15 days. The Complainant will be informed of the decision in person, by mail (or email) or by phone.

(iii) *3rd level* – Appropriate Courts of Law and DOE. If the complaint remains unresolved after the 2nd level, the GRC can advise the Complainant to the DOE or the appropriate courts of law. The Complainant is not restricted to access by the DOE or courts of law at any stage in the GRM.

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255. Figure 8.3 shows the project GRM.

Figure VIII.3: Project Grievance Redress Mechanism



256. **ADB Accountability Mechanism.** Provides an independent process for people adversely affected by ADB-assisted projects to voice and seek a resolution of their complaints/concerns as well as report alleged violations of ADB's operational policies and procedures. The complainant or affected people should make all efforts to resolve the issues by working with the concerned ADB operations department. If still unsatisfied, only then should they access the Accountability Mechanism.

257. **Review of GRM** Implementation of the GRM will be reviewed by the PMU regularly (at least semi-annually) to assess the effectiveness of the process and to examine their ability to address grievances. Input from stakeholders can be considered, particularly those who filed complaints. The cost of implementing the GRM will be part of the administration cost borne by the PMU.

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IX. ENVIRONMENTAL MANAGEMENT PLAN

258. Based on the Feasibility Study (November 2023) and the Development Project Proforma (April 2024) prepared by the government, this environmental management plan (EMP) presents the summary of potential environmental impacts, mitigation measures for the impacts identified, and the monitoring activities required during the different project stages - pre-construction/design, construction, post-construction, and decommissioning. This EMP also describes the implementation arrangements, roles and responsibilities, and capacity building to ensure that the potential adverse project impacts are minimized.

259. The EMP will be included in all bidding and contract documents and the contractors/subcontractors will be informed of their obligations to implement the EMP, and to include the EMP-associated costs in their bids. Since most of the contractors do not have a clear understanding of the need for environmental management, some may quote low for EMP implementation causing problems during project implementation. To avoid this, the PMU may need to emphasize the EMP requirement during the pre-bid meeting.

260. An integral part of the EMP is the environmental monitoring plan (EMOP) which describes the environmental quality parameters that needed to be checked (both qualitatively and quantitatively) during project implementation. Monitoring results will be referred to national requirements such as the ECR 2023 as well as international good practices given in the WB-IFC EHS Guidelines 2007 and other organizations that advance occupational and environmental health such as WHO, OSHA, ACGIH, and the like.

261. **IEE and EMP Update**. Once the design of the new buildings including the scope of renovation/refurbishment works are completed, the IEE and this EMP will be revised and updated to incorporate the changes. As well, if unanticipated environmental impacts became apparent during project implementation, the IEE and this EMP will be updated by SHED of MOE acting through UGC and the BAU, through PMU, to identify the mitigation measures, evaluate options, and the required resources to address them.

262. The project is expected to be completed by June 2029. Table 9.1 presents the EMP.

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Table IX.1: Environmental Management Plan

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
Pre-Construction/Design Stage				
Site survey and design of the new buildings	• Disruption in daily activities and inconvenience to students in Isha Kha Halls, users of Isha Kha Hall Mosque, Kharim Bhaban building, and immediate vicinity of the project site for HCDI and IIFS • Potential traffic and inconvenience to road users within the site for BICAR and the HCDI and IIFS sites	• Coordinate with administrators of buildings that may be affected on the schedule of works that can potentially disrupt them. • Install signposts to alert local people about ongoing works	Project design consultants	PIC, PMU, environmental safeguard consultant
	• Failure of the new buildings to withstand climate change and natural hazards. • Potential safety and health risks to students and building users due to poor building design	• Design will comply with the requirements of BNBC 2020 • Green building features will be incorporated in the design. • Incorporate disaster risk reduction and climate change adaptation measures for cyclone, drought, earthquake, etc. • Relevant codes and standards from international entities such as ASTM, ASCE, World Building Council, International Code Council, International Building Code, and the like will be referred to in the design		
	No staff or resource to oversee environmental aspects of project implementation	• Designate staff in PIC to coordinate with the environmental safeguard consultant in the PMU for technical support. • PIC team will undergo orientation training on the requirements and compliance under SPS 2009, EDCF, and ECR 2023 • Consider engaging intermittent environmental consultant in the PIC instead of assigning staff with only general background and experience	PIC	PMU, environmental safeguard consultant, and ADB
Survey and design for refurbishment of selected academic facilities like the classroom, library, auditorium and sports facilities	• Disruption of services and to daily activities of students and BAU staff in the 17 selected buildings as well as the buildings nearby • Presence of asbestos and asbestos-containing material (ACM) in areas for renovation	• Inform building administrators (e.g., classroom, library, auditorium and sports facilities) on the scope and schedule of work. • Post signs on info about the daily works to be done (or schedule)	Renovation design consultants	PIC, PMU, environmental safeguard consultant

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• Conduct a rapid assessment survey for presence of asbestos or ACM in the existing academic facilities that will require dismantling[86] • Require the contractor to prepare a dismantling plan based on the renovation works for approval by the PIC and PMU • In consultation with building administrators, prepare a dismantling plan for approval by the PIC and PMU		
Integrate EMP in bid documents and contractor's contract	• Exclusion of EMP in cost estimates by bidders • Limited or lack of budget to implement all the measures in the EMP and EMOP	• PMU and PIC will ensure that the IEE and EMP are included in the bid documents. • Provide orientation on the EMP requirements during the pre-bid meeting	PMU and PIC	PSC and ADB
Secure relevant permit, LCC, ECC, consents, etc.	Delay or failure to secure relevant permits and NOCs may potentially delay and/or stoppage of work	• Submit draft IEE to the DOE in July 2024 for review to confirm the orange category and start the process of LCC-ECC application • Secure all required permits and NOCs prior to start of pre-construction/design and construction works. • Designate a staff/worker to oversee the timely issuance of required permits/consents	PMU and PIC	PIC, PMU, environmental safeguard consultant
Update of IEE and the EMP	• Impacts and mitigation measures may not be updated based on detailed design. • Detailed design may not be incorporated in the IEE	• PMU will update the IEE and EMP based on latest design. • Updated IEE will be submitted to ADB for review and disclosure in ADB and BAU websites.	PMU, environmental safeguard consultant	ADB
Stakeholders' consultation	• Consultation should continue throughout the project cycle. • Lack of consultation and participation may cause complaints/grievances from students, faculty, and staff of BAU as well as other residents	• Conduct town hall meeting to inform residents directly or indirectly affected about the progress of project implementation. • Record the issues raised during consultation and include them in the EMR	PIC, PMU, environmental safeguard consultant	PSC and ADB
Selection of sites for storage of construction materials, construction camp (if needed), waste disposal, etc.	Failure to consider environmental implications of the site resulting to adverse impacts	• Consider the average waste generated per person per day and the water requirement per person per day in selecting temporary collection and waste disposal site, and in providing safe water supply to workers.	Contractor	PIC, PMU, environmental safeguard consultant

[86] Refer to ADB, Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (March 2022),

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• Incorporate the environmental aspects in site selection such as proximity to a water body, existing land use (i.e., residential, institutional, etc.), existing sources of noise and air pollution, general topography and potential for erosion will be considered. • Contractor will be required to consider the guidance on workers' accommodation issued by the IFC and EBRD (2009). • Other mitigation measures for site selection of storage area include: (i) securing the area to prevent pilferage and incidence of crime, (ii) provision of clear and visible warning signs around the area, (iii) provision of firefighting system, (iii) lining of impervious material to areas where fuel, oil, and lubricants will be stored, and (iv) persons responsible to manage the storage area will be provided with appropriate training and orientation on the proper handling of these materials and compliance to health and safety rules.		
Disruption of utilities within the site for the new buildings; and academic facilities to be refurbished	Inconvenience to utility users that may result to complaints	• Identify or map existing utilities within the project site. • Coordinate with government authorities on the requirements for utility disruption. • Inform residents and utility users of the potential disruption and the mitigation measures to minimize disruption. • Compensate affected users, if needed.	Contractor	PIC, PMU, environmental safeguard consultant
Biosafety in BICAR	Failure to design or to fully incorporate the safety requirements for biosafety laboratories in accordance with national and international standards may pose health risks to BAU community.	• Design the Building 1 and the animal experimentation facility in compliance to the relevant requirements of the Bangladesh biosafety regulations, BNBC 2020, and to be aligned with the requirements of the Cartagena Protocol as well as the guidelines of the Korean government on the installation and operation of biosafety laboratories (i.e., Integrated Notification of the Act on the Transfer of Genetic Variants between Countries), WHO Biosafety Guidelines, the Bangladesh Biosafety Rules 2012, Biosafety Guidelines of Bangladesh 2020, and the Bangladesh Biosafety and Biosecurity Guidelines		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		for Handling and Disposal of Biohazardous Materials First Edition September 2019.		
Construction Stage				
Recruitment of project staff and workers	• Discrimination over local labor and migrant workers • Resentment over the process and transparency of recruitment	• Contractor will be required to give priority to local labor • Contractor to keep a record of workers' details such as phone number, local address, and email (if any) in case of another outbreak of COVID-19 or other communicable diseases. • Monitor recruitment process to ensure transparency and fairness. • Contractors (and their subcontractors) will be responsible for enforcing the project site regulations and to ensure that their workers strictly observe the rules and regulations of BAU. • There will be zero-tolerance for workers' non-compliance to project site regulations. • Compliance to the relevant provisions in the Bangladesh Labor Act 2006 (as amended 2013) and Bangladesh Labor Rules 2015 on recruitment and working conditions including ADB's Core Labor Standards.	Contractor	PIC and PMU
Briefing of contractor, workers, and project staff environmental requirements	May create a workplace inconsiderate to environmental management due to the following: • Lack of understanding of the EHS requirements • Unfamiliar with the roles and responsibilities in implementing the EMP, compliance with applicable rules and regulations of BAU, ADB, EDCF, and the government	• Conduct orientation and briefing on EMP, GRM, records management, compliance, and reporting required by ADB, consequences of non-compliance to the requirements of the government, ADB, and EDCF • Provide orientation on "chance find" procedures • Identify areas to be monitored and the required mitigation measures. • Create awareness of sexually transmitted diseases such as HIV/AIDs and other communicable diseases like COVID-19 • Explain the Health and Safety Plan (H&SP) • Provide orientation on ADB's good practice notes about sexual exploitation, abuse, and harassment (SEAH) in ADB-financed projects with civil works. • Require contractor to designate staff as emergency and disaster coordinator (Incident Coordinator), and an environmental and	PIC, PMU, environmental safeguard consultant	PSC and ADB

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		occupational health and safety (EOHS) officer to oversee emergency preparedness and compliance to EOHS requirements		
Prepare construction management plan (or construction EMP) for approval of PIC and PMU	• Avoidance of impacts from unplanned activities by contractor • Organized activities and smooth work implementation	CEMP to include the following: • Construction site regulations (i.e., workers' code of conduct, working hours, use of PPEs, prevention of SEAH, etc.) • Occupational health and safety plan[87] • Temporary routes for pedestrians (if needed) and traffic management plan to minimize disturbance from movement of construction vehicles, equipment, and workers. • Spoils disposal and construction waste management • Noise and dust control • Drainage and stormwater management plan to ensure that construction works will not cause ponding or flooding at project construction site and labor camp. • Materials management plan • Community health and safety plan • Emergency/disaster preparedness and response, designate staff as Incident Coordinator • Measures and/or preparedness plan for outbreak of communicable diseases like COVID-19 (e.g., arrangement to medical clinic or hospital, availability of ambulance, etc.) • Designate staff as list of contact details during emergency to workers or post in billboards at construction site • Inclusion of GRM to handle potential complaints	Contractor	PIC, PMU, environmental safeguard consultant
Environmental quality measurements on air quality, noise, and vibration, drinking water quality	• Temporary inconvenience to students and other local people • Improper methods of measurement resulting to inaccurate results • Results to serve as reference data prior to construction works	• Follow the standard method of measurements and selection of sampling sites. • Organize sampling and setting-up of equipment to minimize disruption. • Include results to monthly environmental report to be submitted to PIC	Contractor	PIC, environmental safeguard consultant

[87] See also ILO. 2022. Safety and Health in construction.

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
Source of aggregates for construction and water requirements	Quarrying to supply the required volume for the project may alter landscape and riverbed	• Aggregates will be sourced only from quarries with ECC issued by the DOE • If procured from 3rd parties, Contractor will be required to provide a copy of the ECC • Contractor to provide information and relevant permits (if any) on the source of water for construction, aggregates required, etc. to the PMU	Contractor	PIC, PMU, environmental safeguard consultant
Set up construction camp, construction stockyard, and construction site office	Poor siting and inadequate sanitary facilities may pose occupational and safety risks to workers and degradation of local environment.	Siting will consider the following: • Consultation with local community • Avoidance of agricultural or cultivated land. • Preference for government-owned land • Use of private land to be rented fairly to the landowner. • Construction camp should not be within BAU or close to sensitive areas such as hospital, mosque, etc. and sensitive habitat such as river, any khal or beel • Sites will be approved by PIC and PMU Construction camps will be provided with the following[88]: • Safe and adequate water supply, sanitation, and electricity • Security personnel and fence/enclosures to prevent unauthorized access. • Registry to monitor the number of persons in the camp at any given time. • Septic tank/soak pit of adequate capacity to accommodate the residents. • Adequate fuel for cooking • Health care arrangement with local medical providers in case of illness or accident • Preparations in case of COVID-19 incidence or other communicable diseases • Adequate garbage bins for segregated waste and arrangement for regular collection and disposal • Firefighting system and emergency procedures. • Adequate drainage facilities to prevent stagnant water.		

[88] Refer also to No.6 ILO Helpdesk. Workers' accommodation: processes and standards, Public guidance note by IFC and the EBRD, August 2009.

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		Construction site office will be provided with the following: • Safe and adequate water supply, sanitation, electricity, and designate safety personnel • Septic tank/soak pit of adequate capacity to accommodate the staff. • Health care arrangement with local medical providers in case of illness or accident • Preparations in case of COVID-19 incidence or other communicable diseases • Adequate garbage bins for segregated waste and arrangement for regular collection and disposal • Firefighting system and emergency procedures. Construction stockyard (workshops, equipment wash area, material storage, haul routes and waste disposal) will have the following: • Adequate water supply, sanitation, and electricity • Separate toilets for male and female workers and staff • Septic tank/soak pit of adequate capacity to accommodate the staff. • Health care arrangement with local medical providers in case of illness or accident • Preparations in case of COVID-19 incidence or other communicable diseases • Adequate garbage bins for segregated waste and arrangement for regular collection and disposal • Firefighting system, first aid kit, and PPEs (helmets, goggles, earplugs, safety belt, etc.) and emergency procedures. • Paved area for fuel and lubricant storage and unloading, equipment and machinery repair workshop, etc.		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
	Construction camp and construction stockyard within the construction site of the new buildings may cause greater disruption to the students and staff of BAU, increased noise and dust levels, and waste generated.	Locate the construction camp away from BAU, sensitive receptor like school, hospital, etc., and sensitive habitat like river or swamp.		
Site development – land and vegetation clearing, excavation works, construction works	Disruption and inconvenience to students, faculty, and staff of BAU in the project sites particularly in Isha Kha Hall East and West, Isha Kha Hall Mosque, and other people due to movement of construction vehicles and heavy equipment, increased noise and dust levels, vehicular emissions, transport of construction materials, and disposal of waste	• Implementation of CEMP approved by the PIC and PMU • Inform authorized staff in BAU about the work schedule. • Refer to the environmental code of practice, Appendix 5.	Contractor	PIC, PMU, environmental safeguard consultant
	Loss of some shrubs at the HCDI and IIFS project site	• No known species of conservation status in the site for HCDI and IIFS • Shrubs can be balled for transfer to appropriate location for use during the landscaping once construction works are completed • Landscaping will be done at the site		
	"Chance finds" during excavation and earth moving works	• "Chance finds" procedures will be included in the orientation training of workers prior to construction works		
	Community health and safety risks	• Conduct consultation with people in the immediate vicinity of the construction sites (i.e., students, faculty and staff in Karim Bhavan, Isha Khan Halls and mosques, other residents, BICAR site, etc.) before the start of construction to inform them about the work schedule and construction activities that may potentially affect them. • Mark the areas excavated and provide clear and visible warning signs. • Install appropriate enclosures in excavated areas and provide adequate lighting. • Provide alternative routes and crossings to local people with clear and visible safety signs		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		accommodating elderly, children, and people with disabilities. • Identify the boundary between the construction site and the areas accessible to BAU community and provide temporary enclosures or fences (at least 2 m high), adequate lights, clear and visible warning signs, and danger signals, and take all precautions identified in the community and safety plan of CEMP. • Post visible and clear signs on COVID-19 to continue community awareness and vigilance. • Designate security personnel to prevent accidents, unauthorized access, and to deter pilferage. • Extended parking time of construction vehicles along side streets in the project site will not be allowed. • Rehabilitate immediately any damaged road and pathways to the project site. • Comply with the traffic management plan in the CEMP and direct drivers to follow road regulations. • Designate personnel wearing reflector vests to manage traffic particularly from the main access road to the construction site. • Contractors conduct emergency mock drills regularly, and participation of workers and project staff will be mandatory. • Inform/coordinate with nearby building administrators of Karim Bhavan, Isha Khan Hall, and mosque on the schedule of emergency mock drills. • Contractor (and their subcontractor) will be responsible to ensure that their workers and staff are fit to work.		
	Generation of waste and improper disposal	• Provide orientation/training to workers on proper handling of waste (segregation, collection, transport, and disposal) prior to site development works. • No burning of waste will be allowed.		PIC, environmental safeguard consultant

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• Collected solid waste for transport will be covered with appropriate material (tarpaulin or net) to prevent spillage during transport. • Dispose waste only to government-authorized disposal sites (coordinate with Mymensingh City Corporation) • Mandatory use of PPEs in handling of waste generated. • Reuse Materials (i.e., bins, containers, boxes, etc.) when ever possible • Discharge of water will be monitored to ensure that no localized flooding or erosion will occur. • Liquid waste such as oil drains will be disposed of properly to prevent soil contamination (oil-water separator will be provided at the construction site) • Strict compliance to the waste management plan included in the CEMP. • Contractor and solar panel supplier will be required to provide information about the product to know if damaged and discarded solar panels can be considered hazardous waste or non-hazardous waste so they can be dealt with properly according to the appropriate regulations		
	Workers' occupational health and safety risks (e.g., working on heights, exposure to hand-arm vibration and whole-body vibration, etc.)	• Provide sanitary facilities, appropriate lighting and scaffolding, and safe and adequate drinking water to workers. • Provide temporary place on-site for workers to do their prayers. • Provide workers with appropriate and mandatory use of PPEs. • Monitor compliance of workers to construction safety rules • Provide first aid kits at the construction site. • Install firefighting system at strategic locations within the construction site. • Provide clear and visible posters or signs on general workplace safety, COVID-19 safety measures, and SEAH. • Install handwashing and sanitation stations at designated place, if needed		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• Implement H&SP • Include obligatory insurance for accidents resulting in disabilities or death for construction workers. • Comply with the statutory age requirements for employment as provided for in Bangladesh Labour Rules 2015 including the provisions on occupational health and safety. • Workers assigned to high-level noise even with PPEs will be rotated every 2 hours • Provide orientation to workers about the increased noise levels. • Before start of work, conduct toolbox meetings that last for a few minutes to remind workers on the importance of compliance to the health and safety rules and procedures, and the consequences of non-compliance. • A health personnel or nurse will be stationed at the construction office to inspect labor camps and assist during minor emergency. • Conduct construction site inspection regularly to monitor compliance to OHS regulations (refer to Appendix 6 for sample checklist) • Workers absent from daily toolbox meetings will not be allowed to work. • Conduct emergency mock drills. • Conduct work only from 7 a.m. to 10 p.m.		
	Air quality, noise, and vibration • Use of construction vehicles may increase vehicular emissions. • Transport of materials to construction site may increase dust level. • Excavation, earthmoving works and opened land areas increase dust levels. • Noise level and vibration may increase due to construction vehicles, use of heavy equipment, and construction works.	**Air quality and noise** • Install protective temporary fencing and/or enclosures at construction sites. • Batching and aggregate mixing plant will be located outside of BAU and away from sensitive receptors (i.e., hospitals, residential area, etc.) and habitats (i.e., river, swamp, etc.) • Provision of temporary enclosures (at least 2m high) to noise and dust-generating equipment and activities • Provide space on-site for selected construction materials to reduce trips of material delivery. • Contractors will be required to maintain construction vehicles, equipment, and machineries		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		regularly to reduce emissions, avoid smoke belching, and reduce noise. • Regularly spray water in opened land areas to minimize dispersion of dust. • Transport of dust-generating materials will be covered by tarpaulin or appropriate material. • Cover dust-generating construction materials on-site such as sand, excavated soil, and other dispersible material with tarpaulin (or other appropriate material) • Implement low speed to vehicles entering construction site to reduce noise. • Noise-generating work will be done between 7 a.m. and 10 p.m. only. • Noise-generating works in the renovation/refurbishment of academic facilities that may affect school sessions will be done at night or outside school hours. • Blowing of horns will not be allowed. • Provide PPEs to workers exposed to high-level noise. **Vibration** • Limit the time spent by workers on a vibrating surface. • Avoid continuous exposure by taking rest periods. • Rest the tool on the work piece whenever practical. • Maintain tools properly and do not use faulty tools since that are worn, blunt or out of alignment vibrate more. • Mechanically isolate the vibrating source or surface to reduce exposure. • Ensure that equipment is well maintained to avoid excessive vibration. • Install vibration damping seats and provide vibration dampeners in the form of sleeves or anti-vibration or anti-vibration gloves and boots if workers spend long hours on vibrating tools, machines, etc. at the construction site		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• Provide orientation to workers assigned to tasks exposed to vibration on the proper use of tools and equipment. • Measure the levels of vibration the workers are exposed to and include in the monthly report to be submitted by the contractor to PIC		
• Construction of the new buildings (BICAR, HCDI and IIFS) • Renovation/refurbishment of existing academic facilities about17 buildings) • Installation of solar PV panels in the new buildings and in selected existing buildings	• Non-compliance to relevant regulations • Potential accidents due to working on heights. • Occupational and community safety risks • Generation of waste • Lack of knowledge and experience on solar rooftop PV panels	• Install adequate and appropriate scaffolding and provide safety gear (e.g., safety belts, hard hats, gloves, safety shoes, earplugs, googles, etc.) to workers. • Use of cranes, hoists, and forklifts for unloading, lifting, and placing of panels to ensure safety of workers. • Mandatory use of PPEs • Monitor workers' compliance on safety measures. • Implement CEMP and monitor compliance to the measures identified to minimize adverse environmental impacts. • Engage workers only with relevant work experience on solar rooftop PV panel installation. • Conduct quality assurance upon receipt of solar PV panels. • Provide first aid box with sufficient gauze, bandage, antiseptics, etc.	Contractor	PIC, environmental safeguard consultant
Clean-up of construction sites after completion of construction works	• Improper disposal of construction debris • Occupational and community safety risks • Disruption to traffic and activities in BAU	• Develop a site restoration plan (by contractor) • Restore/reinstate all the areas potentially damaged during construction works. • Workers involved in the clean-up will be provided with appropriate PPEs. • Implement COVID-19 H&SP and safety measures (as needed) • Inform relevant staff in BAU on the schedule of disposal. • Dispose remaining waste and debris to sites approved by Mymensingh City Corporation. Once the construction is completed, all unused materials/waste will be taken away by the contractors (and their subcontractors). All construction sites will be cleared by them, and no payment will be made unless all the construction sites are cleared and approved by the PMU.	Contractor	PIC, environmental safeguard consultant

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
Post-construction stage				
Procurement of equipment for BICAR laboratories	• Generation of waste once the useful life is reached • Occupational health and safety risks on the use and operation • Improper selection criteria • Disregard for sustainable procurement	• Equipment selection made based on the academic staff research requirements in each department • Selection process based on research objectives followed by the workflow and the services required to operate each item • To provide the necessary flexibility in workflow as well as the BSL and hygiene levels, mobile units imported from specialist manufacturers in developed countries were selected • Local furniture supplier considered to minimize environmental impacts due to shipping • Provide training and capacity building of both academic and technical staff - overseas and local training are included in the project • International accreditation of BICAR laboratories to ensure that the operations are synchronized with best practices. • Manufacturers/suppliers of all specialized laboratory equipment will be required to provide on-site hands-on training to designated BICAR staff after installation and commissioning including its environmental implications • Climate-smart precision agriculture and modeling laboratory equipment such as drones will comply with applicable regulations		
Transfer and use of the new buildings.	Improper use and lack of care to the new buildings	• Conduct orientation and awareness to staff and students on proper care of the facility, and the overall structure of the new buildings (e.g., biosafety laboratories, common facilities, animal experimentation, etc.)	PIC, BAU	PMU
	Poor operation and maintenance of solar rooftop PV systems	• Prepare maintenance plan and conduct scheduled preventive maintenance (i.e., quarterly, or semi-annually) such as inspection of solar panels for damages or cracks, cleaning of the PV modules and inverters, checking and monitoring for corrosion and damages of hardware, electrical system, and communication equipment.	BAU (Engineering Section together with the Planning and Development-	

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• The maintenance plan will include details on frequency or maintenance, activities involved, responsible staff, and budget. • Check the status of the solar panels and all related fixation screws, clamps, nuts, and bolts after heavy typhoon with strong winds. • Ensure that no shading of panels occurs over time due to vegetation growth (i.e., HCDI and IIFDS) or future placement of equipment or obstructions on the roof that block the PV modules from direct sunlight (i.e., BICAR, HCDI and IIFS) • No high-pressure water, brushes, or any types of solvents, abrasives, or harsh detergents will be used in cleaning the solar panels. • To prevent bird impacts, reduce open cracks between panels where birds can build nests, use bird netting to seal areas under the panels down to the roof completely around the array, install bird spikes along the top edge of the array to prevent roosting, use plastic owl or falcon with swivel head to scare off birds, and schedule rooftop services and removal of nests based on timing of nesting season.		
	Improper use and poor maintenance of biosafety laboratories and of BICAR in general	• Design and conduct targeted orientation and training program to equip the laboratory staff with the necessary skills, knowledge, and work attitude for managing and monitoring the biosafety labs • Trained staff will develop the capacity of future university and laboratory staff on biosafety. • Develop strategies and explore diverse sustainable funding sources to support the ongoing operations and maintenance of BICAR such as fees, public-private partnerships, grants, contract research, consulting services, technology licensing, and donations • Aside from the biosafety requirements of Korea that need to be complied by BICAR, relevant biosafety regulations (Table 2.1) of Bangladesh need to be complied as well. Bangladesh submits national reports on the implementation of biosafety to the Biosafety Clearing House as part of the	BAU	SHED, MOE

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		commitment to the Cartagena Protocol on Biosafety and the Convention on Biological Diversity where Bangladesh is a signatory. • BAU to prepare and implement a biosafety laboratory manual and biosecurity plan. A biosafety and biosecurity consultant will be engaged by BAU to provide technical support. • An adequate, qualified and experienced staff will be selected to manage the operations of BICAR. A total of 189 technical and non-technical staff will be included in the organizational structure of BICAR.		
	Opportunity for sustained agricultural research laboratory like BICAR	• Prepare sustainability cookbook - a comprehensive guide for implementing sustainability initiatives within BICAR outlining specific strategies, best practices, and actionable steps fit to the unique needs and objectives of BICAR. • Set key performance indicators (KPIs) to track performance of BICAR, identify areas for improvement, and to maintain accountability in achieving sustainability goals. • Establish environmental stewardship in the organizational culture of BICAR, HCDI and IIFS to guide decision-making processes and operational practices to promote resource use efficiency, reducing waste generation, and minimizing carbon emissions throughout the activities of the research laboratories. • Implement sustainable farming practices within the research facility. • Incorporate environmental impact assessments into research projects. • Promote biodiversity conservation and ecosystem resilience through research initiatives.	PMU, BAU	SHED, UGC, MOE
	Generation of waste particularly from the biosafety laboratories in BICAR	• Designate a waste management coordinator for new buildings. • Prepare waste management plan with time-bound targets. • Conduct orientation/training (at least yearly) to students, faculty and staff on waste management,	PIC, BAU	PMU

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		proper collection, segregation (at source), and disposal. • Provide adequate and appropriate garbage bins. • Provide clear and visible posters and signs to create awareness among students. • Promote waste management champions among the students and provide incentives. • Comply with the Bangladesh Biosafety Guideline 2020 on the procedures, the required containment equipment and laboratory facilities given in Appendix 7. • BICAR will use autoclaving (steam sterilization) as the main decontamination method. An efficient and properly operating autoclave will render biohazardous waste sterile so that it can be disposed of safely through the municipal waste. • Three expert committees formed by BAU in identifying the user requirement for BICAR will be supported by a biosafety and biosecurity consultant in preparing and finalizing the BICAR biosafety manual outlining the procedures for autoclaving biohazardous waste, handling of sharps, solid infectious waste, waste labeling, training required, safety and emergency procedures, monitoring and performance indicators, record keeping and reporting, waste disposal and handling of non-infectious and general waste. Aside from the technical guidance provided by the WHO Laboratory Biosafety Manual Fourth Edition and Associated Monographs Laboratory Biosafety Manual Fourth Edition 2020, the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials First Edition September 2019 will provide additional guidance on the appropriate approach contingent to the requirements of BICAR. • Biosafety laboratory manual to be prepared by the BAU will cover both the post-construction phase and the decommissioning phase of BICAR.		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
		• MOE will require the manufacturer/supplier of solar PV panels to cover the disposal and/or replacement through a 'take-back' policy. If the 'take-back' policy is not available during the lifetime of the project, disposal of the waste PV panels will comply with the applicable regulations.		
	Increased demand for electricity and water	• Incorporate estimates (demand load forecast) in the building design. • Install solar rooftop PV system and rainwater harvesting. • Use of energy and water-efficient lighting and water system (e.g., toilet, drinking fountain, etc.) • Periodic check/maintenance of energy (aircon, lights, etc.) and water leaks (faucets, pumps, etc.); immediate repair if faulty to prevent waste or resources. • Educate students, staff, and other building users on water conservation practices	PMU	SHED, MOE
	Occupational health and safety (OSH) risks – working on heights for solar rooftop PV systems, biosafety, and general research laboratories, etc.	• Prepare an OSH program for operation and maintenance (O&M) of the new buildings including the solar rooftop PV systems, i.e., emergency response and procedures, hazard identification, risk, and control of O&M activities. • Conduct regular OHS training that includes workers cleaning the solar panels. • Ensure that guidelines for cleaning the solar panels include safety warning, handling notice, preparation, and cleaning methods. • Conduct safety orientation to cleaners of solar panels on the proper and safe way to clean them, prevention of potential electric shock, and provide proper PPEs	PMU	SHED, MOE
	Use of generator as back-up power supply during power shortfall	• Install super silent generator set with guaranteed noise level of 40 dBA or less, comply with Air Pollution Rules 2022 (SRO. No. 255-Law/2022) and IFC-WB EHS Guidelines 2007 whichever is more stringent. • Provide enclosures to the generator set	PIC, BAU	PMU, PSC
	Incidence of emergency, natural disaster, resurgence of COVID-19	• Prepare/finalize emergency/disaster preparedness plan and procedures.	BAU	PMU, PSC

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
	cases or outbreak of other communicable diseases	• Prepare a biosafety manual and emergency procedures for BICAR based on the requirements of WHO and biosafety regulations of Bangladesh. • Conduct appropriate and regular training on biosafety (about 3,535 m^2 of BICAR is designated as biosafety laboratory, BSL 2, BSL 2+ and BSL3) • Allocate an adequate budget for PPEs and other equipment needed in case on an emergency. • Designate a building disaster coordinator to oversee implementation of emergency/disaster preparedness plan. • Conduct orientation/drills on safety and emergency awareness, and in case of another outbreak of COVID-19 or other communicable diseases. • Provide regular training to relevant staff and students on biosafety emergencies. • Provide clear and visible emergency and safety warning signs and posters (“to do” and “not to do” in case of an event) both in English and Bangla • BICAR to prepare and finalize a biosafety manual as well as the biosecurity plan prior to its operation. BAU has formed three expert committees to define user requirements of the laboratories in BICAR – (1) Committee for Climate-smart Precision Agriculture & Modeling Lab and Post-harvest Technology & Food Processing Lab, (2) Committee for Analytical Lab and Food Safety Lab, and (3) Committee for Genomics & Bioinformatics Lab and Diagnostics and Vaccines Lab. These experts will provide technical support in preparing the plan. The International Centre for Diarrhoeal Disease Research (ICDDR), Bangladesh and the Institute of Epidemiology Disease Control and Research can also provide assistance as they have BSL 2 and BSL 3 laboratories. ICDDR has the first BSL 3 in July 2011. Templates for a biosafety manual and biosecurity plan are given in Annex 4 and Annex 5 of the WHO Laboratory Biosafety Manual Fourth Edition and Associated Monographs, Biosafety Programme Management, 2021.		

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Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Responsibility	
			Implementation	Supervision and Monitoring
Decommissioning stage				
Dismantling activities if the building is no longer safe to occupy	Safety risk to building users	• Repair areas to address safety concerns. • Implement occupational health and safety measures – disconnect utilities connected to the buildings, identify areas with hazardous materials, etc. • Dispose waste generated from the dismantling activities to the government-approved disposal site by coordinating with the Mymensingh City Corporation	BAU	UGC, MOE
	Lack of clarity on the scope of decommissioning posing risks to students, faculty, staff, and other building users	• Prepare a decommissioning plan to determine the extent of work, steps to be taken, resources required (i.e., budget, workers and staff, equipment, etc.), items to be recycled/reused, handling of hazardous substances, cost-efficiency measures, permits required, etc.	BAU	UGC, MOE

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A. Implementation Arrangements

1. Executing Agency

263. SHED acting through UGC will be the executing agency while BAU is the implementing agency. Memorandum of Understanding (MoU) between the UGC and BAU will be signed to clarify their roles and responsibilities.

2. Project Steering Committee

264. A project steering committee (PSC) will be formed as an oversight body and will be chaired by the secretary, SHED, MOE with the participation of the assigned UGC member, vice chancellor of the BAU, and representatives from other agencies as members. The PSC will invite representatives from the private sector and other stakeholders to better align with the needs of the employers. The proposed composition of the PSC is given in Table 9.2.

265. The PSC is expected to do the following:

i) Review the overall physical and financial progress of project and to give necessary direction to accelerate project implementation;
ii) Provide guidelines or formulate policies which may be required in implementing project activities;
iii) Formulate high-level institutional policy framework and policy guidelines for project implementation;
iv) Accelerate and follow-up on the decision-making processes at relevant universities and implementing agencies;
v) Review the viability of the recommendations of reports and studies carried out including the project progress on a regular basis;
vi) Address critical inter-ministerial policy and implementation issues; and,
vii) Manage any other matters related to project implementation.

Table IX.2: Proposed Composition of the PSC

No.	Description	Designation
1	Secretary, SHED, MOE	Chairperson
2	Chairman, UGC or his nominee	Member
3	Vice Chancellor of BAU	Member
4	Vice Chancellor of other universities	Member
5	Joint Chief (Planning Wing) SHED, MOE	Member
6	Joint Secretary (Development) SHED, MOE	Member
7	Deputy Chief, SHED, MOE	Member
8	Representative of NEC-ECNEC & Coordination Wing of the Planning Division	Member
9	Representative of the Concerned Wing/Sector-Division of the Planning Commission	Member
10	Representative of Concerned Sector of IMED	Member
11	Representative of the Programming Division, Planning Commission	Member
12	Representative of Finance Division	Member
13	Representative of Economic Relation Division	Member

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No.	Description	Designation
14	Director (Planning & Development), UGC	Member
15	Project Director, PMU	Member
16	Concerned Senior Assistant Chief/Assistant Chief, SHED, MOE	Member Secretary

Source: DPP, May 2024.

266. The PSC will hold quarterly/ semi-annual/annual meetings and may also meet as and when required to discuss issues relevant to project implementation. PSC will provide special invitation to any person from any other Ministry/Division/institution to implement project if involvement is necessary for project activities.

3. Project Management Unit (PMU)

267. The PMU will be established in the BAU, headed by a full-time Project Director (PD) to provide the required technical, administrative, and logistic support for project implementation. The PD will be at least Additional or Joint Secretary level officer and have project management experience preferably related to tertiary education. SHED of the MOE will appoint the PD. PD will implement the project activities under the guidance of the VC.

268. The PD will be supported by four Deputy Project Directors (DPDs), five Assistant Project Directors (ADs), an accountant and 12 support staff. One of the DPDs, who will oversee the competitive research grant and training, will work at the UGC office in Dhaka as this activity is led by UGC. Out of the 22 posts in the PMU, nine posts will be deputed positions, the accountant will be directly recruited, and 12 support staff will be outsourced.

269. The PMU will implement project activities such as (a) strengthening academic and research infrastructure of BAU, (b) introduction, modernization and accreditation of course-curricula and academic structure of BAU, (c) professional development through training and collaboration at BAU and other agricultural universities, (d) innovation and incubation to commercialize technologies and establish linkages with agro-industry, (e) support national interdisciplinary research for accelerating technology adaptation in agriculture, (f) support networking with leading national, regional and international universities and research institutions, and (g) provide government counterpart fund and personnel to implement and sustain the project outcome and outputs.

270. Specifically, the PMU will (i) prepare the annual operational plans; (ii) undertake procurement activities; (iii) prepare and maintain financial records, accounts, statements and audit; (iv) prepare all consolidated progress reports such as the environmental monitoring reports (EMRs) to be submitted to ADB semi-annually during constructions stage and annually post-construction stage till PCR is issued by ADB, including the midterm review (MTR) report, as well as the project completion report; (v) organize project M&E activities and reporting; (vi) collect and compile progress reports for the PSC and PIC meetings, (vii) prepare documents as required to support reporting arrangements, (viii) coordinate the work of the consultants; and (ix) liaise on project implementation matters with ADB. The PMU will have an adequate number of staff, including DPDs and ADs with professional background in project financial and procurement management of SATEP.

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271. In addition, the PMU in consultation with the UGC and/or VC of BAU will establish (a) overseas and local training selection committee; (b) inspection of civil works committee; (c) purchase committee (tender opening committee [TOC]); (d) technical sub-committee (TSC); (e) tender evaluation committee (TEC) and other committees. A competitive research grant selection committee will be set up for the implementation of the project.

272. The PMU will be responsible also for ensuring that the EMP and EMOP are properly implemented and complied with by the contractors/subcontractors, in submission of EMRs to ADB as soon as the loan becomes effective, and in handling complaints following the grievance redress mechanism (GRM). Given that BAU does not have environmental staff, the PMU will engage a national environmental safeguard consultant prior to the start of construction phase until the occupancy to the new building (i.e., pre-construction/design and construction). The environment safeguard consultant will oversee the environmental concerns/issues of the project and ensure project compliance to the requirements of ADB according to SPS 2009 and the government. Among others, the environment specialist (consultant) should have working experience on compliance monitoring of environment (both occupational and community), health and safety (EHS). During post-construction, the responsibility for compliance with the environmental requirements will be on the administration of BAU. They can engage a consultant or designate staff to oversee EHS issues from post-construction until the project completion report is issued by the ADB which is usually within 1-2 years after the physical completion of the project. The engagement will be also until the contractors have demobilized and the facilities have become functional. The TOR of the environment specialist (national consultant) is given in Appendix 12.

4. Project Implementation Committee (PIC)

273. To review and monitor the progress of project activities regularly a project implementation committee (PIC) is proposed to be constituted. The composition of PIC is given below.

(i) To meet at least once in every three months to review the progress of the implementation of project activities
(ii) Examine the progress of reports submitted by the project authority and take action to accelerate the project activities
(iii) Identify the problem uncounted in implementing project activities and suggest measures/Steps to taken to deal with them and send views to project official for necessary action.
(iv) Review regularly the release and utilization of fund as per work plan and take necessary action to facilitate to release of funds
(v) The Committee may co-opt members, if necessary

274. As required by the Planning Commission, a PIC will be formed headed by the vice chancellor, BAU to (i) give guidance and assistance to PMU; (ii) review the progress of implementation; (iii) review key reports submitted by project authorities and to take action to accelerate project activities, (iv) review regularly the release and utilization of funds based on workplans, and to take necessary action to facilitate the release of funds, and (v) provide support in resolving issues during implementation and to update project officials for necessary action. The PIC may co-opt members, if necessary, and will meet at least once in every three months or as and when required. Table 9.3 shows the proposed composition of the PIC.

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Table IX.3: Proposed Composition of the PIC

No.	Description	Designation
1	Vice Chancellor of BAU	Chairperson
2	Vice Chancellor of other relevant universities	Member
3	Representative from the Planning Wing of SHED, MOE	Member
4	Representative from the Development Wing of SHED, MOE	Member
5	Representative from the Concerned Wing/Sector-Division of the Planning Commission	Member
6	Representative from the Programming Division of Planning Commission	Member
7	Representative of NEC-ECNEC & Coordination Wing of the Planning Division	Member
8	Representative from Concerned Sector of IMED	Member
9	Representative from Economic Relation Division	Member
10	Representative from Finance Division	Member
11	Director (Planning and Development) of UGC	Member
12	Additional Director (Planning and Development) of UGC	Member
13	Deputy Director (Concern desk) P&D of UGC	Member
14	Chief Engineer, BAU	Member
15	Director, Planning, BAU	Member Secretary
16	Project Director, PMU	Member

Source: DPP, May 2024,

275. The PIC will be responsible for managing the day-to-day activities of project implementation and will ensure that the EMP and EMOP are properly implemented, timely reporting to PMU of the EMRs required by ADB, conduct public consultations and information disclosure (as appropriate), and in handling of complaints according to the GRM. Key responsibilities of PIC related to environmental aspects include the following:

(i) Designate a staff to oversee the implementation of the EMP and EMOP;
(ii) Ensure compliance of contractor (and subcontractors) to the EMP and EMOP;
(iii) Undertake public consultations, as appropriate;
(iv) Conduct on-site spot checking to monitor compliance of contractors (and subcontractors) (see Environmental Inspection and Monitoring Checklist in Appendix 6);
(v) In case of non-compliance by the contractors (and subcontractors) or any unanticipated environmental impacts, coordinate with the PMU environmental safeguard consultant in preparing the corrective action plan (CAP) to address the issue with time-bound actions; the CAP will be submitted to ADB for review and will be disclosed to ADB website;
(vi) Ensure that any grievance/complaint received are addressed in a timely manner based on the GRM;
(vii) Keep a record of grievances/complaints received, the decision or action taken, and include the details in the EMR;
(viii) Keep a list of relevant permits issued by the government for the project, if any; and,
(ix) Prepare the EMR and submit it to the PMU for consolidation and finalization by the environmental safeguard consultant. PMU will submit the EMR to ADB as required by SPS 2009 and Access to Information Policy (AIP) 2018.

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5. Civil Works of Contractors

276. The EMP, which includes the EMOP and other relevant plans such as traffic management plan, health, and safety plan (H&SP), will be an essential part of the Bid and Contract documents and will be verified by the PIC and the PMU. The following general EHS obligations will be included in the contractor's contract:

(i) Ensure that the construction of the new buildings including the renovation/refurbishment works complies with (i) all applicable national laws and regulations related to EHS; (ii) the SPS 2009 of ADB; and (iii) all the measures and requirements in the EMP.

(ii) At the minimum, the new buildings will be constructed based on design standards and codes incorporating energy efficiency and green building features. Relevant standards and codes based on BNBC 2020 (and relevant updates) will be complied with and other international organizations such as ASCE, World Green Building Council, ASTM and the like will be referred to. Only low or no volatile organic compound-emitting materials will be selected for paints, coatings, adhesives, carpets, and furniture to ensure high indoor air quality. Water-based nontoxic and non-allergenic paint for drywall or plaster surfaces will be preferred to latex or oil-based paints.

(iii) Always set up a telephone hotline with designated staff during construction working hours to receive complaints/grievances. Contact details will be displayed in billboards clearly at strategic locations within the construction site.

(iv) Provide relevant project information such as construction progress, safety details, and schedule and duration of work/activities that may have associated safety risks.

(v) Secure all the necessary permits and licenses prior to any construction works.

(vi) Provide adequate resources and will designate a qualified staff responsible for ensuring the implementation of the EMP and the EMOP.

(vii) Maintain a record of any EHS incident during the civil works and report to the PIC the details and corrective action taken to ensure no further risks.

(viii) Provide the PIC with written notice of any unanticipated environmental, health, and safety risks or impacts not considered or identified in the EMP. A corrective action plan (CAP) will be prepared in consultation with the PIC and PMU. The CAP will be submitted to ADB for review.

(ix) Comply with the applicable provisions in the Bangladesh Labour Act 2006 and Bangladesh Labour Rules 2015 including the ADB Core Labour Standards as provided for in the standard bidding document on the general conditions of contract on labor: (i) labor laws, (ii) rates of wages and conditions of labor, (iii) working hours, (iv) records of contractor's personnel, (v) prohibition of all forms of forced or compulsory labor, and, (vi) prohibition of harmful child labor.

(x) Keep a record of labor employment including name, ethnicity, age, gender, address, working time, and payment of wages.

(xi) Comply with the provisions on safety and procedures set forth in the BNBC 2020 (and its update) and the Bangladesh Labour Laws 2015 on the building refurbishment works.

(xii) Conduct a rapid assessment survey for the presence of asbestos or asbestos-

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containing materials in the existing academic facilities that will require dismantling contingent to scope of refurbishment works (may refer to ADB Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (March 2022), https://www.adb.org/publications/good-practice-management-control-asbestos).

(xiii) Take necessary precautions to avoid interruptions to water supply, electricity, garbage collection, and other utilities during civil works.

(xiv) Conduct orientation to workers on sexual exploitation, abuse and harassment [may refer to ADB Good Practice Note on Addressing Sexual Exploitation, Abuse, and Harassment in ADB-Financed Projects with Civil Works (April 2023), https://www.adb.org/documents/good-practice-seah-adb-financed-projects and Integrating Sexual Exploitation, Abuse, and Harassment Reporting and Case Handling into Project Grievance Redress Mechanisms: Good Practice Note for ADB-Financed Projects with Civil Works (December 2023), https://www.adb.org/publications/seah-reporting-good-practice-note].

(xv) Take appropriate sanctions against their staff found violating the applicable EHS requirements and non-compliance to the measures provided for in the EMP.

277. The selected contractor should have a designated qualified staff responsible in overseeing the implementation and compliance to the EMP and EMOP during the construction phase. This designated staff will act as the EHS Officer. Also, the contractor and their subcontractors should maintain a record of complaint or grievance submitted at the project level through them including the action taken to address the issue.

B. Monitoring and Reporting

278. The EMOP, based on the requirements of ADB and the government, focuses on the environmental quality parameters that need to be monitored, a time-bound process to ensure that non-compliance of the contractor will be avoided or will be immediately addressed. An EMR will be prepared by the PIC, reviewed by the PMU, and submitted to ADB twice a year during construction and annually post-construction. The EMR submitted to ADB will be reviewed by them and publicly disclosed on their website as required by SPS 2009 and AIP 2019. Submission of the EMR will start as soon as the loan becomes effective and should be submitted to ADB even if only to confirm that no works has commenced. EMR will be submitted to ADB until the PCR is issued by them. Appendix 13 and Appendix 14 show the format or reporting. The cost of implementing the EMOP during the pre-construction/design stage and construction stage will be included in the contractor's contract. The cost estimates of quantitative environmental monitoring (i.e., air quality, water quality, noise, and vibration) are shown in Table 9.4 while Table 9.5 gives the EMOP.

279. **Contractor(s).** The designated environmental staff will submit a monthly compliance and monitoring report to the PIC. The compliance and monitoring report will cover the EMP and EMOP, and the specific EHS clause(s) in their contract. Specifically, the monthly reports will include status of EMP implementation, EHS staffing and training conducted, grievances/complaints received, accidents/near-misses and corrective actions taken, and other parameters as may be requested by the PMU.

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Table IX.4: Cost Estimates for Environmental Quality Measurements (Construction Stage)

Criteria	Parameters	Number of Location/Unit[a]	Unit Charge[b] (BDT)	Total Cost (BDT)
Ambient air quality	PM_{10}, $PM_{2.5}$, NO_2, CO, SO_2, ozone	8	17,000	136,000
Noise	Decibel, dB(A)	8	2,500	20,000
Drinking water quality	fecal coliform, odor, pH, arsenic, lead, cadmium, chromium (hexavalent), chlorides, total hardness, oil and grease, total suspended solids	2	19,000	38,000
Vibration	Acceleration, m/s^2	2	3,000	6,000
Mobilization, sampling cost, reporting		2 days	12,000	24,000
Accommodation for 2 sampling staff		2 nights	3,000	6,000
Estimated cost (excl of taxes)				**230,000** (~ $1,966)
Estimated cost (excl of taxes) of quarterly sampling during construction stage (about 2 years – eight sampling events)				**1,840,000** (~ $15,730)

Notes: [a] -refer to Table 9.5, [b] cost based on baseline measurements for the IEE done by 3rd party provider (2023), Source: TA Consultants,

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Table IX.5: Environmental Monitoring Plan

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
Pre-construction (detailed design)	Orientation of workers on issues like HIV/AIDS, SEAH, COVID-19, compliance with applicable rules and regulations of BAU and ADB requirements	Project site office	Number of participants	• Once • Quarterly or as needed to ensure knowledge is up-to-date	PIC, environmental safeguard consultant	PMU, PSC
	Secure permits and consents	Project site	Verify/inspection of copies of permits and consents	• Prior to start of construction • Yearly (if applicable)	Contractor	PIC, environmental safeguard consultant
	IEE/EMP in the Bid documents	Project site office	Inspection of signed bid and contract documents	Once prior to construction	Contractor	PIC, environmental safeguard consultant
	Environmental quality measurements	Project site	Sampling for – • Air quality – PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, O_3 (new building site) • Noise • Vibration Drinking water quality	Once prior to construction	Contractor	PIC, environmental safeguard consultant
	Good housekeeping including health and safety measures	Project site office	• Ocular inspection • Bins provided • Area for temporary collection of waste • Number of working hands washing stations • Number of working hand sanitizing stations (if water and soap are not available) • Available stock of gloves, facial masks to workers and staff, and other personal protective equipment (PPE)	Weekly	Contractor	PIC, environmental safeguard consultant

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Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	Condition of sanitary facilities and safe drinking water	Project site office	Ocular inspection, spot checks	Weekly	Contractor	PIC, environmental safeguard consultant
	Recruitment of workers and staff for construction stage	Project site office and project site	Number of local workers and staff recruited	Monthly	Contractor, PIC	PMU
	Use of PPEs	Project site office and project site	Ocular inspection, spot checks	Weekly	Contractor	PIC, environmental safeguard consultant
	Clear and visible safety and warning signs	Project site office and project site	• Ocular inspection • Number of signs and location • Posters on COVID-19 and other communicable diseases	Weekly	Contractor	PIC, environmental safeguard consultant
Construction	Orientation of contractor and workers on issues like EHS, HIV/AIDS, SEAH, COVID-19, compliance with applicable rules and regulations of BAU, EMP and ADB requirements	Project sites – new building and buildings for renovation	Number of participants	• Once Quarterly or as needed to ensure knowledge is up-to-date	PIC, environmental safeguard consultant	PMU, PSC
	Good housekeeping including health and safety measures	Construction site, temporary workers' shelter or rest areas, construction camp	• Ocular inspection or spot checks • Number of bins • Area for temporary collection of waste • Number of working hands washing stations • Number of working hand sanitizing stations (if water and soap are not available) • Available stock of gloves, facial masks to workers and staff, and other personal protective equipment (PPE)	Weekly	Contractor	PIC, environmental safeguard consultant

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Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	Generation of waste and other construction debris	Project site construction	Volume of waste or number of collection trips	Weekly	Contractor	PIC, environmental safeguard consultant
	Increase in dust level containment measures	Project site construction	• Frequency of water spraying • Ocular inspection • Enclosures of dust-generating activities • Number of trainings on proper use of PPE for workers to reduce exposure	Daily	Contractor	PIC, environmental safeguard consultant
	Increase in noise level abatement measures	Project site construction	• Ocular inspection • Enclosures of noise-generating activities or machinery • Check blowing of horns (new building)	Daily	Contractor	PIC, environmental safeguard consultant
	Ambient air quality	Project site – sampling stations (AAQ3, AAQ6, AAQ7, AAQ5 -refer to Chapter 4, Description of Existing Environment)	• PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, ozone	Quarterly	Contractor	PIC, environmental safeguard consultant
	Ambient noise level	Project site – sampling stations (ANL3, ANL5, ANL6, ANL7 – refer to Chapter 4, Description of Existing Environment)	Sound level meter (dBA)	Quarterly	Contractor	PIC, environmental safeguard consultant
	Vibration level	Project site and project construction site office – sampling stations (S1-Kharim Bhavan and S2- Isha Kha Hall/Mosque area)	Acceleration, m/s^2	Quarterly	Contractor	PIC, environmental safeguard consultant

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Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	Availability of project information	Project site office	• One-page flyer, project brief or Project Q&A (Bangla and English) • Poster and flyer on COVID-19 and SEAH (Bangla and English)	Quarterly	Contractor	PIC, environmental safeguard consultant
	Solid waste management	Project site construction	• Number of appropriate bins • Temporary collection area	Monthly	Contractor	PIC, environmental safeguard consultant
	Clear and visible warning signs for safety of workers and BAU community	Project construction site and access roads	Ocular inspection/spot checks	Once a month	Contractor	PIC, environmental safeguard consultant
	Announcement of work schedule to the local community that may be affected	BAU	Work schedule log sheet	As needed	Contractor	PIC, environmental safeguard consultant
	Smoke belching construction vehicles	Project construction site and access roads	Ocular inspection or spot checking	Weekly	Contractor	PIC, environmental safeguard consultant
	Handwashing stations with adequate soap and water, or hand sanitizers with at least 60% alcohol	Project construction site and temporary workers' shelter or rest areas	• Ocular inspection/spot checks • Number of working hands washing stations • Number of working hand sanitizing stations (if water and soap are not available) • Available stock of gloves and facial masks to workers and staff	Daily	Contractor	PIC, environmental safeguard consultant
	Use of PPEs	Project construction site	Ocular inspection or spot checks	Daily	Contractor	PIC, environmental safeguard consultant
	Condition of sanitary facilities and safe drinking water	Project construction site	Ocular inspection or spot checks	Everyday	Contractor	PIC, environmental safeguard consultant
	Drinking water quality	Project construction site	Water testing – pH, color, odor, As, etc., (refer to national	Quarterly	Contractor	PIC, environmental safeguard consultant

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Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
			drinking water quality standards and WHO)			
Post-construction	Orientation of students, faculty, and administrative staff on care and maintenance of the building	New buildings (e.g., HCDI, IIFS, BICAR)	Number of trainees	Annually (or at start of each term)	BAU	PIC[a]
	Good housekeeping (also garbage collection and disposal)	New buildings (e.g., HCDI, IIFS, BICAR)	Ocular inspection or spot checks	Monthly	BAU	PIC
	Condition and maintenance of fire extinguishers, fire- fighting units and fire alarms	New buildings (e.g., HCDI, IIFS, BICAR)	Ocular inspection or spot checks	Annually	BAU	PIC
	Orientation on the safety, emergency, disaster manual and procedures	New buildings (e.g., HCDI, IIFS, BICAR)	• Check manuals • Check logsheets	Quarterly (with COVID-19 consider monthly)	BAU	PIC
	Emergency mock drills	BAU	Number of trainees	Semi-annual (or every start of term)	BAU	PMU
	Condition of solar PV panels	Rooftop of BICAR, HCDI and IIFS	Ocular inspection – birds' nests, cracks/damage, use of PPEs of workers cleaning, availability of PPEs	Quarterly or semi-annually	BAU	PMU
	Greening program/grounds maintenance	New buildings (e.g., HCDI, IIFS, BICAR)	Types of plants, area planted	Annually	BAU	PIC
	Condition of safety gears and emergency equipment	BAU	Ocular inspection or spot checks	Annually	BAU	PIC
	Building condition • Solar rooftop PV systems • Roof • Electrical panel and wiring • Door handles, windows, hinges, and closures • Walls and ceilings • Stairways and fire exit or escapes • Storm water drains • Elevators	BAU	Ocular inspection or spot checks for cracks, signs of water leaks, damage, fire hazards, etc.	Semi-annual	BAU	PIC

[a] Only until the loan is implemented.
ADB = Asian Development Bank, PIC = project implementation committee, PMU = project management unit.

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C. Capacity Building

280. Table 9.6 presents the proposed training program during implementation and may be revised/updated as needed.

Table IX.6: Proposed Training Plan

Training	Required Attendees	Mode of Delivery	Proposed Duration	Conducted by	Source of Funds
Pre-construction/Design and Construction Stages					
Topics– 1. ADB SPS 2009 – requirements and compliance (EMP, EMOP, reporting 2. EDCF Safeguard Policy 2020 3. WB-IFS EHS General Guidelines as applicable to the project 4. National requirements such as ECR 2023 standards to be complied, OHS rules, Labor laws, other relevant regulations, or rules	BAU staff, PMU, PIC, contractor's project team, Subcontractor project team, environmental safeguard consultant	• Lectures • Case studies • Q&A	1 day	Project Construction and Supervision Consultant (PCSC)	PCSC budget
• Project EMP implementation • EHS and OHS issues – good housekeeping, waste management, use of PPEs, emergency preparedness, workers' code of conduct, SEAH and gender issues. • GRM	BAU staff, PMU, PIC, contractor's project team, Subcontractor's project team, environmental safeguard consultant, GRM focal/designated person, GRC members, representatives from DoE and Department of Labor, representative from local government units	• Lectures • Case studies • Q&A	1 day	PCSC	PCSC budget
Post-construction Stage					
Orientation on the Disaster Management and Emergency Response Plan, and Business Continuity Plan	BAU Faculty members and staff, representatives from student associations, representative from relevant government authorities	• Lectures • Workshops • Seminar	1 day done every start of school term until end of project loan (June 2029)	BAU Emergency Incident Coordinator or designated staff, BAU Emergency Response Team	BAU operations budget

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Training	Required Attendees	Mode of Delivery	Proposed Duration	Conducted by	Source of Funds
Orientation on the operation & maintenance of biosafety laboratories[a]	Relevant staff of BICAR	• Lectures • Workshops • Seminar	One day	Resource persons (e.g., WHO, ICDDR, etc.)	BAU operations budget
Emergency response and disaster preparedness	BAU students, faculty, and staff	• Lectures • Drills	Half-day once every school term	Resource persons (e.g., Bangladesh Red Crescent Society, UN Disaster Risk Reduction, etc.)	BAU operations budget
Good Practice Note on ADB Sexual Exploitation, Abuse, and Harassment (SEAH) as applied to education sector project	BAU Faculty members and staff, representatives from student associations	• Lectures • Workshops • Seminar	Half-day	BAU designated staff on gender issues, representative from BAU Student Affairs Division	BAU operations budget

[a] Comprehensive training on biosafety – there will be two batches of training, each batch covering 30 days for laboratory officers, technicians and maintenance engineers for the operation of BICAR. The training will target 100 participants. A training at the NICEM in SNU which became a model for BICAR, will be included. There will also be five batches of training (including foreign training at SNU-NICEM) and attachment of a pool of BAU teachers with the thematic laboratories under BICAR targeting 100 participants.

281. Aside from the training program, BAU, through the PIC will also prepare and approve its disaster management plan, and the business continuity plan; and will organize training for OHS, disaster risk reduction and climate risks. BAU will also conduct earthquake evacuation and fire drills to ensure the safety of students and faculty members.

282. The disaster management plan will include (i) formulation and strict implementation of safety codes and measures; (ii) periodic inspection of firefighting equipment and its planned maintenance; (iii) create awareness among the students about electric shock; (iv) declaring the school office as “no smoking zone”; (v) mock drills by the firefighting cells/groups, disaster management trainings among students and teachers, etc.

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X. CONCLUSION AND RECOMMENDATION

283. SATEP aims to enhance industry responsiveness of advanced climate-smart agricultural tertiary education and research in Bangladesh and to develop BAU as the center of excellence on agricultural tertiary education, build a modern technology-responsive agricultural tertiary education system, create facilities and enabling environment for innovative R&D, and to promote enhanced linkages between academia and agro-industry. Through SATEP, BICAR will be established which can conduct high quality research and will be able to serve as South Asia regional hub of global high-tech climate-smart agricultural network.

284. SATEP envisions to address the challenges in the agriculture sector recognizing that tertiary agricultural education is a critical support in the improvement of agricultural productivity, and in adaptation to climate change impacts.

285. Due diligence for the project was undertaken based on the requirements of SPS 2009 with due consideration to the government's ECR 2023 and EDCF Safeguard Policy 2020. Based on SPS 2009, the project is environment category B requiring an IEE and based on ECR 2023, the project is anticipated to be orange category also requiring an IEE. Similarly, with EDCF Safeguard Policy 2020, SATEP is likely to be category B project. This draft IEE will be submitted to the DOE for review and confirmation of the orange category to start the application process for securing the ECC.

286. The scope of the environmental assessment covers the project cycle of design/pre-construction, construction, post-construction, and decommissioning. The identified adverse environmental impacts will have corresponding mitigation measures included in the EMP, and environmental monitoring activities will be done during project implementation guided by the environmental monitoring plan. The EMP, to be included in the bid documents and civil works' contract, outlines the mitigation measures required to address the adverse impacts, the responsibility for implementation, and compliance monitoring. The status of EMP implementation will be included in the environmental monitoring reports (EMRs) which will be submitted by the PMU to ADB semi-annually during construction stage and annually post-construction. The EMRs will be disclosed to the ADB website as required by SPS 2009 and AIP 2018.

287. The IEE has established that the adverse environmental impacts are mainly associated with the construction of the new buildings (e.g., HCDI, IIFS and BICAR), and the renovation of selected existing buildings such as the classroom, library, auditorium and sports facilities. Adverse impacts include generation of construction wastes, increased dust and noise levels, disruption of daily activities from transport of materials and workers, and presence of workers at the construction site. Prior to renovation works, a survey will be conducted to check for the presence of asbestos or asbestos (ACMs). If any, safe handling, and disposal of ACMs will be guided by the requirements of ADB, and international best practices from WB-IFC, OSHA, WorkSafeBC, and the USEPA. These impacts are of short duration, temporary, reversible, and can be readily mitigated by best practices in engineering construction and project management, and compliance to occupational and environment health and safety standards of the government and international best practice from the WB-IFC EHS General Guidelines 2007. The new buildings will be designed incorporating green building features on energy and water efficiency, compliance to the relevant codes and standards from the BNBC 2020 and international professional associations such as ASCE and ASTM, constructed using

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sustainable materials, adopting climate and disaster-resilient design, and procurement of Energy Star-certified products to the extent possible.

288. An emergency preparedness and disaster management plan which includes a business continuity plan will be prepared during the detailed design of the new buildings and will be finalized prior to occupancy. These plans that cover the entire BAU operations will be prepared in consultation with the students, faculty, staff, and the immediate communities within BAU. Part of these plans will be capacity building to ensure that stakeholders understand the "how to" and "what not to do" in the event of an emergency or disaster.

289. Beneficial impacts include creation of jobs, opportunities for small-scale local businesses, professional development for BAU faculty, students and staff through training and R&D projects as well as the use of new facility equipped with advanced instrumentation and resources.

290. To address potential complaints and grievances from affected people, a grievance redress mechanism will be established by the PMU as soon as the project has been approved by ADB and became effective. Stakeholders' consultation which started during the preparation of the IEE will continue until project completion. Relevant project information such as the GRM will be publicly disclosed through the BAU, SHED, construction billboards and project web page.

291. To ensure compliance to the environmental requirements of ADB and the government, an environmental safeguard consultant will be engaged by the PMU throughout the construction phase to provide technical support and capacity building. During post-construction, BAU will designate a focal person to oversee compliance to environmental requirements of ADB. BAU and SHED are aware of their responsibility during project implementation and are committed to complying with the requirements of ADB and the government. Given the due diligence conducted under SATEP, results reveal that the IEE is adequate and there is no need for an EIA based on SPS 2009.

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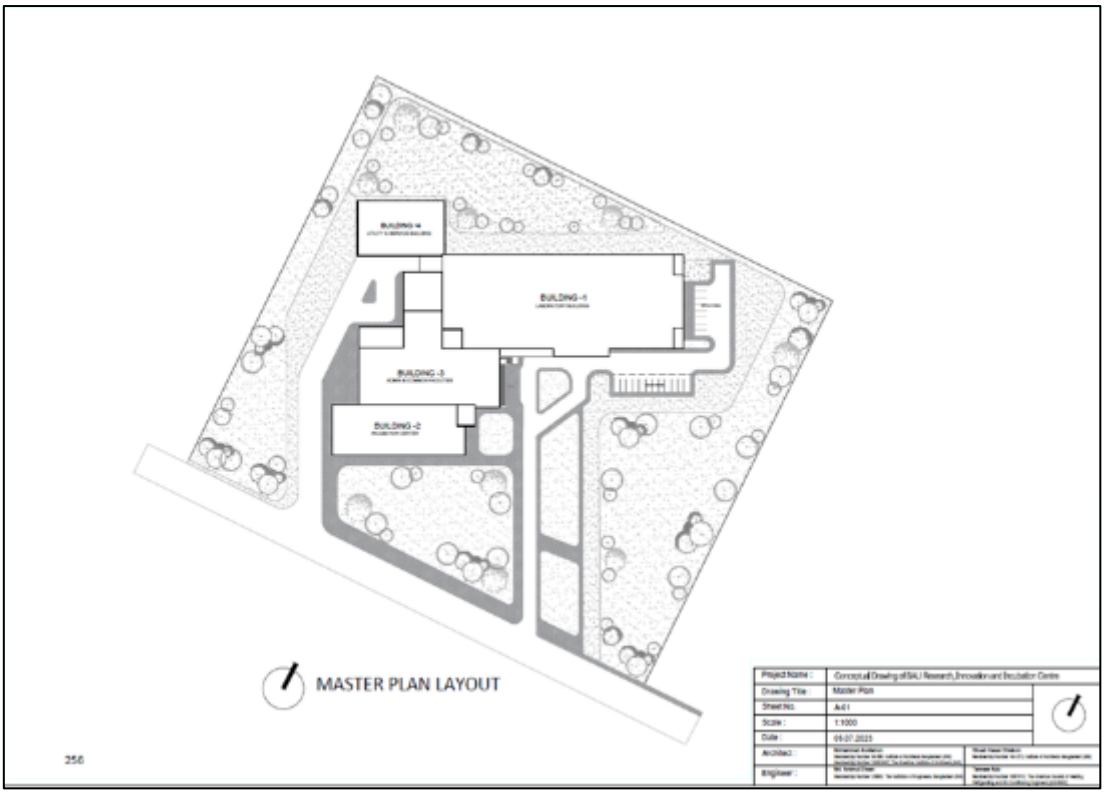
APPENDIX 1

BUILDING DESCRIPTION AND CONCEPTUAL MODEL

1. The following details were taken from the DPP, April 2024 prepared by the Government.

BICAR





Serial No	Floor	Program	Area(sqft)
01	Basement	Imaging laboratory	56,144.49
		Climate-smart precision agricultural & modeling laboratory(part),Multipurpose Hall,Utility	
02	Ground Floor Plan	Analytical Laboratory(part 01)	73,711.99
		Reception,Multipurpose Hall,Incubation center,Food corner	
03	First Floor Plan	Analytical Laboratory(part 02)	60,043.00
		Directors Office,Incubation center,Food Corner	
04	Second Floor Plan	Climate-smart precision agricultural & modeling laboratory	46,821.33
		Incubation center	
05	Third Floor Plan	Climate-smart precision agricultural & modeling laboratory	46,821.33
		Incubation center	
06	Fourth Floor Plan	Post-Harvest Technology & Food Processing Lab	46,821.33
		Incubation center	
07	Fifth Floor Plan	Food Safety Laboratory	36,366.74
08	Sixth Floor Plan	Genomics & Bioinformatics Laboratory	36,366.74
09	Seventh Floor Plan	Diagnostics & Vaccines Laboratory	36,366.74
	Sub-Total Area		**43,9463.70**
10	Ground Floor Plan	Animal Experimentation Facility	20,744.00
		Animal Experimentation Facility (Another compound)	
	Total Built Area		**46,0207.7**
	Site Area		**34,2002.245**

A. Conceptual layouts and requirements for seven different laboratory divisions

2. The seven laboratory divisions will be of a different nature and will be performing different types of activities. Hence, their requirements in terms of the organization of laboratory rooms and support facilities, workflow, biosafety, entry and exit procedures, airflow, etc. will be different. The expert committees have proposed the layout and requirements of each laboratory division from the user perspective. The BAU authority formed three expert committees to define user requirements of the laboratory – (1) Committee for Climate-smart Precision Agriculture & Modeling Lab and Post-harvest Technology & Food Processing Lab, (2) Committee for Analytical Lab and Food Safety Lab, and (3) Committee for Genomics & Bioinformatics Lab and Diagnostics and Vaccines Lab.

(i) Imaging Laboratory

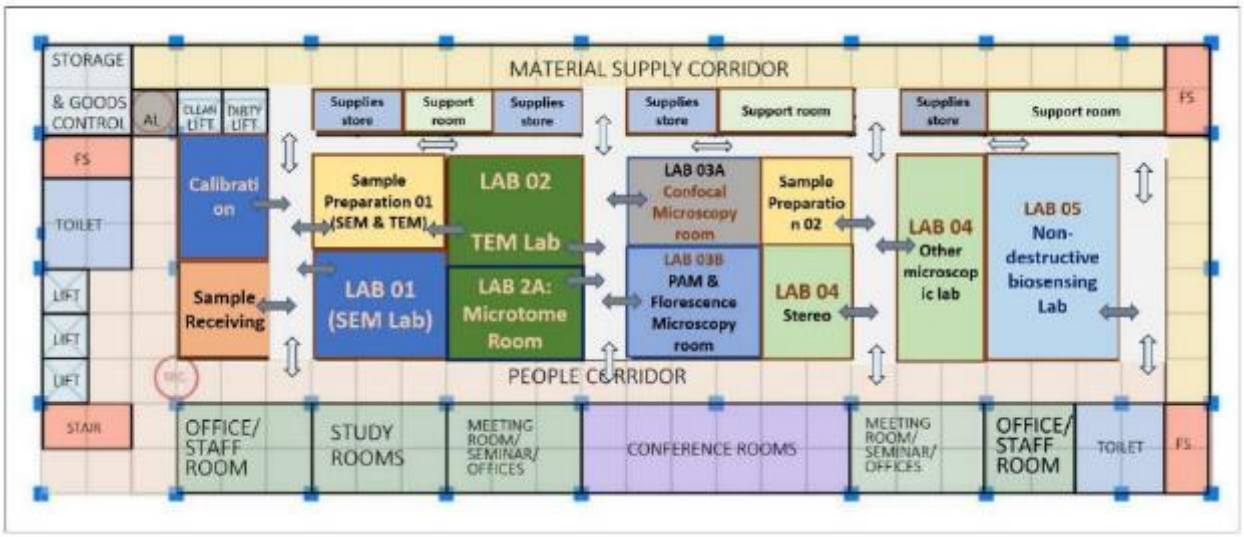
3. Purpose: Providing a whole range of imaging services

4. Brief description: The laboratory will have three major sections in addition to sample receiving, storage, other support areas and the office areas. The three major sections are the electron microscopy section (both scanning and transmission electron microscopy), confocal, fluorescence and stereo microscopy, and the third section for other types of microscopy and the non-destructive bio sensing analysis.

5. Special requirements: No special requirements except HVAC, dust-free clean environment and secured entry.

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Proposed conceptual layout of the Imaging lab (from the user perspective):

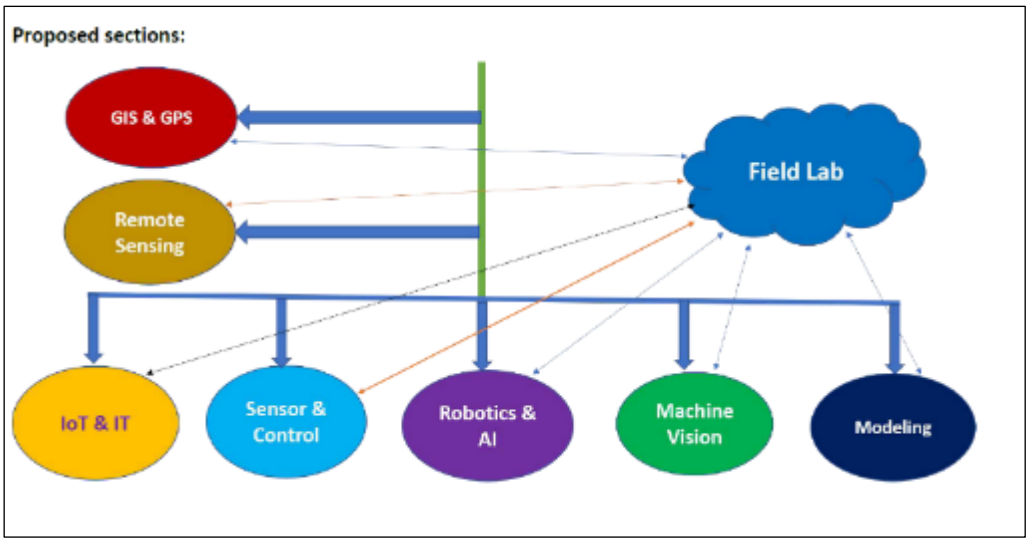


(ii) Climate-Smart Precision Agriculture and Modeling Laboratory

6. Purpose: Conducting research using GIS, GPS, RS, sensors, drones, robotics & AI, IT & IoT for ensuring profitable and sustainable farming system.

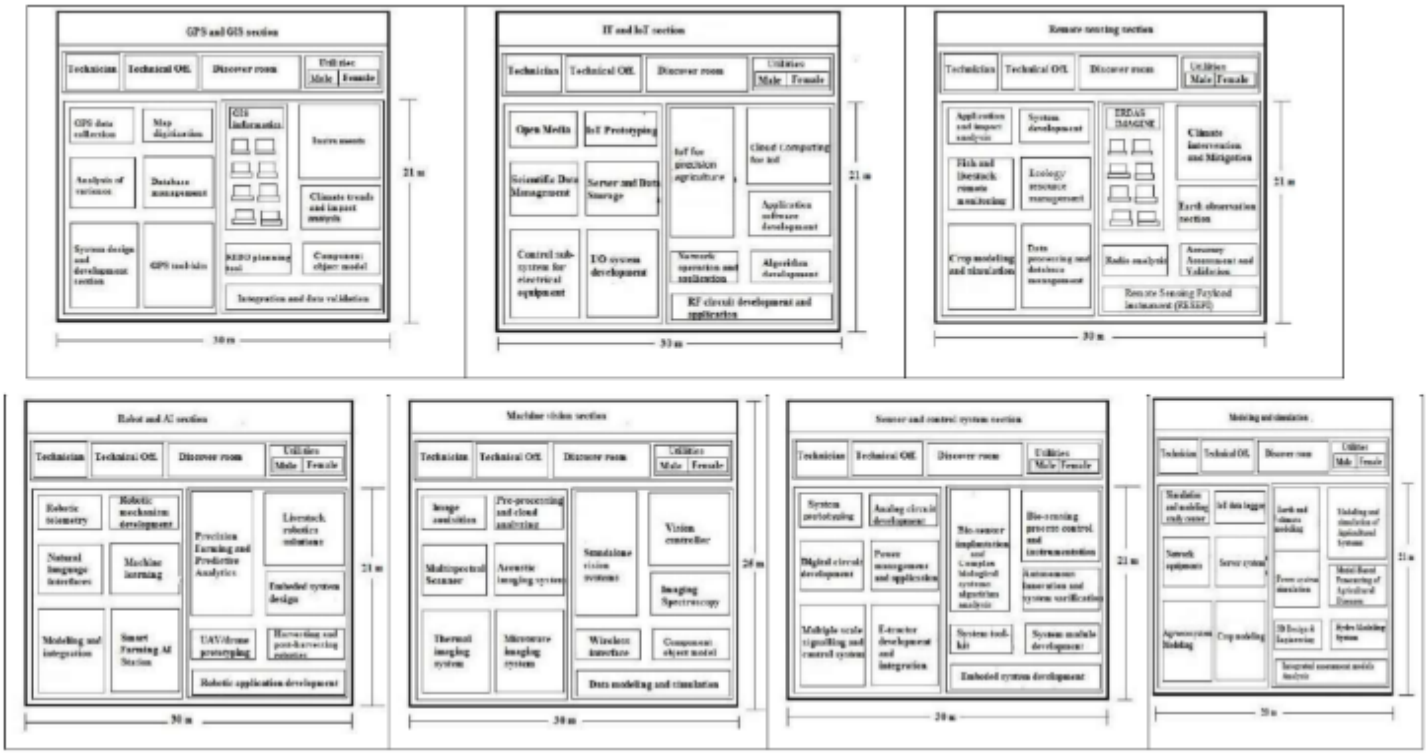
7. Brief description: The purpose of this laboratory is to conduct research using GIS, GPS, remote sensing, sensors, drones, robotics & AI, IT & internet of things (IoT) for ensuring profitable and sustainable farming system. Under this laboratory a field laboratory complex will be used to conduct controlled experiments related to precision agriculture. This complex will be located outside the main laboratory building.

Proposed sections:



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Proposed conceptual layout of the Climate-Smart Precision Agriculture and Modeling Lab (from the user perspective):



Note: *All of the 7 modules cannot be accommodated on a single floor. Need additional space.*

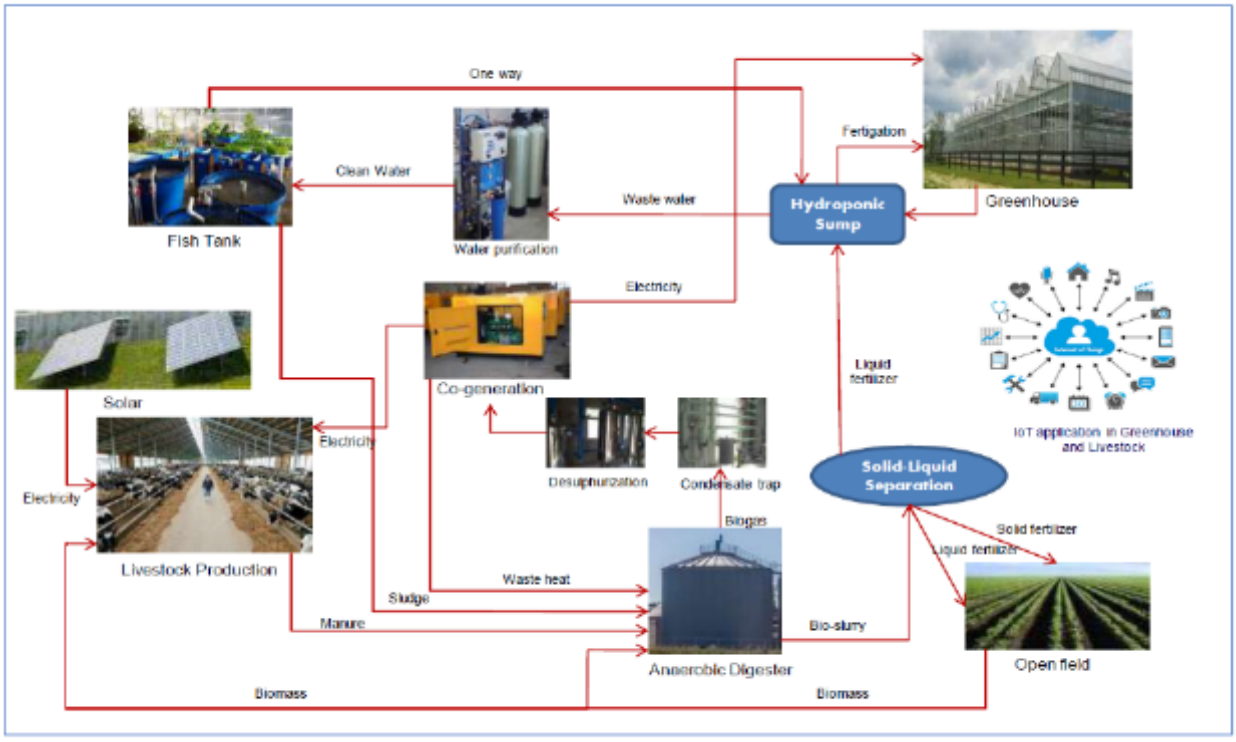
8. Special requirements: No special requirements except HVAC, dust-free clean environment and secured entry.

(iii) Precision Agriculture Field Laboratory

9. Purpose: The field laboratory complex will be used to conduct controlled experiments related to precision agriculture. This complex will be located outside the main laboratory building.

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Preliminary concept:



Note: *Detailed conceptual layouts and user requirements are yet to be developed.*

(iv) Analytical Laboratory

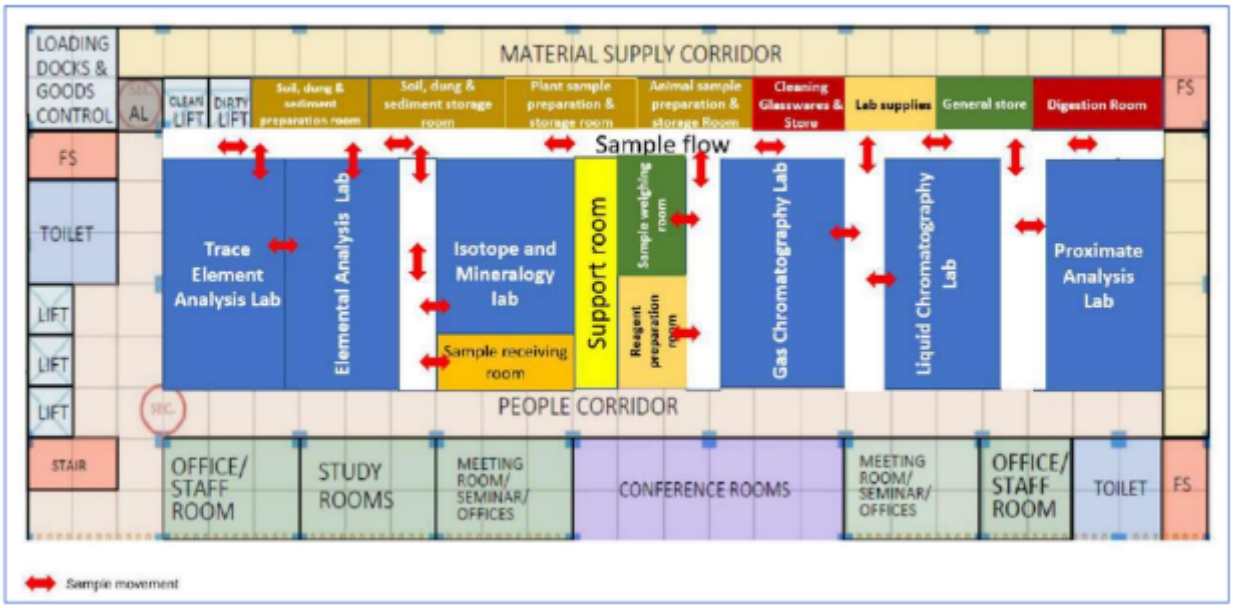
10. Purpose: Chemical analysis of soil, water, crop, biological samples, food & feed for heavy metals, trace elements, nutrients, biomolecules, metabolites, dissolved gas, etc.

11. Brief description: The analytical laboratory will have seven major sections along with sample receiving and storage and support areas as well as general office areas. The major sections are trace element analysis section, isotope and mineralogy laboratory, liquid chromatography laboratory, gas chromatography laboratory, proximate analysis laboratory, growth chambers and incubators, and air and water quality analysis laboratory. Chemical analysis of soil, water, crop, biological samples, food & feed for heavy metals, trace elements, nutrients, biomolecules, metabolites, dissolved gas, etc.

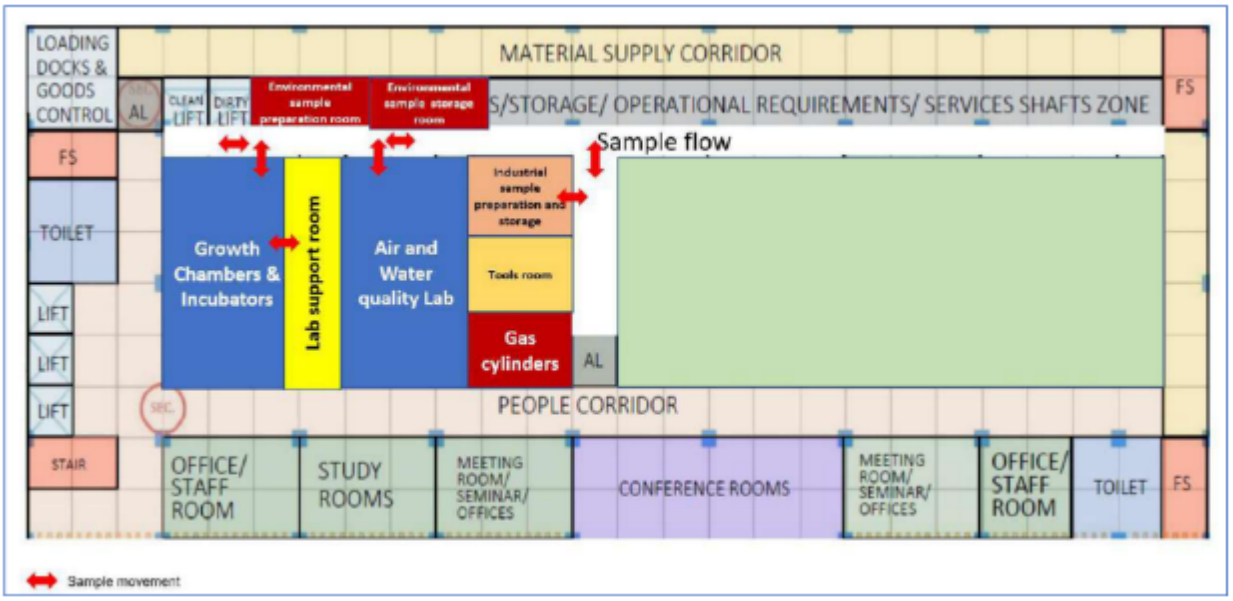
12. Special requirements: Secured entry, standard safety requirements of a chemical lab including efficient fume exhaust and HVAC.

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Part -1



Part 2



Note: *All the laboratory sections shown in part 1 and Part 2 cannot be accommodated on a single floor; need additional spaces.*

(v) Post-Harvest Technology and Food Processing Laboratory

13. Purpose:

- Developing innovative methods for handling, pre-processing and storage of agro-produces to minimize losses
- Designing, formulating and manufacturing nutritious and safe products and ingredients from agro-produces (plant, fish and livestock) and wastes
- Developing post-harvest and food processing equipment, tools and analytical methods

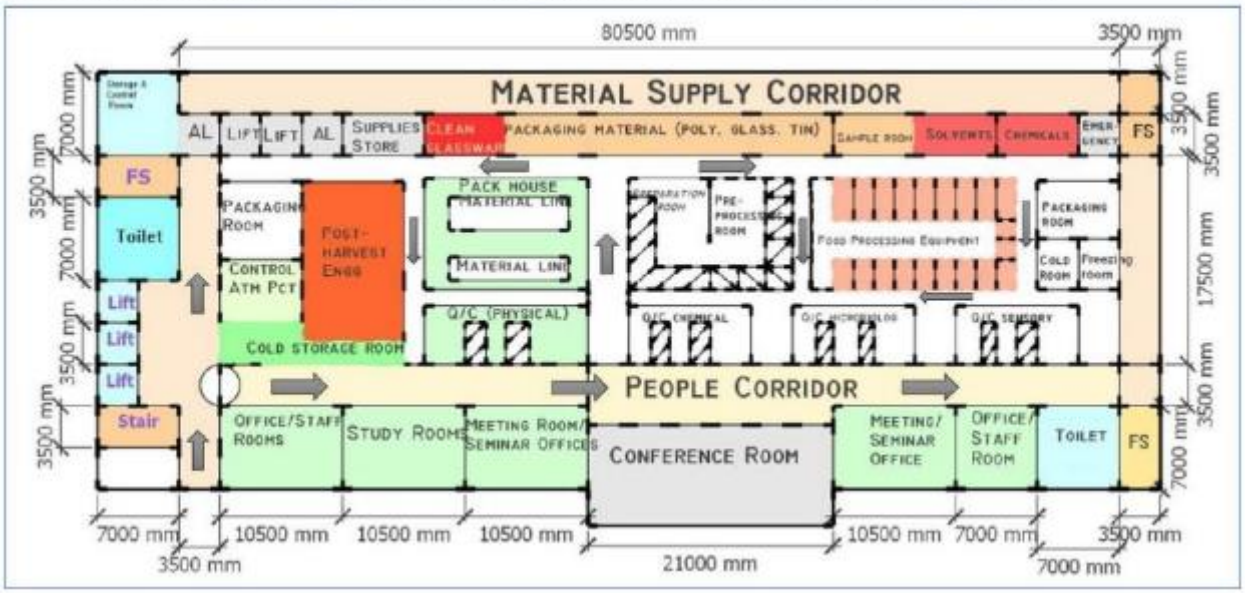
14. Brief description: The laboratory will be broadly divided into two main sections: the post-harvest technology section, and the food processing section. Each section will have different processing areas as well as quality control analysis laboratories. The purposes of this

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laboratory are for developing innovative methods for handling, pre-processing, and storage of agro-produces to minimize losses designing, formulating, and manufacturing nutritious and safe products and ingredients from agro-produces (plant, fish, and livestock) and wastes developing post-harvest and food processing equipment, tools, and analytical methods.

15. Special requirements: No special requirements except secured entry and HVAC.

Proposed conceptual layout of the post-harvest technology and food processing lab (from the user perspective):



(vi) Food Safety Laboratory

16. Purpose: Development of tools and techniques as well as providing quality assured services to the clients for the detection of biological, physical and chemical contaminants, residues, impurities, adulterants in food items, such as foodborne pathogens and or toxins, antimicrobial resistance patterns of the foodborne pathogens, antimicrobial residues, pesticide residues, hormones and growth regulators, and physical and chemical contaminants, impurities or adulterants.

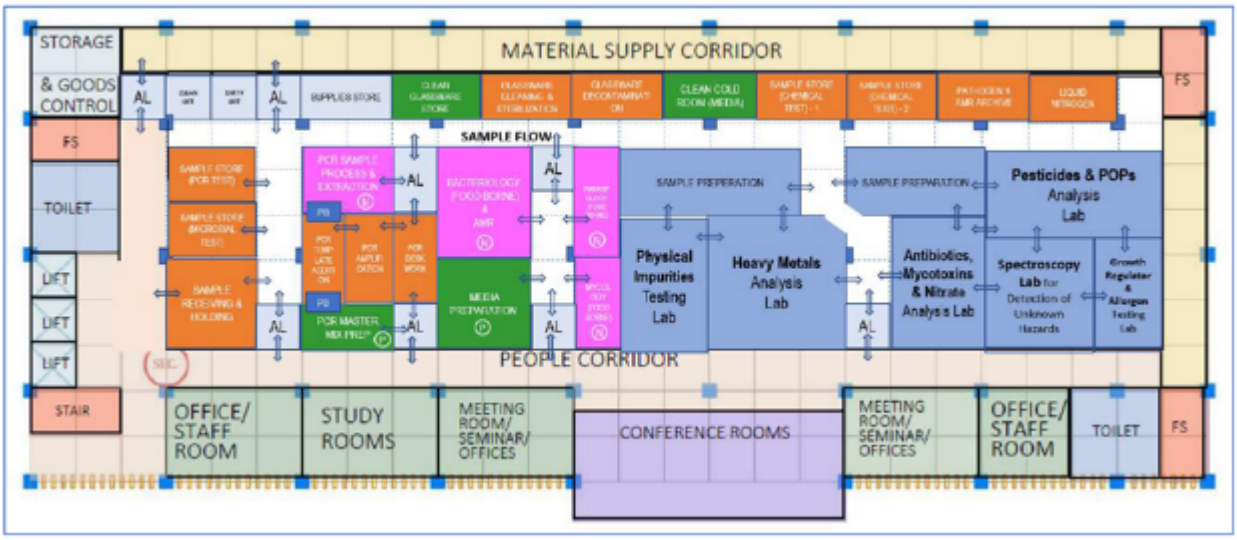
17. Brief description: The laboratory will have three broad sections, namely the polymerase chain reaction (PCR) section, the microbiology section, and the physical and chemical analysis section in addition to sample receiving, storage, other support areas and general office areas.

18. Special requirements:

- The PCR section, microbiology section and the physical and chemical analysis section will have different requirements in terms of biosafety, workflow, personnel flow, and airflow.
- The sample receiving and sample storage, PCR laboratory and microbiology (bacteriology, parasitology, and mycology) laboratory areas will be at biosafety level (BSL) 2 status with airlock entry and exit. Within this area, the PCR sample preparation and extraction room, bacteriology laboratory, parasitology laboratory and mycology laboratory will be under negative pressure, while the PCR master mix preparation room and media preparation room will be clean rooms under positive pressure.
- The physical and chemical analysis section does not have any biosafety requirements from a biological agent point of view but will comply with standard safety requirements of a chemical laboratory with efficient fume exhaust.

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Proposed conceptual layout of the food safety lab (from the user perspective):



(vii) Genomics & Bioinformatics Laboratory

19. Purpose: Developing new tools and techniques and proving services for advanced genomic analysis including next-generation sequencing, genome-wide genotyping, molecular diagnosis of genetic disorders, synthesis of oligos, primers and probes and in-silico data analysis.

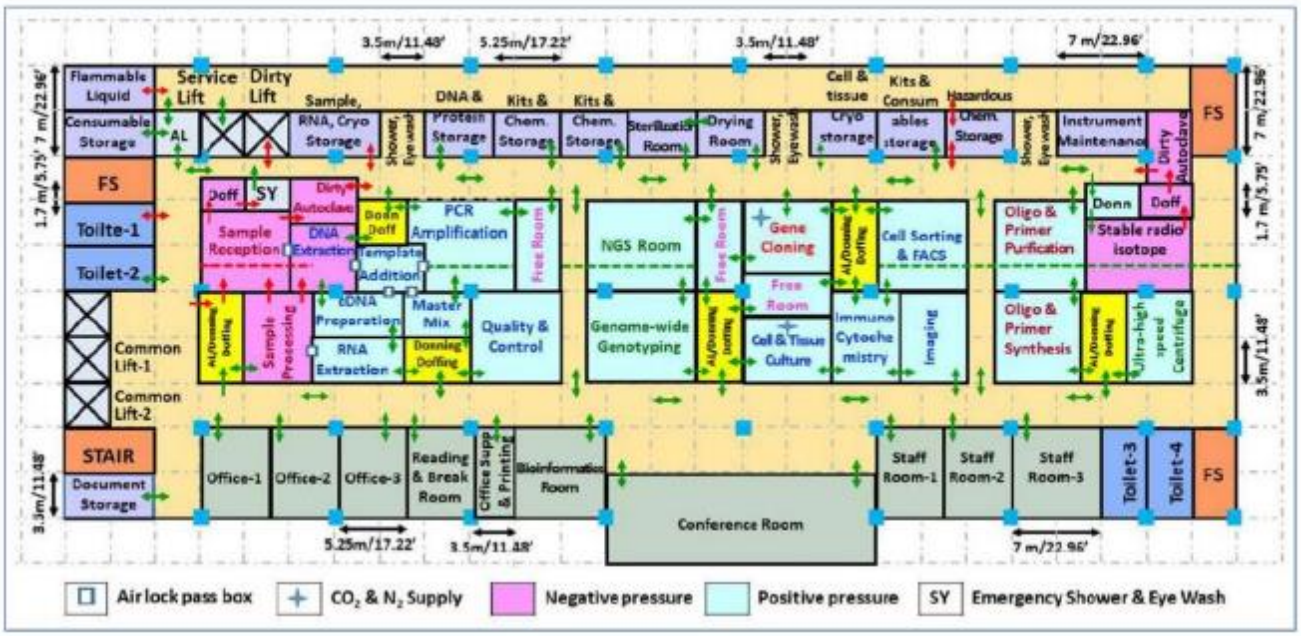
20. Brief description: The laboratory will have four major sections, namely PCR amplification, sequencing, cell biology, and oligo/primer/probe synthesis & radioisotope labeling section. All emergency safety devices will have to be installed. Developing new tools and techniques and proving services for advanced genomic analysis including next-generation sequencing, genome-wide genotyping, molecular diagnosis of genetic disorders, synthesis of oligos, primers and probes and in-silico data analysis.

21. Special requirements:

- The whole laboratory will be under BSL-2 standard.
- Sample receiving & primary sample processing room and the radioisotope labeling room will be under negative pressure and other labs will be under positive pressure.

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Proposed conceptual layout of the genomics & bioinformatics lab (from the user perspective):



(viii) Diagnostics and Vaccines Laboratory

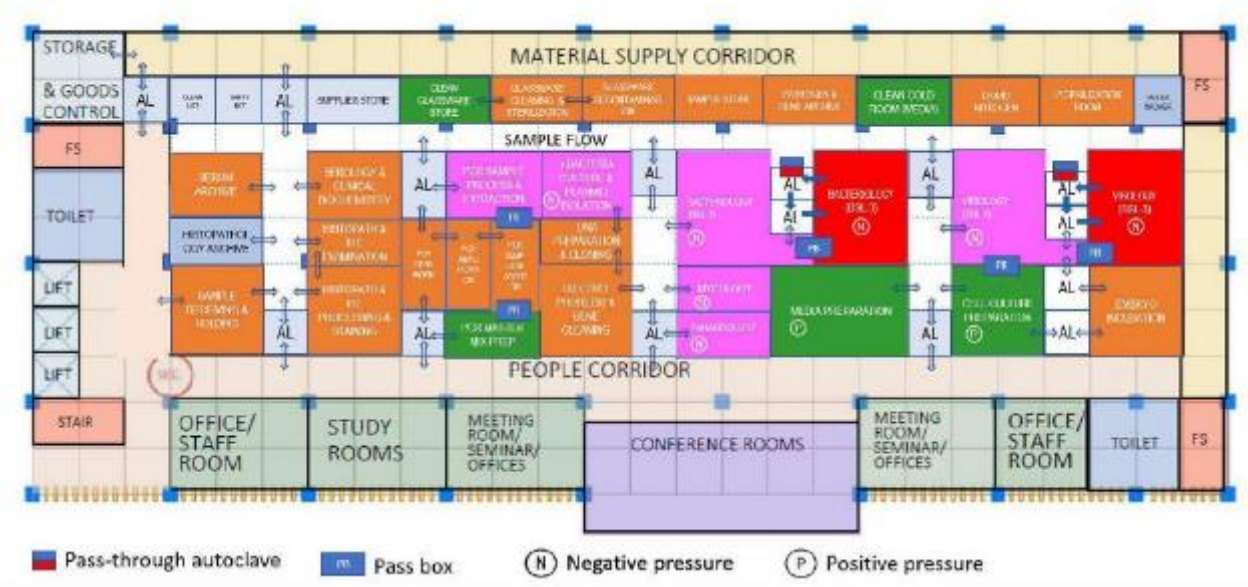
22. Purpose: Developing new diagnostic tools for animal, fish and plant diseases, developing new generation vaccines against animal and fish diseases, and providing diagnostic services to the clients.

23. Brief description: Developing new diagnostic tools for animal, fish, and plant diseases, developing new generation vaccines against animal and fish diseases, and providing diagnostic services to the clients. The laboratory will have four major sections in addition to the common sample receiving room, storage and archives, support areas and general office areas. The laboratory sections are (1) histopathology, immunohistochemistry, serology & clinical biochemistry section, (2) PCR & gene laboratory section, (3) bacteriology, mycology and parasitology section, and (4) virology section.

24. Special requirements: In general, the whole laboratory will be in BSL-2 containment. However, both Bacteriology and Virology labs will have one BSL-3 room accessible through the BSL-2 lab. The PCR sample processing and extraction room, Bacteriology lab (both BSL-2 and BSL-3), Mycology Lab, Parasitology Lab and Virology Lab (both BSL-2 and BSL-3) will be under negative pressure, while PCR Master mix preparation room, Media preparation room and Cell culture preparation room will be cleanrooms under positive pressure.

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Proposed conceptual layout of the diagnostics and vaccines lab (from the user perspective):



(ix) Animal Experimentation Facility

25. Purpose: The proposed animal experimentation facility will be at a separate location. This facility will be primarily for animal trials of newly developed vaccines. However, the food safety laboratory and genomics laboratory also might need to use this facility for any experiments using laboratory animals. In addition, other laboratories of the University also may use this facility on requisition.

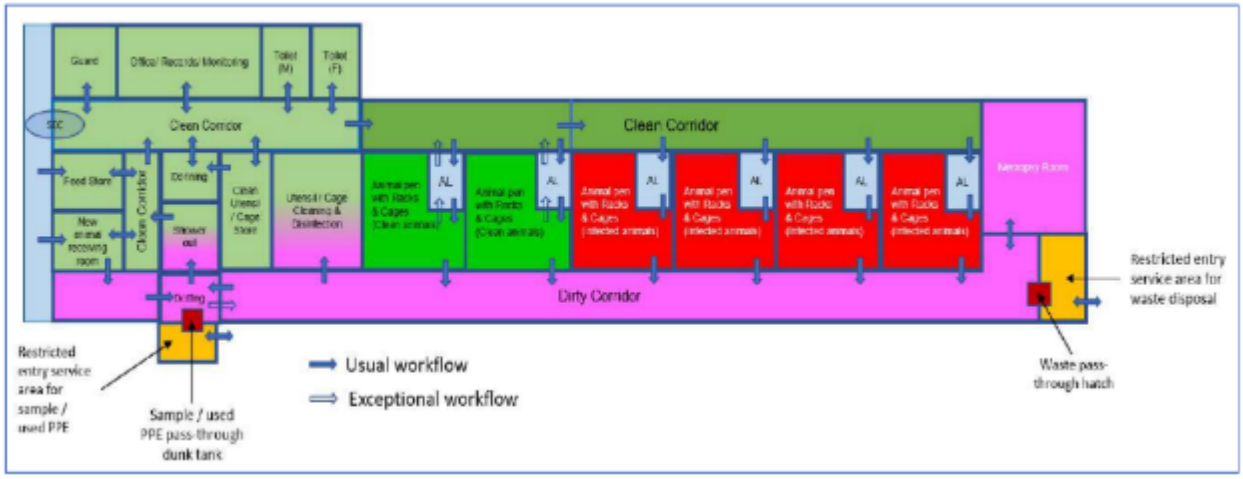
26. Brief description: There will be two identical units, one for poultry and another for laboratory animals. The layout of a single unit is shown below. They may be built either as twin-unit side by side or as two floors of a single building. In the case of the latter, there should be a stair/lift on the clean side and a mechanical waste transport system on the dirty side. In addition to strategically placed support service rooms and office, there will be six animal pens in each unit containing racks or cages, with airlock entry from the clean corridor and exit to the dirty corridor. There will also be a necropsy room on the dirty side. In addition, there shall be safe waste disposal facilities.

27. Special requirements:

- The animal experimentation facility will be at ABSL 2+ containment level with HVAC.
- Animal pens will be under pressure differential, with options to set at positive or negative pressure depending on the status of the animals (clean or infected).
- The facility will have proper waste disposal/treatment facilities.

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Conceptual layout of the animal experimentation facility (from the user perspective):



(x) Centralized Common Support Facilities

28. BICAR will have the following centralized facilities to support all the laboratories:

- Electricity generator and sub-station
- Server room
- Distilled and deionized water preparation and distribution
- Most used laboratory gas generation/storage and distribution
- Liquid nitrogen generation/storage
- Dry ice making
- Incinerator for laboratory waste
- Effluent treatment plant for liquid laboratory waste
- Security and intercom
- Instrument repairing workshop

29. **HCDI and IIFS**



30. The building will be used as institutes' laboratories, seminar rooms, working space and conference hall, classrooms, library, teachers and staff room of each institute, information booth, parking and information area.

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

(xi) Program Distribution

31. The six storied building is functionally divided horizontally to accommodate the following:

- Ground Floor: Common Reception point and waiting lounge.
- First Floor: Classrooms for Haor & Char Institute, common amenities such as students‘ common room and services.
- Second Floor: Labs for Haor & Char Institute, common amenities such as students‘ common room and services, training rooms, IT laboratory
- Third Floor: Classrooms for IIFS, common amenities such as students‘ common room and services
- Fourth Floor: Labs for IIFS, common amenities such as students‘ common room and services, training rooms, IT laboratory
- Fifth Floor: Faculty floor, department office, conference room and relevant common amenities

Floor	Programme	Functions	Dimension	Capacity	Area (sq. foot) [sq. m.]
Ground	Fab Lab	Working space	40' x 36'6"		45,938.95 [4,271.85]
		Working space	65' x 36'6"		
		3D Printing	40' x 36'6"		
		FabLAB museum	40' x 36'6"		
		3D Printing	40' x 36'6"		
		CNC Mill with store	40' x 36'6"		
		Laser cutter 1	40' x 36'6"		
		Laser cutter 2	40' x 36'6"		
		Souvenir Department	40' x 36'6"		
		Director's room	28' 8" X 12'4"		
		Reception	34' 6" X 36' 6"		
		Classroom (Fabrication Department)	40' x 36'6"	60 students	
		Office	14'0" X11'6"		
		Manager’s room	14'2" X 11'6"		
		Meeting room	28' 8" X 12'4"		
		3 Nos. Male washroom, 3 Nos. Female washroom			
		Advanced Electronics	37' 3" X 20"		
		Lift lobby	24' 8" X 16' 7"		
1st	Haor & Char Institute	Classroom 1	40' x 36'6"	60 students	41,527.11 [3,862.02]
		Classroom 2	40' x 36'6"	60 students	
		Classroom 3	40' x 36'6"	60 students	
		Classroom 4	40' x 36'6"	60 students	
		Classroom 5	40' x 36'6"	60 students	
		Classroom 6	40' x 36'6"	60 students	
		Classroom 7	40' x 36'6"	60 students	
		Classroom 8	40' x 36'6"	60 students	
		Library	50' x 36'6"		
		Laboratory-1	40' x 36'		
		Laboratory-2	40' x 36'		
		Training room	36' x 61'	121 persons	
		IT room	38'0" x 36'0"		
		Common room	24' 8" x 27 '9"		
		3 Nos. Male washroom, 3 Nos. Female washroom			

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Floor	Programme	Functions	Dimension	Capacity	Area (sq. foot) [sq. m.]
2nd	Haor & Char Institute	Laboratory-3	40' x 36'6"		39,333.9 [3,658.05]
		Laboratory-4	40' x 36'6"		
		Laboratory-5	40' x 36'6"		
		Laboratory-6	40' x 36'6"		
		Laboratory-7	50' 0" X 36' 6"		
		Laboratory-8	40' x 36'6"		
		Laboratory-9	40' x 36'6"		
		Laboratory-10	40' x 36'6"		
		Laboratory-11	40' x 36'6"		
		Laboratory-12	38'0" x 36'0"		
		Laboratory-13	40' x 36'		
		Laboratory-14	40' x 36'		
		Training room	36' x 61'	121 persons	
		Common room	24' 8" x 27 '9"		
		3 Nos. Male washroom, 3 Nos. Female washroom			
3rd	IIFS	Classroom 9	40' x 36'6"	60 students	42,253.8 [3,929.6]
		Classroom 10	40' x 36'6"	60 students	
		Classroom 11	40' x 36'6"	60 students	
		Classroom 12	40' x 36'6"	60 students	
		Classroom 13	40' x 36'6"	60 students	
		Classroom 14	40' x 36'6"	60 students	
		Classroom 15	40' x 36'6"	60 students	
		Classroom 16	40' x 36'6"	60 students	
		Laboratory - 15	50' x 36'6"		
		Laboratory -16	40' x 36'		
		Laboratory -17	40' x 36'		
		Training room	36' x 61'	121 people	
		IT room	38'0" x 36'0"		
		Common room	24' 8" x 27 '9"		
		3 Nos. Male washroom, 3 Nos. Female washroom			
4th	IIFS	Laboratory-18	40' x 36'6"		41,081.1 [3,820.54]
		Laboratory-19	40' x 36'6"		
		Laboratory-20	40' x 36'6"		
		Laboratory-21	40' x 36'6"		
		Laboratory-22	50' 0" X 36' 6"		
		Laboratory-23	40' x 36'6"		
		Laboratory-24	40' x 36'6"		
		Laboratory-25	40' x 36'6"		
		Laboratory-26	40' x 36'6"		
		Laboratory-27	38'0" x 36'0"		
		Common room	24' 8" x 27 '9"		
		Director's room	25'6" x 22'6"		
		Secretary's room	12'0" x 22'6"		
		Associate Director (Haor and Char Department)	29"x16'		
		Staff room	37'9" x 14'		
		Floor attendants	10'x23'		
		Retiring room	15' x 16'		
		Tea room	16'X10'		
		3 Nos. Male washroom, 3 Nos. Female washroom			

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Floor	Programme	Functions	Dimension	Capacity	Area (sq. foot) [sq. m.]
		Officer's room	38'0" x 36'0"		
		Meeting/Conference	36' x 61'		
5th	Haor & Char Institute, IIFS	5 Nos. Faculty room of teachers of Haor & Char	15'6"X 11'6"		45562.95 [4237.35]
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of Haor & Char	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of Haor & Char	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of Haor & Char	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		3 Nos. Faculty room of Professor of Haor & Char	15'6"X 11'6"		
		3 Nos. Faculty room of PhD Fellow of Haor & Char	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of IIFS	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of IIFS	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of IIFS	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		5 Nos. Faculty room of teachers of IIFS	15'6"X 11'6"		
		Waiting room	23' 6"X 11'6"		
		3 Nos. Faculty room of professor of IIFS	15'6"X 11'6"		
		3 Nos. Faculty room of PhD fellow of IIFS	23' 6"X 11'6"		
		Director's room	25'6" x 22'6"		
		Secretary's room	12'0" x 22'6"		
		Associate Director (Haor & Char)	29"x16'		
		Staff room	37'9" x 14'		
		Floor attendants	10'x23'		
		Retiring room	15' x 16'		
		Tea room	16'X10'		
		Officer's room	38'0" x 36'0"		
		3 Nos. Male washroom, 3 Nos. Female washroom			
		Meeting/Conference	36' x 61'		

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Appendix 2

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

APPENDIX 3

Inspection/Audit of Existing Buildings
Output 1 – Renovation and Refurbishment

Name of Faculty/Department/Institute	Faculty of Agricultural Economics and Rural Development- Faculty and Dean Building
Building No. in Map	01
Name and Designation of Contact Person	Prof. Dr. K.M. Mustafiur Rahman
Date of Inspection/Audit	11.03.2024
Location of the Building (geographical coordinates)	24°43'34"N 90°26'14"E
Age of the Building (i.e., year it was first used)	Built in 1994
Approximate Number of Building Users/Occupants	Around 680
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor-** Gallery classroom, regular classroom, labs, toilets **1st Floor-** labs, computer labs, classroom, library, toilets Opposite side of the building is designated for the teachers only.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Improvement of classrooms 2) New furniture 2) Designated rooms for teachers 3) Good quality light 4) Better toilet 5) Modern lighting system and sound system for gallery

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			1) Price lab 2) Economics lab 3) Statistic lab
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?	√			
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		

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Items	Yes	No	NA	Remarks
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Paper waste mostly
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Dean
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are there toilets in the building? *Please indicate in the Remarks the number of toilets)*	√			Total 12 toilets, 1Teacher, 3Male, 2Female total 6 toilets in each floor
Are the toilets in good condition?		√		Poor condition
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate? *Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a "no smoking" policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?		√		
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Weak
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?		√		
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Animal Husbandry (Main building)
Building No. in Map	02
Name and Designation of Contact Person	Prof. Dr. Momota Rani Debi
Date of Inspection/Audit	11.03.2024
Location of the Building (geographical coordinates)	24°43'35"N 90°26'10"E
Age of the Building (i.e., year it was first used)	Built in 11.04.1994
Approximate Number of Building Users/Occupants	Around 700
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor-** Gallery classroom, regular classroom, labs, Animal breeding lab, Gradick lab, dairy chemistry lab, toilets. **1st floor-** Animal nutrition lab, office block, classroom, library, animal science lab, Dairy Microbiology lab, renewable energy lab Opposite side of the blocks are only for teachers.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Better furniture 2) Classroom renovation 3) Floor material change 4) Better lighting

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			
If there is biosafety laboratory, what is the biosafety level?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there an overall coordinator who manages the laboratories in the building?	√			Department head/ Dean
Solid Waste Management				
Is there a waste collection in the building?		√		
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Laboratory wastes, Papers
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?	√			
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			2 Teacher, 3Male, 3 Female total 6 toilets in each floor
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		More than 250 fans but still not adequate for summer season.
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Not adequate
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?	√			Not adequate
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Gymnasium, Bangladesh Agricultural University,
Building No. on Map	03
Name and Designation of Contact Person	Md. Shahfasi-Ullah, Deputy Director
Date of Inspection/Audit	10.03.2024
Location of the Building (geographical coordinates)	24°43'14.8"N90°26'05.5"E
Age of the Building (i.e., year it was first used)	Age 40 years, built in 1984, started using from 1988
Approximate Number of Building Users/Occupants	During program- around 500, regular time- around 250
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground floor-** Main hall, deputy director room, room of director, deputy director and register room, assistants' room, store room stuff room, store keeper, deputy register room, deputy director female room, teacher's office, toilets, student's gym room, teacher's gym room etc.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Better indoor lights specially for sport purpose 2) better air ventilation system 3) Gallery area for the audience 4) Renovating water fountain 5) Damp treatment 6) Better waste management area 7) Well painted walls

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?		√		
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?				
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*				Paper waste, food waste, shuttle corks, banners, posters etc.
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Deputy director
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water pump system
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			4 Male, 4 Female total Total 8 toilets
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		Suffocating, insufficient fans, dysfunctional exhaust fans
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			Poor ventilation system
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Low manpower, low security system
Transportation				

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are bicycle racks and/or parking available in the building for students, faculty and staff?		√		Scattered vehicle parking, insufficient car parking area
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Dean Building/ Kazi Fazlur Rahman Bhaban
Building No. on Mao	04
Name and Designation of Contact Person	Prof. Dr. Shajeda Akhter, Dean of Faculty of Animal Husbandry
Date of Inspection/Audit	11.03.2024
Location of the Building (geographical coordinates)	24°43'33.9"N 90°26'12.0"E
Age of the Building (i.e., year it was first used)	Built in 11.04.1994
Approximate Number of Building Users/Occupants	Around 400
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground floor**- Classroom, teachers' room, toilet Animal gen and breeding lab, toilet store room **1st room-** Conference room, Dean room, register room, Deputy register room, Stuff room, Snack corner, Store room, Toilet **2nd floor-** Classroom, Reproductive biotech lab, Post grad lab, Prayer room, Toilet

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	3rd floor- Teachers room, Classroom
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) New furniture layout 2) Better air circulation is needed 3) Top floor renovation

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			2 labs
If there is biosafety laboratory, what is the biosafety level?	√			Ground floor- Animal research (level-1)
Is there an overall coordinator who manages the laboratories in the building?	√			3rd floor- Yahiha Khandaker Ground floor- Prof. Dr. Monir Hossein
Solid Waste Management				
Is there a waste collection in the building?	√			
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Paper waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?	√			
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there a coordinator (or designated staff) for emergency?	√			Dean Sir/Madam
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			5 nos
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency stairs
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible pump, electric filter (4)
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			GF- 4nos, 1st- -3nos, 2nd-2nos, 3rd-2nos
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		40 fans not enough sufficient
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		

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Items	Yes	No	NA	Remarks
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Cycle-200, bike- 60, stuff- 10
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			From health center
Is there grounds waste composting?	√			Not much
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Library, Bangladesh Agricultural University
Building No. on Map	05
Name and Designation of Contact Person	Md Khairul Alam (Nannu), Librarian (In-Charge)
Date of Inspection/Audit	10.03.2024
Location of the Building (geographical coordinates)	24°43'28"N 90°26'17"E
Age of the Building (i.e., year it was first used)	63 Years (Built-1963)
Approximate Number of Building Users/Occupants	Near above 300

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor**- Reception, Public Library, Liberation literature corner, career corner (in progress), 2 Deputy librarian office, Additional librarian office, Book stack area (Restricted), Toilets ICT cell and server room (not related to the library) **1st Floor**- Reading room, Thesis book archive room, Reserve room, photocopy area, water filter zone, multiple store room (used to be carrel room), Academic text book rental library, cyber center, toilets and a blank room **2nd floor**- Server control room, virtual classroom, Central innovation hub, Old archive room, Binding room, 2 Audio and video room, multiple stuff room, archive room, computer lab, prayer room, store room, snack area, 2 procurement duty librarian office, office room, librarian room, 2 book processing room and toilets.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Poor Structural condition 2) Drainage Problem in ground floor 3) Floor Damped in several places 4) Insufficient space in reception for bags 5) Need locker space for students 6) New furniture is needed for the library 7) False ceiling renovation 8) e-book zone 9) e-journal zone 10) Air Conditioning 11) Better Learning Environment

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			
If there is biosafety laboratory, what is the biosafety level?			√	
Is there an overall coordinator who manages the laboratories in the building?			√	
Solid Waste Management				
Is there a waste collection in the building?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*			√	Mainly paper waste, few food waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Librarian (in-charge)
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?	√			Not available
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			Expired fire-extinguisher, they have insurance with “Jibon Bima” Corporation
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water and filters

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?	√			In every three months
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 30 no's
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			But air conditioning will be more helpful during summer
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a "no smoking" policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?		√		
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?		√		
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		

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Items	Yes	No	NA	Remarks
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Veterinary Science- Building 1
Building No. on Map	06
Name and Designation of Contact Person	Dr. Munmun Parvin
Date of Inspection/Audit	19.03.2024
Location of the Building (geographical coordinates)	24°43'28"N 90°26'14"E
Age of the Building (i.e., year it was first used)	Built in 1961
Approximate Number of Building Users/Occupants	Around 600+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground floor- Department of Microbiology and Hygiene**- Gallery classroom, Bacteriology labs, virology labs, Molecular labs, food hygiene health lab, head room, teachers' room, storeroom toilets **1st floor- Department of Pathology-** gallery classroom, conference room, Histopathology lab, Necropsy room, Systemic Pathology room, general classroom, teachers' room, head room, isolated PhD lab, storeroom, toilets, kitchen **2nd floor- Department of Parasitology-** Teachers room, Cell and Tissue culture lab, Proctology lab, Pro. Seikh Hafizuddin Lab, Helminthology and Malacology lab, Diagnostic Parasitology Lab, PhD room, MSc Classroom etc.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation 2) Better ventilation system 3) Common toilet renovation 4) Damp treatment

Items	Yes	No	NA	Remarks
Laboratory Facilities				

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			Total 20+ labs including research and academic. 2 labs – biosafety level 2 1 lab- biosafety level 1
If there is biosafety laboratory, what is the biosafety level?	√			3 labs (BSI)
Is there an overall coordinator who manages the laboratories in the building?	√			Designated teachers with assigned students
Solid Waste Management				
Is there a waste collection in the building?	√			Incinerator, pits
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?	√			Chemical waste segregation, (infectious agents)
Is there a waste reduction program and/or recycling in the building?		√		Only labs
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few food waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		

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Items	Yes	No	NA	Remarks
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Filter
Are all the sources of drinking water in good condition?	√			Submersible water system
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 6 toilets, (1Female , 2Male , 4Common) in each floor
Are the toilets in good condition?	√			Average
Are first-aid kits available in the building?	√			
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			High temperature and high humidity during summer.
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*		√		
Transportation				

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Items	Yes	No	NA	Remarks
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			No designated car parking area
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?	√			Inactive
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Veterinary Science- Building 2
Building No on Map	07
Name and Designation of Contact Person	Prof. Dr. Md. Abdul Awal, Dean of department of Anatomy and Histology
Date of Inspection/Audit	14.03.2024
Location of the Building (geographical coordinates)	24°43'29.6"N 90°26'13.6"E
Age of the Building (i.e., year it was first used)	Built in 1961
Approximate Number of Building Users/Occupants	Around 700+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Anatomy and Histology-** Histology gallery, Anatomy Gallery, Histology lab, Applied Anatomy lab, Anatomy lab, Molecular lab, Postgraduate lab, Teachers room, store room, stuff room, office room toilets **1st Floor- Department of Physiology & Pharmacology-** Physiology Gallery, Pharmacology Gallery, Physiology lab, Hematology lab, Toxicology lab, Pharmacology lab, teachers' room, stuff room, toilets.

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

	2nd Floor- Department of Pharmacology- Post grad labs, teachers' room, conference room, stuff room, toilet
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Wall damp reduction 2) Better ventilation 3) New floor tiles 4) New furniture 5) Better plumbing system 6) Classroom Renovation

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			Academic lab and research-based lab Histology lab, Applied Anatomy lab, Anatomy lab, Molecular lab, Postgraduate lab, Physiology lab, Hematology lab, Toxicology lab, Pharmacology lab
If there is biosafety laboratory, what is the biosafety level?		√		7 labs- biosafety level-1 1 lab- biosafety level- 2
Is there an overall coordinator who manages the laboratories in the building?		√		Personal lab not counted
Solid Waste Management				
Is there a waste collection in the building?	√			No designated person
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few food waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				

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Items	Yes	No	NA	Remarks
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Dean Sir, head of the department
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			Expired
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water system and filter
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 8, in each floor for teachers and common
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		120 fans but not adequate for the galleries

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Items	Yes	No	NA	Remarks
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Insufficient
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Veterinary Science- Building 3
Building No. on Map	08

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Name and Designation of Contact Person	Prof. Dr. Md. Tanvir Rahman
Date of Inspection/Audit	14/03/2024
Location of the Building (geographical coordinates)	24°43'31"N 90°26'13"E
Age of the Building (i.e., year it was first used)	Built in 1960
Approximate Number of Building Users/Occupants	Around 700
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Surgery & Obstetrics-** Bio-tech lab, CVDF lab, Phantom Hall, O.Y. Lab, Reproduction lab, Blood bank, teachers' room, classroom, stuff room, toilets **1st Floor- Department of Medicine-** Medicine gallery, Bacteriological lab, Masters class room, Zoonotic Disease lab, PCR lab, teachers' room, toilets **2nd Floor- Department of Medicine-** Faculty Library, Laboratories, Library store, teachers' room, toilets.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation 2) Modern furniture 3) Toilet- sunlight cover 4) Better ventilation 5) window, sunshades renovation

Items	**Yes**	**No**	**NA**	**Remarks**
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			
If there is biosafety laboratory, what is the biosafety level?	√			2 labs- Biosafety level-01 1 labs- Biosafety level-02
Is there an overall coordinator who manages the laboratories in the building?	√			Head of the Department
Solid Waste Management				
Is there a waste collection in the building?	√			Building stuffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few food waste, chemical waste

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Dean
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			3 fire extinguishers
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 9 toilets, 1Male, 1Teachers and 1Female in each floor
Are the toilets in good condition?	√			
Are first-aid kits available in the building?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a "no smoking" policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?		√		
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			25 cycle and bike parking, insufficient car parking
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Agriculture Engineering and Technology- Dean Building
Building No. on Map	09
Name and Designation of Contact Person	Prof Dr. Md. Zainal Abedin-Dean
Date of Inspection/Audit	14/03/2024
Location of the Building (geographical coordinates)	24°43'27"N 90°26'07"E
Age of the Building (i.e., year it was first used)	Built in 2003
Approximate Number of Building Users/Occupants	Around 500
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor-** Gallery classroom, office room, dean room, teachers' room, toilet **1st Floor-** Teachers room, classroom, labs toilets **2nd Floor-** Classrooms, labs toilets **3rd Floor-** Classroom, Conference room, toilets
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation and Improvement 2) Window, Sunshades repair 2) Modern furniture implementation 3) Toilet renovation, Male, female segregation 4) Better lighting system

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			5 labs
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?	√			By building staffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Paper waste, mortar waste, plastic waste, old furniture chemical waste etc.
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit sign
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water pump and one electric filter
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?	√			

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Items	Yes	No	NA	Remarks
Are there toilets in the building? *Please indicate in the Remarks the number of toilets)*	√			Total 9 toilets, 1Teacher , 1Male and 1Female each floor
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate? *Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		Personal air condition, fans are not sufficient enough
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		Course related (Biosafety Department)
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Not very effective
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Insufficient parking
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Are pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				

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Items	Yes	No	NA	Remarks
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Agriculture Engineering and Technology- Faculty Building
Building No. Map	10
Name and Designation of Contact Person	Dr. Tapas Kumar Acharjee, Head of the Department
Date of Inspection/Audit	12/03/2024
Location of the Building (geographical coordinates)	24°43'27"N 90°26'09"E
Age of the Building (i.e., year it was first used)	Built in 1977
Approximate Number of Building Users/Occupants	Around 500
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor-** Gallery classroom, Environmental engineering room, Soil and water engineering lab, class room, M.S. classroom, Gallery room, stuff room, toilets **1st Floor-** Conference with MS classroom, computer lab, classrooms, hall room, toilets Other side of the building block is designated for the teachers.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Renovation and Improvement of classroom 2) Replacement of old electric wiring 2) Replacement of old water supply system for each room 3) Replacement of shutters by walls and windows 4) Painting of all room 5) Renovation of all Toilet/ washroom 6) New furniture for the laboratories

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			3 labs Hydraulic Laboratory Soil & water engineering Laboratory Field Irrigation Laboratory

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Items	Yes	No	NA	Remarks
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?	√			By building staffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Paper waste, mortar waste, plastic waste, old furniture, chemical waste etc.
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit

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Items	Yes	No	NA	Remarks
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water Pump and one electric filter
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?	√			
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 12 toilets
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		Personal air condition, fans are not sufficient enough
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		Course related (Biosafety Department)
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Not very effective
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Insufficient parking
Is transportation provided to students, faculty, and staff?	√			

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Items	Yes	No	NA	Remarks
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Department of Agriculture Extension Education (DAEE)
Building No. on Map	11
Name and Designation of Contact Person	Dr. Most. Zannatun Nahar Mukta
Date of Inspection/Audit	19/03/2024
Location of the Building (geographical coordinates)	24°43'19.6"N 90°26'11"E
Age of the Building (i.e., year it was first used)	Built in 1993 (31years)
Approximate Number of Building Users/Occupants	Approximately 150+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- BAUAC** 9 officer's room with office room, 1 washroom/toilet facilities **GTI-** 6 teachers' room, 2 office room, 2 classroom, 1 storeroom, 2 wash rooms/ toilet facilities. **1st Floor-** 7 teachers' room, 1 head room, 1 office room, 1 conference room, 1 library, 1 MS room, 1 undergraduate classroom, 3 washroom/toilet facilities. **2nd Floor-** 10 Teachers room, 3 classrooms, 3 teachers' room for GTI, 1 store room, 3 wash room/toilet facilities.
Brief description of the proposed scope of renovation/refurbishment	1) Classroom renovation and Improvement 2) Adequate Lighting

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(e.g., replacement of lighting system, separation of male/female toilet, etc.)	3) Construction of 3rd floor for accommodating all classes and examinations 4) Renovation of pillars in the roof top 5) False ceiling of the first and second floor 6) Renovation of writing and lighting system for corridors and classroom 7) Painting for whole building 8) Renovation of student's toilet

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?		√		Al least 2 well equipped virtual labs (facilitated with at least 20 computers in each lab) for both undergraduate and post graduate students for introducing and practicing presentation skills and preparing them for practicing data analysis in social science research
If there is biosafety laboratory, what is the biosafety level?			√	
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?		√		
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?	√			Small bins placed inside rooms and the corridor
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*				Mainly dry waste like papers, few food waste, chemical waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		

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Items	Yes	No	NA	Remarks
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Total number of drinking faucet is not known (Building was partially closed during audit)
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Not known (Building was partially closed during audit)
Are the toilets in good condition?	√			
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			Electric wires are not well managed

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Items	Yes	No	NA	Remarks
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?	√			Each individual room contains
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?		√		Some allergic health effects are noticed/complained due to “Akashmoni plants” floral parts and dusts from construction of drainage channel in roadside
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Not enough security officers in number and not enough trained in ensuring safety.
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Small parking area. No bicycle parking shade. Insufficient car parking.
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Agriculture Faculty- East Building

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Building No. on Map	12
Name and Designation of Contact Person	Prof. Dr. Md. Abdul Awal
Date of Inspection/Audit	14/03/2024
Location of the Building (geographical coordinates)	24°43' 24.24"N 90°26'14.28"E
Age of the Building (i.e., year it was first used)	After independence (1971)
Approximate Number of Building Users/Occupants	Around 700
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Soil Science-** M.S. office room, Soil morphology lab, office room, Soil testing lab, class room, Soil physic lab, Soil chemistry lab, Undergraduate lab, I.B lab, Soil Mycology lab, Instrument room, E.R. room, L.E.S. lab, Hombold room, teachers' room, office room, toilets **1st Floor- Department of Crop Botany-** Tissue Culture lab, Class rooms, Undergraduate labs, Plant Ecology lab, Plant Physiology lab, **2nd Floor- Department of Medicine-** Insect Biotechnology, Insect museum, MS Classroom, Laboratory of applied, Graduate laboratory, Ecofriendly Insect labs, IPM lab, Insect pest Control, Stored Product lab, toilets
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation (window, sunshades) 2) Modern furniture 3) Toilet, male female area segregation 4) Better ventilation in corridor

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			18 labs
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?	√			Mainly teachers
Solid Waste Management				
Is there a waste collection in the building?	√			Building staffs, city corporation
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		

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Items	Yes	No	NA	Remarks
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Crop waste, paper waste, chemical waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water Pump, water filter
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building? *Please indicate in the Remarks the number of toilets)*	√			1Teacher, 2Male, 2Female total 5 toilets in each floor

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Items	Yes	No	NA	Remarks
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		Corridor blocks the ventilation, around 500 fans
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			West side of the building is more suffocating and uncomfortable during summer
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*		√		
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Not adequate
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		

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Items	Yes	No	NA	Remarks
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Agriculture Faculty Building- West Building
Building No. on Map	13
Name and Designation of Contact Person	Prof. Dr. Md. Romij Uddin, Head of Department of Agronomy
Date of Inspection/Audit	19/03/2024
Location of the Building (geographical coordinates)	24°43'24"N 90°26'11"E
Age of the Building (i.e., year it was first used)	Built after independence (1971)
Approximate Number of Building Users/Occupants	Around 1000
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Agronomy-** Agronomy gallery, Agro Inno lab, weed lab, seed lab, oven room teachers' room, head room, multiple labs, toilets **1st Floor- Department of Horticulture-** Horticulture gallery, classrooms, Post Graduate lab, Under graduate labs, Fruit research lab, MS Classroom, teachers' room, office room, head room, toilets **2nd Floor- Department of Plant Pathology-** Plant Pathology gallery, Bio safety lab, Plant Disease and Diagnostic Clinic, Classrooms, Undergraduate labs, eco friendly labs, Molecular labs. B.B.B. lab, Microbiology lab, Plant Bacteriology lab, P.M.I. lab, Mycotoxin lab, teachers' room, Head room, toilets **3rd Floor-Dep. Of ENVS/Bio Technology/English Language-** Classroom, M.Metelogy lab, Under graduate lab, G.C. lab, Language lab, Biotech Classroom, ENVS Classroom, Language lab, Undergraduate classroom, Biotech lab, I.P.M. Lab, teachers room, toilet, stuff room.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation 2)Lighting Improvement 2) Wall damp control 3) Toilet renovation 4) Better treatment of top floor 6) Elevator needed

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Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			18 labs including academic and research labs
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		Head of the Department
Solid Waste Management				
Is there a waste collection in the building?		√		
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, plant waste, few food waste, chemical waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		Maybe outside the building
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?		√		
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		

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Items	Yes	No	NA	Remarks
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water pump and filters
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			1 Teacher, 2 Male, 2 Female total 5 toilets in each floor
Are the toilets in good condition?	√			Teachers toilet is in good condition, student’s toilet is not in good condition
Are first-aid kits available in the building?	√			
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?		√		
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			

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Items	Yes	No	NA	Remarks
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Sufficient bicycle parking but not enough car parking area
Is transportation provided to students, faculty, and staff?	√			For outdoor practical classes
If transportation is provided, is it free or a reasonable fee is charged?	√			Its free for the student for academic purpose
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Department of Agroforestry
Building No. on Map	14
Name and Designation of Contact Person	Prof. Dr. Md. Abdul Wadud, Head of Department of Agroforestry
Date of Inspection/Audit	19/03/2024
Location of the Building (geographical coordinates)	24°43'19.6"N 90°26'10.7"E
Age of the Building (i.e., year it was first used)	Early 20's
Approximate Number of Building Users/Occupants	Around 250+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Agroforestry-** Office room, teachers' room, Dean room, undergraduate lab, master's lab, M.S. Classroom, conference classroom, toilets **1st Floor- Department of Agrometeorology-** same as ground floor.

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Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) More classroom and Improvement of existing 2) More teachers room 3) Toilet renovation 4) Wall damp solution 5) Better ventilation system

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			4 labs
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?	√			Teachers for specific courses
Solid Waste Management				
Is there a waste collection in the building?	√			Building staffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?	√			Partially in academic courses
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Crop waste, soil waste, paper waste, food waste etc
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		

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Items	Yes	No	NA	Remarks
Is there a coordinator (or designated staff) for emergency?	√			Dean
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			1 Teacher, 2 Male, 2 Female total 5 toilets in each floor
Are the toilets in good condition?	√			Average
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		40 fans, personal air condition, corridor not well ventilated
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		

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Items	Yes	No	NA	Remarks
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			During summer its suffocating
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			Theft problem mostly
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Insufficient bicycle parking and no designated car parking
Is transportation provided to students, faculty, and staff?		√		
If transportation is provided, is it free or a reasonable fee is charged?		√		
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Are pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?	√			Sometimes
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Auditorium
Building No. on Map	15
Name and Designation of Contact Person	Md. Abdus Salam, Assistant Register- in charge
Date of Inspection/Audit	10/03/2024
Location of the Building (geographical coordinates)	24°43'27"N 90°26'20"E
Age of the Building (i.e., year it was first used)	Founded in 1972, inauguration 1988

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Approximate Number of Building Users/Occupants	Around 2500, seat number-2250
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	Main Auditorium, green room, stage, light control room, sound control room, office room, store room
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) False ceiling change 2) Seat change 3) Board partition change 4) Modern lighting System 5) Stage material change 6) New curtains 7) all damp treatment 8) Roof ventilation 9) Air conditioning

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?		√		
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?	√			By Building staffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins inside or outside
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few food waste, banners and poster
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		

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Items	Yes	No	NA	Remarks
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Assistant register- in charge
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*		√		
Are all the sources of drinking water in good condition?		√		
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 6 toilets
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?		√		

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Items	Yes	No	NA	Remarks
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*		√		
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?		√		
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

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Name of Faculty/Department/Institute	Faculty of Fisheries- Dean Building/Prof. Aminul Haque Bhobon
Name and Designation of Contact Person	Md. Askender Alam, Deputy Register.
Date of Inspection/Audit	14/03/2024
Location of the Building (geographical coordinates)	24°43'34"N 90°26'04.8"E
Age of the Building (i.e., year it was first used)	Built in 1967
Approximate Number of Building Users/Occupants	Around 400+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor-** Gallery classroom, office room, dean room, teachers' room, toilet **1st Floor-** Teachers room, classroom, toilets **2nd Floor-** Classrooms, toilets **3rd Floor-** Classroom, Conference room, toilets
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation (window, sunshades) 2) Modern furniture implementation 3) Toilet renovation, Male, female segregation 4) Better lighting system

Items	**Yes**	**No**	**NA**	**Remarks**
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?		√		
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?		√		
Solid Waste Management				
Is there a waste collection in the building?	√			By Building staffs
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few food waste, chemical waste

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Items	Yes	No	NA	Remarks
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Dean
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?	√			Insufficient
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 9 toilets, 1Teacher, 1Male and 1Female each floor
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		

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Items	Yes	No	NA	Remarks
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*		√		During summer students feels suffocated
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a "no smoking" policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			25 cycle and bike parking, insufficient car parking
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?		√		
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		

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Items	Yes	No	NA	Remarks
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

Name of Faculty/Department/Institute	Faculty of Fisheries-Faculty Building
Building No. on Map	17
Name and Designation of Contact Person	Prof. Dr. Kaiser Ahmed Sumon, Head of Faculty of Fisheries management.
Date of Inspection/Audit	14/03/2024
Location of the Building (geographical coordinates)	24°43'33.6"N 90°26'07"E
Age of the Building (i.e., year it was first used)	Built in 1967
Approximate Number of Building Users/Occupants	Around 550+
Brief description of the building (Note: Indicate number of floors and describe by floors, e.g., 1st floor – library, office of the dean, number of classrooms, number of labs, etc.)	**Ground Floor- Department of Aquaculture, Fisheries Biology & Genetics and Fisheries Management-** Gallery Classroom, Fisheries Biology and genetics Lab, Live Food Lab, Regular Classroom, Water Quality and Pond Dynamic Lab, Fish Genetic Lab, Aquatic Conservation lab, Limnology lab, Teachers room, office room, Toilets **1st Floor-** Fishing Technology lab, Fisheries Microbiology lab, Fisher's resource center, Aquaculture lab, store room, Fish disease lab, Ecology Lab, Fish processing and quality control lab, Fish nutation lab, stuff room, toilets Other side of the block is designated for the teachers only.
Brief description of the proposed scope of renovation/refurbishment (e.g., replacement of lighting system, separation of male/female toilet, etc.)	1) Classroom renovation (window, sunshades) 2) Modern furniture implementation 3) Toilet renovation, Male, female segregation 4) Better lighting system

Items	Yes	No	NA	Remarks
Laboratory Facilities				
Is there any laboratory in the building? If yes, what type of laboratory (e.g., animal research, academic, chemical, biosafety, etc.) and how many?	√			
If there is biosafety laboratory, what is the biosafety level?		√		
Is there an overall coordinator who manages the laboratories in the building?	√			Head of the department
Solid Waste Management				

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Items	Yes	No	NA	Remarks
Is there a waste collection in the building?	√			Building staff
Are there garbage bins provided, segregation of waste, or signs/billboards/information about types of waste to de disposed?		√		No bins
Is there a waste reduction program and/or recycling in the building?		√		
What types of waste are generated in the building? *(e.g., laboratory wastes, papers, food, etc. Please indicate in the Remarks)*	√			Mainly dry waste like papers, few foods waste, chemical waste, fish waste
Is there an overall campus waste management program (e.g., incinerator, temporary collection site prior to collection by Mymensingh local government, etc.)?		√		
Are there signages showing where to dispose the wastes?		√		
Firefighting and Emergency Preparedness				
Are there signages or posters on emergency procedures (e.g., fire, earthquake, etc.)?		√		
Are safety drills on emergency preparedness (e.g., fire, earthquake, etc.) being done regularly? If so, how frequent?		√		
Is there a coordinator (or designated staff) for emergency?	√			Dean
Is there a staff trained to use the firefighting or emergency notification system for basic level of preparedness?		√		
Are there resources available in the building in case of an emergency (e.g., fire-extinguishers, fire hose, etc.)?		√		
Are all exits from the building clearly marked or illuminated “Exit” signs?		√		No emergency exit
Are working emergency lights provided in the building?		√		
Health and Safety				

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Items	Yes	No	NA	Remarks
Is there access to safe drinking water (e.g., water fountain, drinking faucet, etc.)? *Indicate number of drinking faucets or sources in the Remarks.*	√			Submersible water system
Are all the sources of drinking water in good condition?	√			
Is the quality of drinking water tested regularly? If so, how often is the test?		√		
Are there toilets in the building*? Please indicate in the Remarks the number of toilets)*	√			Total 12 toilets
Are the toilets in good condition?		√		
Are first-aid kits available in the building?		√		
Is there access to medical clinic or hospital within BAU?	√			
Is the building well-lighted?	√			
Is ventilation adequate*? Please indicate in the Remarks the number of electric fans, aircon units, and their condition)*	√			
Are there courses or seminars conducted on health and safety for students, faculty and staff (e.g., COVID-19)?		√		
Is there a “no smoking” policy in effect in BAU?		√		
Have students, faculty or staff complained of health problems that may be due to poor air quality?	√			
Are campus police or security officers available to ensure safety? *If so, please indicate the schedule or frequency of inspection in the Remarks.*	√			
Transportation				
Are bicycle racks and/or parking available in the building for students, faculty and staff?	√			Only for bicycle
Is transportation provided to students, faculty, and staff?	√			
If transportation is provided, is it free or a reasonable fee is charged?	√			Reasonable
Is there a ride share program (e.g., car pooling)?		√		

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Items	Yes	No	NA	Remarks
Grounds/Landscaping				
Is pesticides used in the maintaining the grounds/landscaping?	√			
Is there grounds waste composting?		√		
Energy and Water Management				
Is renewable energy used (e.g., solar water heating, solar panels, etc.)?		√		
Is there water harvesting?		√		
Are there water meters to monitor consumption?		√		
Is there any water and energy conservation program being implemented in the building?		√		

Please provide any other issues/concerns that may require further attention as observed during the building inspection.

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APPENDIX 4

Corrective Action Plan
SATEP

1. Most of the corrective actions are already included in Output 1 on renovation and refurbishment component. Refer to Appendix 2 on the scope of renovation and refurbishment for each building based on the inspection/audit completed in March 2024 by the consultant engaged by the government. A total cost estimate of $9.82 million has been allocated for the renovation and refurbishment of the 17 buildings inspected.

Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
1	Faculty of Agricultural Economics and Rural Development- Faculty and Dean Building	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Firefighting and emergency preparedness	• Provide emergency lights and equipment (e.g., fire extinguishers) • Post signs on emergency procedures (i.e., routes of escape, etc.) • Conduct drills regularly • Prepare a disaster and emergency preparedness plan, identify building coordinators and team; and train emergency coordinators and team			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			students and staff (e.g., COVID-19, SEAH, etc.)			
		Transportation	• Designate parking area and provide clear and visible signs for safety • Explore possibility of carpooling • Undertake initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting			
2	Faculty of Animal Husbandry (Main building)	Solid waste management	• Implement waste collection • Provide appropriate bins • Install billboards on signs on types of waste to be disposed • Consider implementing waste reduction or recycling program in the building • Designate staff to deal with waste management	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and Emergency Preparedness	• Install clear and visible signs on emergency procedures • All exit signs should be lighted and ensure that they are in working condition • Conduct emergency and safety drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			on health and safety to students and staff (e.g., COVID-19, SEAH, etc) • Improve condition of toilets and/or replace toilet bowls • Explore energy and water conservation measurements			
		Transportation	• Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting			
3	Gymnasium	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Conduct drills regularly • Prepare a disaster and emergency preparedness plan, identify building coordinators and team; and train emergency coordinators and team			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc) • Improve condition of toilets and/or replace toilet bowls • Improve ventilation by replacing old and not working fans/exhaust with energy efficient ventilation system			
		Transportation	• Designate parking area and provide clear and visible signs for safety • Explore possibility of carpooling • Undertake initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
4	Dean Building/ Kazi Fazlur Rahman Bhaban	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., fire extinguishers) • Clearly mark and light exit signs from the building			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Post signs on emergency procedures (i.e., routes of escape, etc.) • Provide emergency exit stairs • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc) • Improve condition of toilets and/or replace toilet bowls • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system			
		Transportation	• Explore possibility of carpooling • Consider initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
5	Library	Solid waste management	• Provide bins for waste segregation	BAU	Contractor, PMU	Included in the Project Cost

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Post signs to show disposal sites • Initiate waste reduction program			
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc) • Improve condition of toilets and/or replace toilet bowls			
		Transportation	• Explore possibility of carpooling • Consider initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
6		Solid waste management	• Post signs to show disposal sites			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
	Faculty of Veterinary Science-Building 1		• Initiate waste reduction program			
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.)			
		Transportation	• Explore possibility of carpooling • Consider initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Revisit renewable energy sources • Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
7	Faculty of Veterinary Science-Building 2	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Designate staff to oversee waste management • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness • Conduct emergency drills regularly to students and staff			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc) • Improve condition of toilets and/or replace toilet bowls • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system			
		Transportation	• Explore possibility of carpooling			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Consider initiatives or programs to promote green transportation such as use of bicycle			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
8	Faculty of Veterinary Science-Building 3	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Designate staff to oversee waste management • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness • Conduct emergency drills regularly to students and staff			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system			
		Transportation	• Allocate area for appropriate parking • Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
9	Faculty of Agriculture Engineering and Technology- Dean Building	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Designate staff to oversee waste management • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
		Health and safety	• Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing and provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls			
		Transportation	• Consider providing additional parking for bicycles • Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
10	Faculty of Agriculture Engineering and Technology- Faculty Building	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Provide regular training on biosafety • Improve condition of toilets and/or replace toilet bowls • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system			
		Transportation	• Consider providing additional parking for bicycles • Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
11	Department of Agriculture Extension Education (DAEE)	Solid waste management	• Post signs to show disposal sites	BAU	Contractor, PMU	Included in the Project Cost

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Initiate waste reduction program			
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls			
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Explore energy and water conservation measurements			
12	Agriculture Faculty- East Building	Solid waste management	• Provide bins for waste segregation • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
13	Agriculture Faculty Building- West Building	Solid waste management	• Provide bins for waste segregation • Provide regular waste collection and ensure appropriate disposal • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Designate staff to oversee emergency preparedness • Train designated staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.)			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls for students			
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
14	Department of Agroforestry	Solid waste management	• Provide bins for waste segregation and collection • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system			
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
15	Auditorium	Solid waste management	• Provide bins for waste segregation • Provide regular waste collection and ensure appropriate disposal • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Conduct emergency drills regularly			
		Health and safety	• Provide safe drinking water • Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve condition of toilets and/or replace toilet bowls			
		Transportation	• Provide additional parking for bicycles to promote green transportation • Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
16	Faculty of Fisheries- Dean Building/Prof. Aminul Haque Bhobon	Solid waste management	• Provide bins for waste segregation • Provide regular waste collection and ensure appropriate disposal • Post signs to show disposal sites • Initiate waste reduction program	BAU	Contractor, PMU	Included in the Project Cost
		Fire-fighting and emergency preparedness	• Provide emergency lights and equipment (e.g., working fire extinguishers) • Provide emergency exits			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls for students			
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption • Consider rainwater harvesting • Explore energy and water conservation measurements			
17	Faculty of Fisheries-Faculty Building	Solid waste management	• Provide bins for waste segregation • Provide regular waste collection and ensure appropriate disposal	BAU	Contractor, PMU	Included in the Project Cost

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Post signs to show disposal sites • Initiate waste reduction program			
		Fire-fighting and emergency preparedness	• Provide resources for emergency preparedness such as lights and equipment (e.g., working fire extinguishers) • Provide emergency exits • Clearly mark and light exit signs from the building • Post signs on emergency procedures (i.e., routes of escape, etc.) • Train staff on emergency preparedness • Conduct emergency drills regularly			
		Health and safety	• Test drinking water quality regularly (at least quarterly) • Provide first-aid kits and additional lights • Consider a “no smoking” policy, car-sharing, etc. • Provide courses/seminars on health and safety to students and staff (e.g., COVID-19, SEAH, etc.) • Improve ventilation by replacing old and not working fans/exhaust with adequate energy efficient ventilation system • Improve condition of toilets and/or replace toilet bowls			
		Transportation	Explore possibility of carpooling			
		Energy and water management	• Install water meter to monitor consumption			

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Building No.	Name of Building	Environmental Issue	Corrective Action	Responsible Unit	Implementation	Budget
			• Consider rainwater harvesting • Explore energy and water conservation measurements			

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APPENDIX 5

A. Environmental Codes of Practice

1. It is the responsibility of the Contractor (and their Subcontractor) to ensure the protection of each individual and adjacent properties from hazards and accidents during construction activities of the new buildings as well as in the renovation/refurbishment works of selected existing academic facilities. The Contractor is required to avoid, minimize, and prevent any potential adverse environmental impacts in undertaking the construction works, and comply with relevant community and occupational health and safety regulations of the government and the requirements of ADB.

2. **Code of conduct** To create a safe, respectful, and professional work environment for all workers and staff, the Contractor will require each person recruited to sign a code of conduct. This code of conduct aims to ensure that employees understand the expectations and consequences of their actions.

3. The following codes of practice provide guidance on the basic measures needed to minimize the environmental impacts of construction activities, and to ensure health and safety.

1. "Chance finds" of physical resources

Project activity: Excavation, land clearing and earthmoving works

Management measures

(i) Excavation works within the area of "chance find" will be stopped
(ii) Identify and mark the area with a global positioning system (GPS) unit to determine the exact location and take photographs
(iii) Secure the area discovered to avoid potential damage, loss or removal of any movable or transportable object
(iv) Inform the PIC of the "chance find" and designate a security personnel until a representative from the Ministry of Cultural Affairs arrives

2. Waste management

Project activity: Generation of waste at construction sites

Management measures

(i) Identify the activities that will generate waste and identify location for temporary disposal and government-approved disposal sites
(ii) Develop waste management plan for different waste streams prior to start of construction works
(iii) Orient workforce on disposal of waste, the location of disposal site and specific requirements for management of these sites
(iv) Wastes that cannot be re-used will be disposed of safely at government-approved disposal sites

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(v) Minimize generation of waste by implementing 3Rs (Reduce, Re-use, Recycle), and segregate waste at source
(vi) Waste will be transported in fully covered trucks to prevent spillage along the way
(vii) Provide appropriate bins/containers for waste at the construction sites
(viii) Conduct orientation to workforce on waste management practices
(ix) Require workers to always observe good housekeeping

Project activity: Handling of hazardous waste

Management measures

(i) Chemical wastes are stored in sealed container and properly labelled
(ii) All chemical containers such as paints are labelled properly for easy identification
(iii) Material Safety Data Sheets (MSDS) of all chemicals onsite during construction are maintained and properly recorded. Designate staff to oversee handling of chemicals.
(iv) Chemicals and other hazardous materials are stored in bunded place or in an area lined with impervious material to prevent soil contamination and away from drainage system
(v) Store sufficient stock of absorbent materials for used chemicals or spent lubricants, lube oil, etc.

3. Air pollution – vehicular emissions and generation of dust

Project activity: Movement of construction vehicles and use of machinery and equipment

Management measures

(i) Prepare air quality management plan as part of the overall construction environmental management plan and consult PIC and PMU for concurrence/approval
(ii) Keep construction vehicles in good working condition and limit idling time of not more than 2 minutes
(iii) Cover trucks and other vehicles transporting materials that generate dust
(iv) Implement speed limits on vehicular movement within the construction sites
(v) Sprinkle water to crusher and orient workers to follow good practices while handling material in concrete-mix plant

Project activity: Site development and civil works

Management measures

(i) Spray water regularly (or as needed) to unpaved and opened land areas, material stockpiles, and access roads to contain dust
(ii) Dust-generating construction activities will be enclosed to minimize dispersion
(iii) Workers assigned to activities generating high dust level will be provided with PPE such as masks, goggles, etc.
(iv) Must ensure that there will be minimum generation of dust and waste while unloading the materials from delivery trucks or construction vehicles

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(v) Materials generating dust such as sand and gravel will be covered particularly during non-working hours.
(vi) Re-vegetate opened areas (if possible) to limit area of exposed land
(vii) Stock cement and other dust-generating materials in covered space
(viii) Provide area for mixing and loading of construction materials.
(ix) Burning of solid waste within the construction sites will not be allowed.
(x) Batching plant (if required) will be located upwind of the construction sites or outside BAU.

4. Noise and vibration

Project activity: Movement of vehicles

Management measures

(i) Regular upkeep and maintenance of construction vehicles to minimize generation of unwanted noise
(ii) Drivers of construction vehicles to comply with speed limits
(iii) Use of horns will be allowed only when necessary
(iv) Divert routes to minimize traffic, observe loading and unloading procedures, and to minimize unnecessary noise at the construction sites

Project activity: Use of construction machinery and equipment

Management measures

(i) Enclosure and/or isolation of noise-generating machinery and equipment to contain noise levels
(ii) Identify and organize all noise-generating activities to minimize increase in ambient noise levels
(iii) Proper and regular maintenance of equipment and machinery to avoid unwanted generation of noise
(iv) Avoid the use of alerts, horns, or sirens unless absolutely necessary like emergency
(v) Observe prayer times at the mosque next to Isha Khan Hall and other mosques close to construction sites

Project activity: Earthmoving and construction activities

Management measures

(i) Nearby residents are notified of noise generating activities, time and duration
(ii) Operators of heavy equipment and machineries will be oriented on construction techniques to reduce generation of noise
(iii) Temporary noise barriers or enclosures are installed, where needed
(iv) Onsite deliveries will be planned to minimize noise from delivery trucks
(v) Noise-generating activities will be conducted only during daytime (7 a. m. to 10 p.m.)
(vi) Schedule of noise-generating activities and deliveries of materials will be coordinated with the project implementation committee (PIC) and the project

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management unit (PMU) to ensure minimal disruption to students and activities particularly in Kharim Bhavan and Isha Khan Hall

5. Occupational health and safety

Project activity: Construction works at the new buildings for BICAR, HCDI and IIFS, and renovation/refurbishment works at the selected existing academic facilities

Management measures

(i) Prepare a schedule of construction works, routing of traffic (if needed), possible health concerns (exposure to dust, noise, and vibration) in consultation with PIC, PMU and potentially affected local people (i.e., students, faculty, staff, etc.)
(ii) Set-up a health and safety committee and designate an occupational health and safety (OHS) Officer
(iii) Provide workers with personal safety equipment (PPE) such as footwear, gloves and eye protection devices, helmets, etc.
(iv) Prepare an emergency preparedness and action plan; inform workers and conduct orientation/training
(v) Maintain PPE properly by cleaning dirty ones and replace damaged sets.
(vi) Provide adequate lighting, drainage systems to prevent water stagnation, and adequate space to administer first aid
(vii) Implement appropriate standards of safety to all workers and site visitors to comply with the national requirements and the World Bank-IFC EHS 2007 (also refer to other standards such as OSHA, ACGIH, etc.)
(viii) Conduct toolbox meetings prior to start of construction works. Record names of workers present during the meetings. Worker not joining toolbox meeting will not be allowed to work.
(ix) Enforce safety procedures and provide training on PPE to workers
(x) Clear and visible danger and warning signs shall be placed as soon as construction begins and will remain until works are completed.
(xi) Keep a record of workers and place assigned
(xii) Child labor - Contractor will not hire workers below 15 years old

Project activity: Dismantling works from selected existing academic facilities for renovation/refurbishment

Management measures

(i) A dismantling plan is prepared for approval by PIC and PMU
(ii) Dismantling plan will include a survey for the presence of asbestos or asbestos-containing material
(iii) Appropriate permits (if required) secured prior to any dismantling works
(iv) Users of nearby building (e.g., Kharim Bhavan and Isha Khan Hall East and West, mosque, etc.) should be notified at least a week prior to start of dismantling activities
(v) Measures to contain dust and noise levels will be implemented such as temporary enclosures
(vi) Hauling of dismantling debris will be organized/planned to avoid traffic and inconvenience to students, faculty, and staff members

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(vii) Identify materials than can be recovered, reused, and recycled (if any)
(viii) Disposal of waste collected/debris will be properly carried out in areas approved by Mymensingh City Corporation
(ix) Adequate time and prior notice will be given to the building users (e.g., students, faculty, and staff) before dismantling work is done
(x) Indoor air quality and noise will be within the occupational health and safety standards during dismantling works (refer to OSHA, OHS Policy 2013 of Bangladesh)
(xi) Relevant utility agency will be notified in advance if the service will be affected by the dismantling works
(xii) Utility service retained such as electricity or gas will be adequately protected to prevent accidents
(xiii) Temporary braces, scaffolds or other protection should be installed to ensure stability of the structure
(xiv) Workers doing the dismantling works are protected and prevent unauthorized access in areas to be dismantled
(xv) Dismantling debris will be progressively removed to prevent piling up, constrict access, and may cause health and safety hazard

Project activity: Training and record keeping

Management measures

(i) Keep a record of occupational accidents (also near miss), diseases, and injuries to be included in monthly project progress reports submitted to the PIC and PMU
(ii) Prevent work-related accidents or injury by minimizing workplace hazards consistent with international best practices (refer to ILO Health and Safety in Construction 2022)
(iii) Ensure arrangements with health care facilities are done and first aid kits are readily available at the construction sites and work areas
(iv) Train construction workers about general health and safety practices, and on specific hazards related to their work
(v) Conduct orientation on SEAH, COVID-19 (and other communicable diseases) and the safety measures that will be implemented to prevent incidence in the workplace

Project activity: Security at the construction site

Management measures

(i) Security personnel will be deployed to prevent unauthorized entry at construction sites
(ii) All the tools, equipment and construction materials at the sites are accounted for, identified, clearly labelled/marked, and recorded
(iii) Maintain a record of tools' serial numbers and check inventory on a regular basis
(iv) Implement an inventory system where tools and equipment are checked in and out, securely stored when not in use to prevent theft
(v) Provide proper fencing of construction site perimeters with secured chain and lock

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(vi) Construction sites will have controlled access points to allow for close monitoring of entry and exit from the sites
(vii) Workers will have proper identification while within the construction sites
(viii) Staff or workers required to have access to the sites after working hours will be notified with the PIC and PMU
(ix) Provide adequate lighting, and clear and visible safety signs at the job sites
(x) Conduct pre-employment investigations to verify previous employment, references (if needed), education and criminal background (a police clearance may be required)

6. Community health and safety

Project activity: Construction works at the new buildings (BICAR, HCDI and IIFS)

Management measures

(i) Designate staff to deal with community health and safety (the OHS Officer can be the designed staff
(ii) Install clear and visible safety signboards at the construction sites
(iii) Provide temporary crossings or alternate access to the public if existing roads near the construction sites will be affected. Crossings/temporary paths will consider children, elderly, pregnant women, and persons with disabilities to ensure their safety.
(iv) Construction sites will be temporarily fenced and a security personnel assigned to prevent unauthorized access
(v) Involve community representatives (to the extent possible) during safety mock drills
(vi) Carry out community consultations and/or information dissemination on the progress of project implementation

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APPENDIX 6

Proposed Environmental Site Inspection and Monitoring Checklist

Loan No.:

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

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
Site Office				
Site office established				
Contractor appointed an EHS supervisor				
EHS supervisor or designated person on-site				
Copies of EMP, contract document, and environmental clauses on-site				
Details of construction (i.e., name of contractor, duration of construction, emergency hotline, safety, etc.) disclosed on-site				
Details of grievance redress mechanism (i.e., contact person, complaints hotline, etc.) disclosed onsite				
Complete first aid kits on-site				
Photographs of before and after completion of work on board				
Incident register book on-site				
Complaint/visitor's comment book available				
Record of regular consultation of Contractor to University management and/or nearby residents to check if there are environmental concerns				
Any complaint filed with the contractor by staff and settlements				
Disturbed areas properly re-vegetate after completion of work				
Emergency Preparedness and Response				
Fire extinguishers/fire-fighting equipment properly maintained and not expired				
Fire escapes properly marked, clear, and not obstructed				
Emergency contacts available in case of any incident				
Accidents/incidents reported, reviewed, and corrective/preventive actions recorded				
Occupational Health and Safety (OHS)				
Provision of labor and equipment shed				
Provision of hygiene and sanitation facilities and drinking water				
Use of personal protective equipment (PPEs)				
Installation materials and equipment storage				
Separate storage of fuel and lubricant				
Training on OHS, use of PPE, etc. done before construction works				
Clear danger and warning signs on-site for students, faculty and community				

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Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
Fencing of construction site and designation of security personnel				
Good housekeeping - site kept clean and tidy				
Containers properly labelled for ease of recycling/waste segregation				
Special facilities for female labor				
Bin for collecting garbage and food waste				
Air Quality				
Opened land and construction sites sprayed with water to minimize generation of dust				
Any evidence of excessive dust generation				
Stockpiles of dusty materials and dust-generation activities like handling of cement done in enclosed areas or sprayed with water				
Vehicles carrying dusty loads/materials covered or watered over before leaving the site				
Construction equipment well maintained (any black smoke or smoke belching observed)				
Demolition work areas watered				
Speed control measures applied (e.g. speed limit sign)				
Noise				
Evidence of excessive noise				
Any noise mitigation measure adopted (e.g. use noise barrier/enclosure)?				
Prohibition of using megaphone/whistle on-site				
Use of well-maintained equipment and vehicles only				
Water Quality				
Construction wastewater and domestic wastewater discharged to sewer systems or are on-site treatment facilities (septic tank)				
Wastewater discharged to soil				
Evidence of oil spill				
Chemicals properly stored and labelled				
Spill kits/sand /saw dust used for absorbing chemical spillage readily accessible				
Special facilities for female labor				
Construction waste/recyclable materials and general refuse removed off-site regularly				
Water pipe leakage and wastage prevented				

Reviewed by:

Name and signature: _____ Date: _____
Designation: _____

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APPENDIX 7

Applicable Biosafety Requirements based on Bangladesh Biosafety Guidelines 2020

Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
BSL 2 Similar to BL1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It differs in that (1) laboratory personnel are directed by experienced scientists, (2) access to the laboratory is limited when work is being conducted, and (3) certain procedures (in which infectious aerosols are created) are conducted in biological safety cabinets or other physical containment equipments.	(i) When experiments are in progress, access to the laboratory is limited or restricted at the discretion of the laboratory director. (ii) Work surfaces are decontaminated once a day and after any spill of viable material. (iii) All contaminated liquid or solid wastes are decontaminated before disposal. (iv) Mechanical pipetting devices are used; mouth pipetting is prohibited. (v) Eating, drinking, smoking and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designated and used for that purpose only. (vi) Persons wash their hands after they handle materials involving organisms containing rDNA molecules and animals and before leaving the laboratory. (vii) All procedures are performed carefully to minimize the creation of aerosols. (viii) Laboratory personnel wear laboratory coats, gowns or uniforms to prevent contamination or soiling of street clothes. (ix) Contaminated materials that are to be decontaminated at a site away from the laboratory should be placed in a durable, leak-proof container, which is closed before being removed from the laboratory. (x) Experiments of lesser biohazard potential can be carried out concurrently	(i) Biological safety cabinets (see Section 4.4, Class I or II) or other appropriate personal protective or physical containment devices are used whenever necessary. (ii) Proper containment is applied when procedures with a high potential for creating aerosols are conducted. These may include centrifuging, grinding, blending, vigorous shaking or mixing, sonic disruption, opening containers of materials whose internal pressures may be different from ambient pressures, inoculating animals and harvesting infected tissues from animals or eggs. (iii) Proper containment is applied when high concentrations or large volumes of organisms containing rDNA molecules are used. Such materials may be centrifuged in the open laboratory if sealed heads or centrifuge safety cups are used and if they are opened only in a biological safety cabinet.	(i) The laboratory is designed in such a way that it can be cleaned easily. (ii) Bench tops are impervious to water and resistant to acids, alkalis, organic solvents and moderate heat. (iii) Laboratory furniture is sturdy. Space between benches, cabinets and equipment are accessible for cleaning. (iv) An autoclave for decontaminating laboratory wastes is available.

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	in carefully demarcated areas of the same laboratory. (xi) The Laboratory director limits access to the laboratory. The director has the final responsibility for assessing each circumstance and determining who may enter or work in the laboratory. (xii) The laboratory director establishes policies and procedures whereby only persons who have been advised of the potential hazard and who meet specific entry requirements (e.g., immunization) can enter the laboratory or animal rooms. (xiii) When the organisms containing rDNA molecules in use in the laboratory require special provisions for entry (e.g., vaccination), a hazard warning sign incorporating the universal biohazard symbol (see Annex.-8) is posted on the access door to the laboratory work area. The hazard warning sign identifies the agent, lists the name and telephone number of the laboratory director or other responsible persons, and indicates the special requirements for entering the laboratory. An insect and rodent control program is in effect as certified by a licensed pest control operator. (xiv) Laboratory coats, gowns, smocks, or uniforms are worn by personnel while in the laboratory. While entering the laboratory, personnel should change the shoes and wear shoes specified for the laboratory. Before personnel leave the laboratory for non-laboratory areas (e.g., cafeteria, library, administrative offices etc.), this protective clothing is		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	removed and left in the laboratory or is covered with a clean coat not used in the laboratory. (xv) Animals not involved in the work being performed are not permitted in the laboratory. (xvi) Special care is taken to avoid skin contamination with organisms containing rDNA molecules; gloves should be worn when handling experimental animals and when skin contact with the agent is unavoidable. (xvii) All wastes from laboratories and animal rooms are appropriately decontaminated according to acceptable minimum standards for proper disposal. (xviii) Hypodermic needles and syringe are used only for parental injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., needle is integral to the syringe) are used for injection or aspiration of fluids containing organisms that have rDNA molecules. Extreme caution should be observed when handling needles and syringes to avoid auto-inoculation and generation of aerosols during use and disposal. Needles should not be bent, sheared, replaced in the needle sheath or guard, or removed from the syringe following use. The needle and syringe should be promptly placed in a puncture - resistant container and decontaminated, preferably by autoclaving, before discard or re-use.		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	(xix) Spills and accidents that result in over-exposures to organisms containing rDNA molecules are immediately reported to the laboratory director and the IBC. Medical evaluation, surveillance and treatment are provided as appropriate and written records are maintained. (xx) When appropriate, considering the agent (s) handle, baseline serum samples for laboratory and other personnel at-risk are collected and stored. Additional serum specimens may be collected periodically, depending on the agent handles or the function of the facility. (xxi) A Biosafety manual is prepared or adopted. Personnel are advised of special hazards and are required to read instructions on practices and procedures and to follow them.		
BSL 3 BL3 is applicable to clinical diagnosis, teaching, research or production facilities where work is done with indigenous or exotic agents that may cause serious or potentially lethal diseases as a result of exposure by inhalation. Laboratory	(i) When experiments are in progress, access to the laboratory is limited or restricted at the discretion of the laboratory director. (ii) Work surfaces are decontaminated once a day and after any spill of viable material. (iii) All contaminated liquid or solid wastes are decontaminated before disposal. (iv) Mechanical pipetting devices are used; mouth pipetting is prohibited. (v) Eating, drinking, smoking and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designated and used for that purpose only. (vi) Persons wash their hands after they handle materials involving organisms	Biological safety cabinets (see Section 4, Class I, II, or III) or other appropriate combinations of personal, protective or physical containment devices (e.g., special protective clothing, masks, gloves, respirators, centrifuge, safety cups, sealed centrifuge rotors, and containment caging for animals) are used for all activities with organisms containing rDNA molecules, which pose a threat of aerosol exposure. These include manipulation of cultures and of clinical or environmental materials which may be a source of aerosols; the aerosol challenge of experimental animals, harvesting infected tissues or fluids from experimental animals and embryonate eggs, and necropsy of experimental animals.	(i) The laboratory is separated from areas which are open to unrestricted traffic flow within the building. Passage through two sets of doors is the basic requirement for entry into the laboratory from access corridor or other contiguous areas. Physical separation of the high containment laboratory from access corridors or other laboratories or activities may also be provided by double-door clothes change room (showers may be included), air lock, or other access facility which requires passage

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
personnel have specific training in handling pathogenic and potentially lethal agents and are supervised by competent scientists who are experienced in working with these agents. All procedures involving manipulation of infectious material are conducted within biological safety cabinets or other physical containment devices. Personnel wear appropriate personal protective clothing and devices. The laboratory has special engineering and design features. It is recognized, however, that existing facilities may not have all the facility safeguards	containing rDNA molecules and animals and before leaving the laboratory. (vii) All procedures are performed carefully to minimize the creation of aerosols. (viii) Laboratory personnel wear laboratory coats, gowns or uniforms to prevent contamination or soiling of street clothes. (ix) Contaminated materials that are to be decontaminated at a site away from the laboratory should be placed in a durable, leak-proof container, which is closed before being removed from the laboratory. (x) Experiments of lesser biohazard potential can be carried out concurrently in carefully demarcated areas of the same laboratory. (xi) The Laboratory director limits access to the laboratory. The director has the final responsibility for assessing each circumstance and determining who may enter or work in the laboratory. (xii) The laboratory director establishes policies and procedures whereby only persons who have been advised of the potential hazard and who meet specific entry requirements (e.g., immunization) can enter the laboratory or animal rooms. (xiii) When the organisms containing rDNA molecules in use in the laboratory require special provisions for entry (e.g., vaccination), a hazard warning sign incorporating the universal biohazard symbol (see Annex.-8) is posted on the access door to the laboratory work area. The hazard warning sign identifies the agent, lists		through two sets of doors before entering the laboratory. (ii) The interior surfaces of walls, floors and ceilings are water resistant so that they can be easily cleaned. Penetrations in these surfaces are sealed or capable of being sealed to facilitate decontamination of the area. (iii) Bench tops are impervious to water and resistant to acids, alkalis, organic solvents and moderate heat. (iv) Laboratory furniture is sturdy and spaces between benches, cabinets and equipment are accessible for cleaning. (v) Each laboratory contains a sink for hand washing. The sink may be operated by foot, by elbow or automatically and is located near the laboratory exit door. (vi) Windows in the laboratory are closed and sealed. (vii) Access doors to the laboratory or containment module are self-closing. (viii) An autoclave for decontaminating laboratory waste is available, preferably within the laboratory. (ix) A ducted exhaust air ventilation system is provided. This system creates directional airflow that draws air into the laboratory through the entry area. The exhaust air is not

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
recommended for BL3 (e.g., access zone sealed penetrations and directional airflow, etc.). In such cases, the proponent must show proof of access to BL3 facilities. Under these circumstances, acceptable safety may be achieved for routine or repetitive operations (e.g., diagnostic procedures involving the propagation of agent for identification, typing and susceptibility testing) in laboratories where facility features satisfy BL2 recommendations, provided the recommended "Standard Microbiological Practices", "Special Practices" and "Containment	the name and telephone number of the laboratory director or other responsible persons, and indicates the special requirements for entering the laboratory. An insect and rodent control program is in effect as certified by a licensed pest control operator. (xiv) Laboratory coats, gowns, smocks, or uniforms are worn by personnel while in the laboratory. While entering the laboratory, personnel should change the shoes and wear shoes specified for the laboratory. Before personnel leave the laboratory for non-laboratory areas (e.g., cafeteria, library, administrative offices etc.), this protective clothing is removed and left in the laboratory or is covered with a clean coat not used in the laboratory. (xv) Animals not involved in the work being performed are not permitted in the laboratory. (xvi) Special care is taken to avoid skin contamination with organisms containing rDNA molecules; gloves should be worn when handling experimental animals and when skin contact with the agent is unavoidable. (xvii) All waste from laboratories and animal rooms are appropriately decontaminated according to acceptable minimum standards for proper disposal. (xviii) Hypodermic needles and syringes are used only for parental injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., needle is		recalculated to any other area of the building, is discharged to the outside, and is dispersed away form the occupied areas and air intakes. Personnel must verify that the direction of the airflow (into the laboratory) is proper. The exhaust air from the laboratory room should be filtered before it is discharged to the outside to be sure it is not contaminated. (x) The HEPA-filtered exhaust air from Class I or Class II biological safety cabinets may be recalculated within the laboratory if the cabinet is tested and certified at least every 12 months. If the HEPA-filtered exhaust air from Class I or II biological safety cabinets is to be discharged to the outside through the building exhaust air system, it should be connected in a manner [e.g., thimble unit connection] that avoids any interference with the air balance of the cabinets or building's exhaust system.

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
Equipment" for BL3 are rigorously followed. The decision to implement this modification of BL3 recommendations should be made only by the laboratory director.	integral to the syringe) are used for injection or aspiration of fluids containing organisms that have rDNA molecules. Extreme caution should be observed when handling needles and syringes to avoid auto-inoculation and generation of aerosols during use and disposal. Needles should not be bent, sheared, replaced in the needle sheath or guard, or removed from the syringe following use. The needle and syringe should be promptly placed in a puncture - resistant container and decontaminated, preferably by autoclaving, before discarding or re-use. (xix) Spills and accidents that result in over-exposures to organisms containing rDNA molecules are immediately reported to the laboratory director and the IBC. Medical evaluation, surveillance and treatment are provided as appropriate and written records are maintained. (xx) When appropriate, considering the agent (s) handle, baseline serum samples for laboratory and other personnel at-risk are collected and stored. Additional serum specimens may be collected periodically, depending on the agent handles or the function of the facility. (xxii) A Biosafety manual is prepared or adopted. Personnel are advised of special hazards and are required to read instructions on practices and procedures and to follow them. (xxiii) All contaminated liquid or solid wastes are decontaminated before disposal.		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	(xxiv) Persons under 18 years of age are not allowed to enter the laboratory. (xxv) If experiments involving other organisms that require lower levels of containment are to be conducted in the same laboratory concurrently with work requiring BL3 level physical containment, such experiments shall be conducted in accordance with all BL3 level practices. (xxvi) Laboratory doors are kept closed when experiments are in progress. (xxvii) Contaminated materials that are to be decontaminated at a site away from the laboratory are placed in a durable, leak proof container, which is closed before being removed from the laboratory. (xxviii) The laboratory director controls access to the laboratory and restricts access to persons whose presence is required for program or support purposes. The director has the final responsibility of assessing each circumstance and determining who may enter or work in the laboratory. (xxix) The laboratory director establishes policies and procedures whereby only persons who have been adduced of the potential biohazard who meet any specific entry requirements (e.g., immunization) and who comply with all entry and exit procedures enter the laboratory of animal rooms. (xxx) When organisms containing rDNA molecules or experimental animals are present in the laboratory or containment module, a hazard warning sign incorporating the universal biohazard symbol is posted on all laboratory and		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	animal room access doors. The hazard warning sign identifies the agent, lists the name and telephone number of the laboratory director or other responsible persons and indicates any special requirements for entering the laboratory, such as the need for immunization, respirators or other personal protective measures. (xxxi) All activities involving organisms containing rDNA molecules are conducted in biological safety cabinets or other physical containment devices within the containment module. No work in open vessels is conducted on the open bench. (xxxii) The work surfaces of biological safety cabinets and other containment equipment are decontaminated when work with organisms containing rDNA molecules is finished. Plastic-backed paper toweling used on nonperforated work surfaces within biological safety cabinets facilitates cleaning up. An insect and rodent program is in effect as certified by a licensed pest control operator. (xxxiii) Laboratory clothing that protects street clothing (e.g., solid front or wrap-around gowns, scrub suits, coveralls) is worn in the laboratory. Laboratory clothing is not worn outside the laboratory and is decontaminated before being laundered. (xxxiv) Special care is taken to avoid skin contact with contaminated materials; gloves should be worn when handling infected animals and when skin contact with infectious materials is unavoidable.		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	(xxxv) Molded surgical masks or respirators are worn in rooms containing experimental animals. (xxxvi) Animals and plants not related to the work being conducted are not permitted in the laboratory. (xxxvii) Laboratory animals held in a BL3 area are housed in partial-containment caging systems, such as Horsfall units, open cages placed in ventilated enclosures, solid-wall and bottom cages covered by filter bonnets or solid-wall and bottom cages placed on holding racks equipped with ultraviolet radiation lamps and reflectors. **(NOTE:** Conventional caging systems may be used provided that all personnel wear appropriate personal protective devices. These shall include at a minimum, wrap-around gowns, head covers, gloves, shoe covers, and respirators. All personnel shall shower on exit from areas where these devices are required.) (xxxviii) All waste from laboratories and animal rooms are appropriately decontaminated before disposal. (xxxix) Vacuum lines are protected with High Efficiency Particulate Air (HEPA) filters and liquid disinfectant traps. (xl) Baseline serum samples for all laboratory and other personnel at-risk should be collected and stored for reference purposes. Additional serum specimens may be collected periodically depending on the agents handled or function of the laboratory. (xli) Alternative selection of containment equipment is possible. Experimental		

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Biosafety Level	Procedures to Maintain	Containment Equipment Required	Laboratory Facilities Required
	procedures involving a host-vector system that provides a one-step higher level of biological containment than that specified can be conducted in the BL3 laboratory, using containment equipment specified for the BL2 level of physical containment. Experimental procedures involving a host-vector system that provides a one-step lower level of biological containment than that specified can be conducted in the BL3 laboratory using containment equipment specified for the BL4 level of physical containment.		

Notes on Biological Safety Cabinets

Class I cabinet is a ventilated cabinet for personnel protection, air in it flows inward, away from the operator. The exhaust air from this cabinet filters through a HEPA filter. This cabinet is used in three operational models: (1) with full-width open front, (2) with an installed front closures panel (having four 5 inch-diameter openings) without gloves and (3) with an installed front closure panel equipped with arm-length rubber gloves. The face velocity of the inward flow of air through the full-width open front 75 feet per minute or greater.

Class II cabinet is a ventilated cabinet for personnel and product protection; it has an open front with inward airflow for personnel protection and HEPA filtered mass recalculated airflow for product protection. The cabinet exhaust air is filtered through an HEPA filter. The face velocity of the inward flow of air through the full-width open front is 75 feet per minute or greater.

Class III cabinet is a closed-front ventilated cabinet of gas-tight construction, which provides the highest level of personnel protection among biohazard safety cabinets. The interior of the cabinet is protected from contaminants outside of the cabinet. The cabinet is fitted with arm-length rubber gloves and is operated under a negative pressure of at least 0.5-inch water gauge. All air supply is filtered through HEPA filters. Exhaust air is filtered through two HEPA filters or one HEPA filter and incinerator before being discharged to the outside environment.

rDNA - Recombinant DNA, which is often shortened to rDNA, is an artificially made DNA strand that is formed by the combination of two or more gene sequences.
IBC - Institutional Biosafety Committee

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APPENDIX 8

Terms of Reference for Biosafety and Biosecurity Consultant

A. Background

1. Built upon the National Instrumentation Center for Environmental Management at the Seoul National University, the Bangladesh Instrumentation Center for Climate Change and Agricultural Research (BICAR) under the Bangladesh Agricultural University (BAU) is designed to be a cutting-edge research facility in the areas of imaging, climate-smart precision agriculture and modeling, chemical analysis, post-harvest technology and food processing, food safety, genomics and bioinformatics, and diagnostic and vaccine technology. BICAR aims to: (i) provide advanced equipment support to the researchers of BAU and other universities, (ii) provide laboratory services to individual clients and industries, (iii) conduct cutting-edge innovative research for developing commercialize end-products or technologies, and (iv) establish linkages with agro-industry and facilitate incubation process for commercialization of innovated products and technologies.

2. There will be three biosafety laboratories (BSL) in BICAR - (i) BSL 2, (ii) BSL 2+, and (ii) BSL 3. Given the wide range of research and academic activities that will be involved as well as the handling and storing of animal pathogens or toxins which will pose bio risks to personnel, the BAU community, and the environment, a laboratory biosafety manual and a biosecurity plan will be required for BICAR including an overall biosafety programme for BAU.

B. Objective and Purpose of the Assignment

3. The assignment aims to develop the biosafety programme of BAU together with the laboratory biosafety manual and biosecurity plan of BICAR that is: (i) aligned with international standards and guidelines, and (ii) defines policies, procedures, and resources to protect and minimize risks to personnel, researchers, visitors, students, facilities, and the environment from the use of, exposure to, and release of biological agents in teaching and research activities, and to guide them on the safe handling and disposal of biohazardous material.

C. Scope of Work

4. An experienced biosafety and biosecurity consultant will provide the required expertise and technical support in developing the biosafety programme of BAU and in preparing and finalizing the laboratory biosafety manual and biosecurity plan of BICAR.[89,90] The consultant will work together with relevant BAU academic staff, and the Expert Committees identified by BAU who set up the user requirements of BICAR.

D. Detailed Tasks and/or Expected Output

5. Duties and tasks of the biosafety and biosecurity consultant include but are not limited to the following:

(i) Carry out a review of the biosafety regulatory structure and procedures for agricultural biotechnology research in Bangladesh - policies, guidelines, regulations and other relevant documents on biosafety and biosecurity.

[89] WHO. Laboratory biosecurity guidance. Geneva: World Health Organization; 2024. https://iris.who.int/bitstream/handle/10665/377754/9789240095113-eng.pdf?sequence=1.

[90] WHO. Laboratory biosafety manual, fourth edition. Geneva: World Health Organization; 2020 (Laboratory biosafety manual, fourth edition and associated monographs). https://iris.who.int/bitstream/handle/10665/337956/9789240011311-eng.pdf?sequence=1.

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(ii) Conduct a baseline assessment on the status of biosafety and biosecurity practices and procedures including the institutional biosafety committee in BAU.
(iii) Conduct "needs assessment" for capacity building in BAU and identify the necessary training based on priority.
(iv) Review the proposed organizational structure of BICAR.
(v) Engage with the Expert Committees identified by BAU who defined the user requirements of BICAR.
(vi) Draft the laboratory biosafety manual and biosecurity plan for BICAR based on experts' consultations and baseline assessment of BAU.
(vii) Develop the biosafety program framework appropriate to the needs and requirements of BAU.
(viii) Organize consultative meetings to present the draft BICAR laboratory biosafety manual and biosecurity plan as well as the structure of the biosafety program framework to relevant BAU academic community, and potential users of BICAR.
(ix) Input suggestions and recommendations to the draft laboratory biosafety manual, and biosecurity plan for BICAR, and the biosafety program of BAU from the consultative meetings, review and finalize the documents.

E. Reporting Requirements

- BICAR – laboratory biosafety manual and biosecurity plan
- Biosafety Programme of BAU
- Training materials on the laboratory biosafety manual and the biosecurity plan of BICAR

F. Minimum Qualification Requirements

6. The biosafety and biosecurity consultant will be sourced through an international selection to provide two person-months of inputs or 44 working days within 12 months on an intermittent basis.

- He or she will have a PhD in relevant field such as biology, natural sciences, ecology and environmental management, and biotechnology or any other relevant scientific field
- A minimum of 8 years work experience in biosafety and/or laboratory biosecurity, with at least one year in a managerial or supervisory position; and must have a minimum of 5 years relevant experience working in a high-containment (BSL 3) laboratory facilities preferably in an academic/research laboratory
- Professional registration and certification on biosafety and biosecurity (e.g., Association for Biosafety and Biosecurity International) required
- Awareness of the international regulatory environment concerning invasive alien species (IAS) and living modified organisms - World Organization for Animal Health (OIE), Convention on Biological Diversity, Cartagena Protocol on Biosafety, International Plant Protection Convention guidelines, global good practice on the management of biosecurity such as the IUCN guidelines for the prevention of biodiversity loss caused by IAS, International Health Regulations of WHO among others
- Strong knowledge of the applicable biosafety and biosecurity regulations and university laboratory protocol requirements in Bangladesh is required
- Excellent writing, editing, and oral communication skills with strong organizational and critical thinking skills

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- Ability to explain complex technical information effectively to diverse groups
- Proficient in standard MS Office applications including MS Excel, MS Word, and MS PowerPoint
- Ability to work harmoniously as team member, adapt to diverse educational and cultural backgrounds maintaining a high standard of personal conduct

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APPENDIX 9

A. Contingency Plan for Emergency Disaster Management (draft)

1. The contingency plan for emergency disaster management (EDM) will ensure that necessary and appropriate actions are taken to protect people and property from the consequences of emergencies and disasters that may take place suddenly or develop slowly. The Emergency Management Plan (EmMP)[91] might serve as an executive document for responding to emergency situations that are of such magnitude as to cause a significant disruption to normal operations in all areas or portions of BAU campus.

2. However, the following sections provide a more detailed plan as part of the feasibility study. It is to be noted that this contingency plan for EDM only covers the proposed new buildings for BICAR, HCDI and the Interdisciplinary Institute for Food Safety (IIFS) and not the entire BAU campus. BAU needs to prepare a comprehensive EDM plan of its own which should cover the project structures as well as existing buildings in an integrated way. The draft emergency response plan presented here will be more detailed and finalized by BAU based on their requirements. BAU has the capability and expertise in finalizing the emergency and disaster response plan. The Department of Environment Science oversees its disaster management planning in BAU.

3. **Country legal frameworks that will guide this EDM contingency plan**. The proposed EDM contingency plan here is guided by the country's legal framework and plans. The following are legal planning documents that will be considered during the development of the proposed EDM plan:

(i) the Bangladesh National Building Code (BNBC) which covers the fire response plan, earthquake response plan, emergency action plan, etc. The proposed buildings' designs will be prepared following the BNBC 2020. For each constructed building, the emergency response plans mentioned earlier will be developed for the specific geographical locations.

(ii) the National Plan for Disaster Management (2021-2025) (NPDM) prepared by the Government will be also considered in the EDM plan. The purpose of NPDM 2021-2025 is to guide the implementation of the Disaster Management Act 2012 and Standing Orders on Disaster 2019, allowing Ministries/Department of the Government and other agencies to use it in preparing their Annual Work Plans. The plan takes a 'whole-of-society' approach for effective implementation.

(iii) the Disaster Management (DM) Act 2012 is the legal framework for Disaster Risk Management (DRM) in the country. The National Disaster Management Council (NDMC), headed by the Prime Minister, is the supreme body for providing overall direction for DRM, with the MODMR having the role of "Secretariat" to NDMC. NPDM 2021-2025 is prepared to achieve national long-term DRM goals in line with the DM Act 2012, Bangladesh Delta Plan 2100 and 8th Five Year Plan. NPDM 2021-2025 is the Government's 'white paper' document and abides by the national DRM institutional and policy regimes. It embodies both rapid and slow onset disasters and it also includes recurrent, anticipated and climate induced disasters.

4. **The EDM contingency plan (EDMCP)**. In developing this EDM contingency plan for the project, BAU aims to act in the interest of safety and security needs of all staff and

[91] An EmMP is usually consists of five parts: (i) Prevention; (ii) Preparedness; (iii) Response; (iv) Recovery and (v) Mitigation.

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students, protecting lives and property through effective use of university and community resources.

5. This EDMCP is intended to serve as a framework for coordinating efforts by senior management and operational staff of BAU who the primary responders in the event of will be any emergency. The relevant staff should have a clear understanding of what they are supposed to do and what others will be doing. These staff will form a team of emergency management who will address four main areas of concern, namely: (i) reducing risks and hazards, (ii) preparing resources to respond to any emergency, (iii) responding to the actual emergency event, such as dealing with damage caused by the hazard and limiting further damage, and (iv) returning to its original functional state (or as close as possible to this state) before the incident.

6. BAU will identify and create its own emergency management organizational structure, an emergency communications system, identify the emergency levels, and the roles and responsibilities of BAU representatives, and the required internal and external coordination procedures. The emergency response and disaster preparedness plan will be developed accommodating persons with impaired vision, hearing limitations, and mobility challenges. BAU will coordinate with the City Corporation Disaster Management Committee and the Divisional Disaster Management Committee in Mymensingh in finalizing the details of the plan. Information dissemination of the plan within BAU will be conducted regularly to make sure that everyone is aware of the staff assigned for coordination, and procedures to be followed in case of emergency or disaster.

7. **Nature of emergencies**. For BAU campus, incidents or emergencies may be considered in two broad categories, which sometimes overlap, namely, 'crises of person' and 'crises of property'. Some possibilities based on the geographic location, political situation and demographics are provided in Table 7. Incidents or emergencies may also be considered in terms of their extent, namely, isolated or major incidents/disasters. In case of major incidents/disasters, outside emergency services as well as major efforts by the Emergency Response Group (ERG) would be required, and the Management Team (Senior Management and Academic Leadership Forum) would activate major policy considerations and decisions.

Table 7: Types of incidents or emergencies that might occur at BAU campus

Crises of Person	Crises of Property
Injury/death	Fire
Epidemics (infectious diseases)	Extreme hot days
	Loss of water, power, sewage or IT services

Source: TA consultants.

8. An isolated incident may not require management intervention but would involve selected members of the ERG, as required. A few BAU specific examples are provided in Table 8.

Table 8: Types of isolated incidents that may occur at BAU campus

Isolated Incident	Major Incident/Disaster
An event that impacts a small part of the community or physical property, not affecting its overall functioning capacity	An event that causes extensive damage and seriously impairs or disrupts overall functioning capacity
Small, localized fire	Major fire
Isolated power outage	Severe storm
Small localized hazardous material spill	Major earthquake
	Flooding event (BAU campus is usually flood free). However, BAU campus is in a region highly vulnerable to flooding from the River Brahmaputra.

Source: TA consultants.

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9. The list of examples above is not exhaustive, and there may be some incidents that do not require a significant level of response. Note also that although an isolated incident may be considered small or insignificant, it is by no means to be taken lightly. Immediate attention must be given to mitigate the situation as quickly as possible. The priority is the safety of all individuals involved, including the safety of individuals directly affected by the incident and the safety of individuals within the BAU campus.

10. **General guidelines regarding emergency planning**. The following assumptions are made regarding emergencies, and should be used as general guidelines for the EDMCP:

- An emergency or disaster may occur at any time of the day, night, weekend, or holiday, with little or no warning.
- The succession of events in an emergency or disaster is not predictable; therefore, published operational plans, such as this manual, should serve only as a guide and a checklist, and may require field modifications in order to meet the requirements of the emergency.
- A major emergency/disaster may be declared if the information indicates that such conditions are developing or probable.
- BAU-wide disasters may affect the entire city of Mymensingh, and regional emergency services may not be available to assist, particularly for the first day or two. The worse the disaster, the more BAU staff and students will be left on its own. Ideally, therefore, BAU must be prepared to be totally self-sufficient in the event of an emergency or disaster.

11. **Emergency management**. In the event of an emergency coming to the attention of the Campus Protection Unit (CPU),[92] the CPU shift supervisor shall follow the CPU standard operating procedures. If an emergency is warranted, the shift supervisor shall communicate immediately with the CPU duty officer. Depending on the magnitude of the incident, the duty officer would contact the CPU manager or designee, who would then communicate with the Director Planning and Development of BAU, or designee. The Director of Planning and Development, with the proper permission of the Chair of the Emergency Response Committee (most likely to be the Vice Chancellor), if necessary, will declare an emergency, and notify all members of the Emergency Management Team.

12. **Emergency management team.** It is essential that members of BAU senior management recognize their ultimate responsibility about planning their response to incidents and providing appropriate guidance and support to members of the BAU community during and after emergency situations, to protect their safety and security needs. The Management Team (Senior Management and Academic Leadership Forum) is formed for this purpose and should meet at least once a year to review procedures and update the Emergency Management Plan where necessary. The team should also conduct post-incident meetings to evaluate the effectiveness of the emergency management procedures.

13. **Structure of emergency management team**. It is important that the same team of people is responsible for handling any incidents that may arise at BAU. This means that BAU deals consistently and procedurally with incidents and that as little pressure as possible is placed on people who are dealing with the emergency – particularly those who have not previously dealt with these types of emergency situations. The Management Team (Senior Management and Academic Leadership Forum) includes but is not limited to:

[92] There is one CPU at BAU, which is operated by Campus Police. This unit can be revamped to fit for Emergency Response.

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- Vice-Chancellor
- Pro Vice-Chancellor
- Director: Planning and Development
- Chief Engineer
- Nominee: Finance committee (usually treasurer)
- Director, Public Relations & Publications
- Principal Instrument Engineer
- Chief Medical Officer
- Director, Transport
- Director, central Security
- Director: ICT Cell
- Students' Affairs Adviser
- Deans of Faculties

14. The specific responsibilities of these committee members can be outlined by the BAU committee for emergency planning while preparing the detailed emergency response Plan. The emergency management and response network are outlined in **Error! Reference source not found.**.

15. **EMERGENCY RESPONSE PLAN (ERP)** In this section, the ERP is formulated and supervised by the EMT. Consideration is given to the responsibilities of the operational arm, the Emergency Response Group (ERG). This provides detailed information on response operations and should not be confused with a simple set of standing instructions issued to members of the wider BAU community outlining what to do in an emergency.

16. **Emergency Control Center.** The CPU of BAU shall serve as the Emergency Control Center – the emergency management "headquarters" for the BAU ERG. Members of the Management Team should maintain contact with this control center. Should circumstances require that the Emergency Control Center needs to be located elsewhere, this decision will be made by the Emergency Manager (in charge, which should be nominated by the EMT), and communicated accordingly.

17. **Emergency Response Group (ERG).** The ERG will be comprised primarily of Infrastructure and Operations Department staff, and specific individuals in various BAU buildings. This includes but should not be limited to:

- Campus protection unit
- Building and space maintenance (planning and development unit headed by the director)
- Electrical section (headed by the chief engineer)
- ICT cell (headed by the director)

18. **ERG preparedness plans.** The ERG should prepare their own preparedness plans to counteract emergency situations. The following preparedness plans should be formed by each member of the ERG.

19. **Emergency manager.** The Emergency Manager appointed or nominated by the EMT will direct and coordinate the specific campus-wide response activities and campus support operations during a major emergency or disaster. In his/her absence, the Manager of CPU will serve as Emergency Manager. Depending upon the type of emergency or disaster, the Emergency Manager will direct appropriate BAU employees to assist the Mymensingh Police Services, Fire Department (located at Digharkanda, 1.5 km from the BAU campus), and local ambulance service (including BAU's own medical station ambulance) during and/or after the emergency or disaster.

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20. **Emergency preparedness plans for Heads of Departments.** Every head of the department, in collaboration with or on behalf of their respective Dean, will form plans for emergency preparedness in the following manner:

a. Appoint/nominate a Building Emergency Coordinator for every building in which his/her department has an activity and Building Emergency Coordinator Assistants (also known as a 'floor marshals', 'floor monitors' or 'incident officers') for each floor or area of the building.
b. Work with the Building Emergency Coordinator in developing building-specific evacuation guidelines and designated primary and alternative Emergency Assembly Points.
c. Provide the Safety, Health & Environmental Officer with the names, titles and phone numbers of their designated Emergency Response Support personnel (Building Emergency Coordinators and assistants; first aiders; elementary fire fighters), and also notifying him/her of any changes that occur subsequent to their designation.
d. Ensure that these personnel receive appropriate on-the-job training during normal working hours. This training is the responsibility of relevant members of the ERG and includes, but is not limited to, the teaching of emergency techniques (such as use of fire extinguisher and standpipe fire hoses), fire drills and use of emergency exits.
e. Ensure that employees and/or students in his/her department or area of responsibility are provided with general information concerning BAU emergency procedures, as well as information such as building-specific evacuation procedures and Emergency Assembly Points.

21. **First Aids**. All areas of campus should have qualified first aiders. They can be students and teacher volunteers. Their preparedness plan should be as follows:

- In collaboration with the BAU Safety, Health and Environmental Officer and their respective managers/heads of department, undergo training at an accredited training provider. The EMT will assess and contact a proper accredited training provider for this.
- Be familiar with the location of a first aid kit in their building or area, in collaboration with their respective heads of department.
- Ensure that their on-campus contact details are current and correct.

22. **Communications**. The ability to communicate instructions during an emergency is key to the effectiveness of executing the Emergency Management Plan – based on the Emergency Management and Response Network (see **Error! Reference source not found.**). Communicating accurate and sufficiently detailed information is a challenge. In general, alarms should alert everyone to conduct an evacuation. Although detailed information (fire, earthquake, etc.) cannot be communicated, the basic advice to evacuate is communicated.

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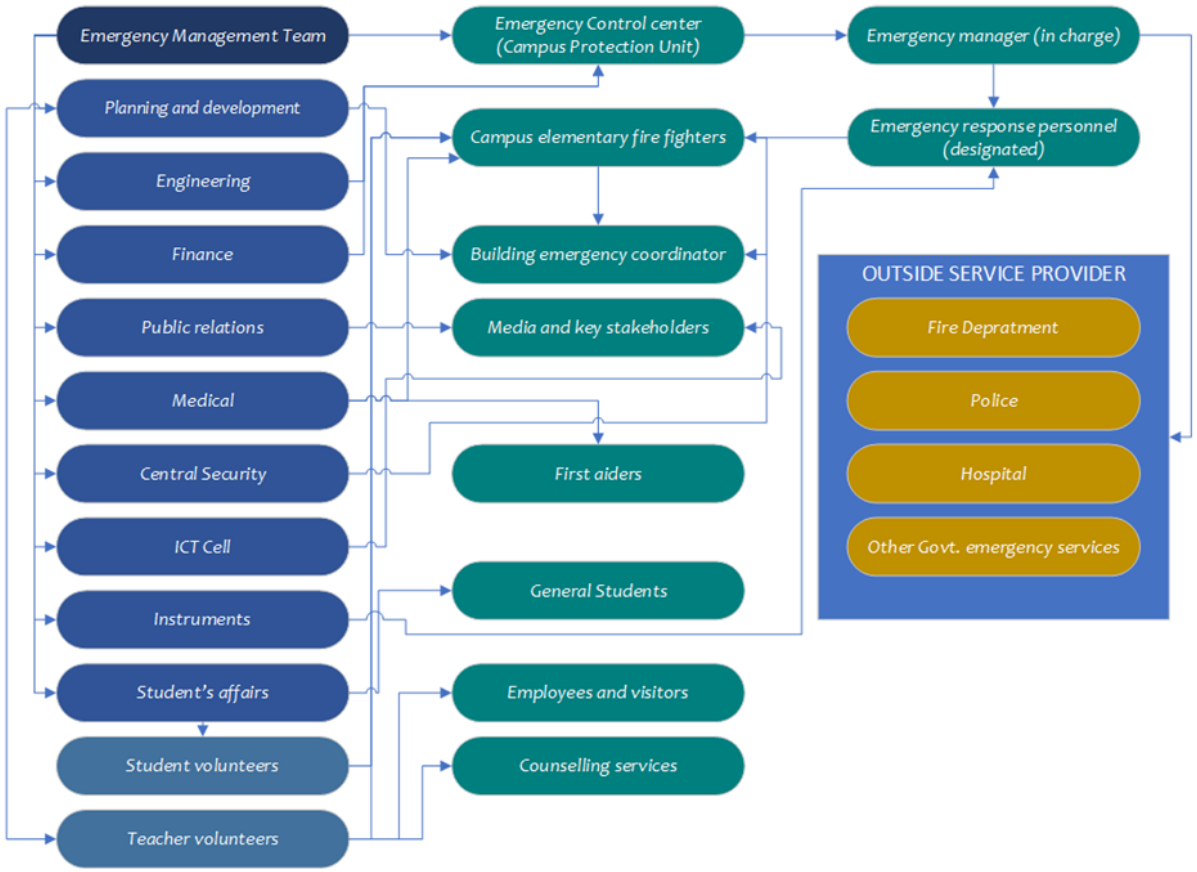


Figure 1: Emergency Management and Response Network

23. **ICT cell.** The ICT cell is responsible for BAU's information telecommunications and Internet. The ICT cell should have the following emergency preparedness plan regarding emergencies which may lead to impacts on the communications channels of BAU:

- Maintaining the batteries of 'campus sector distribution facilities' UPS equipment – which provide backup power for approximately 2-3 hours.
- Maintain standby generators – which supply redundancy to core facilities, namely, the BAU website and telephones (in CPU and other key offices).
- Maintain content of the BAU emergency web page

B. EVACUATION PLAN

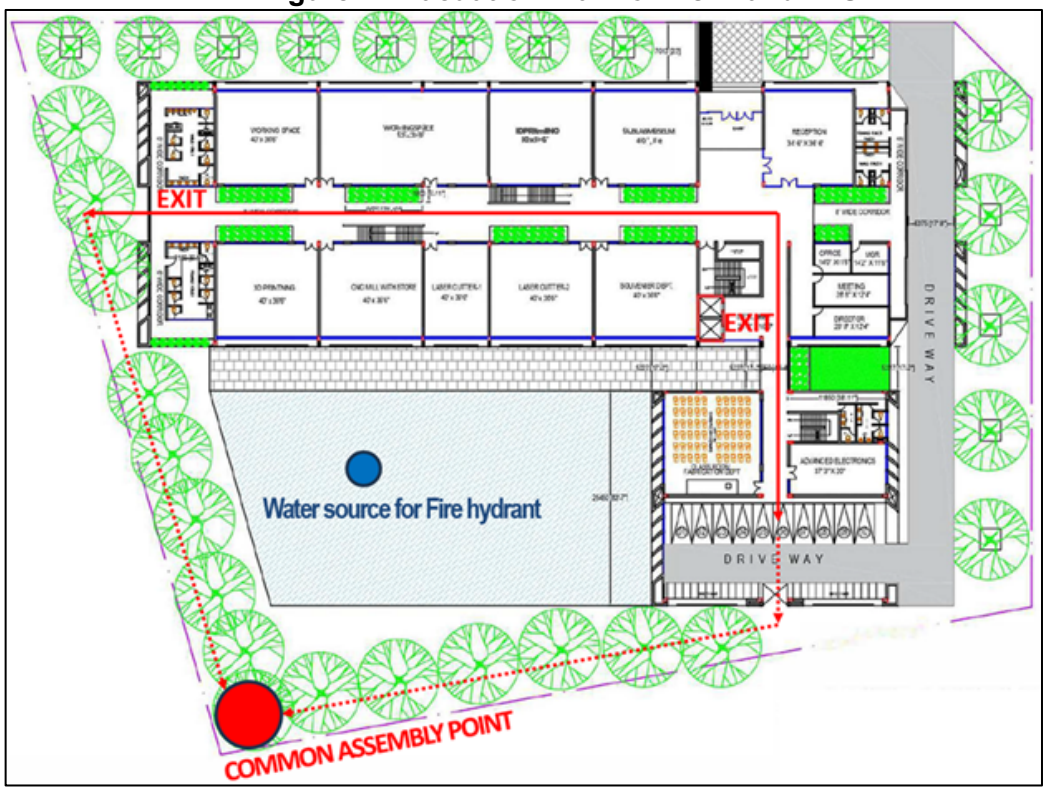
24. ***Building evacuation.*** Building evacuation is required when it is no longer safe or potentially unsafe to remain inside a building. The building evacuation plan is needed for fire, earthquake **emergencies**, and hazardous chemical spill or pathogen outbreak. The building evacuation plan will be prepared for the (i) examination hall; (ii) Research, Innovation & Incubation Center and (iii) char and haor department, IIFS department and fabrication laboratory at BAU. The template can be used for other buildings within the campus. The procedure will be based on the FIRE-GEAR evacuation templates below and would take place as follows:

1. An evacuation will occur when the fire alarm sounds and/or notification is received by the CPU, the relevant Building Emergency Coordinator, the BAU Fire Department (and local Digharkanda Fire department), or the Mymensingh Police Service.

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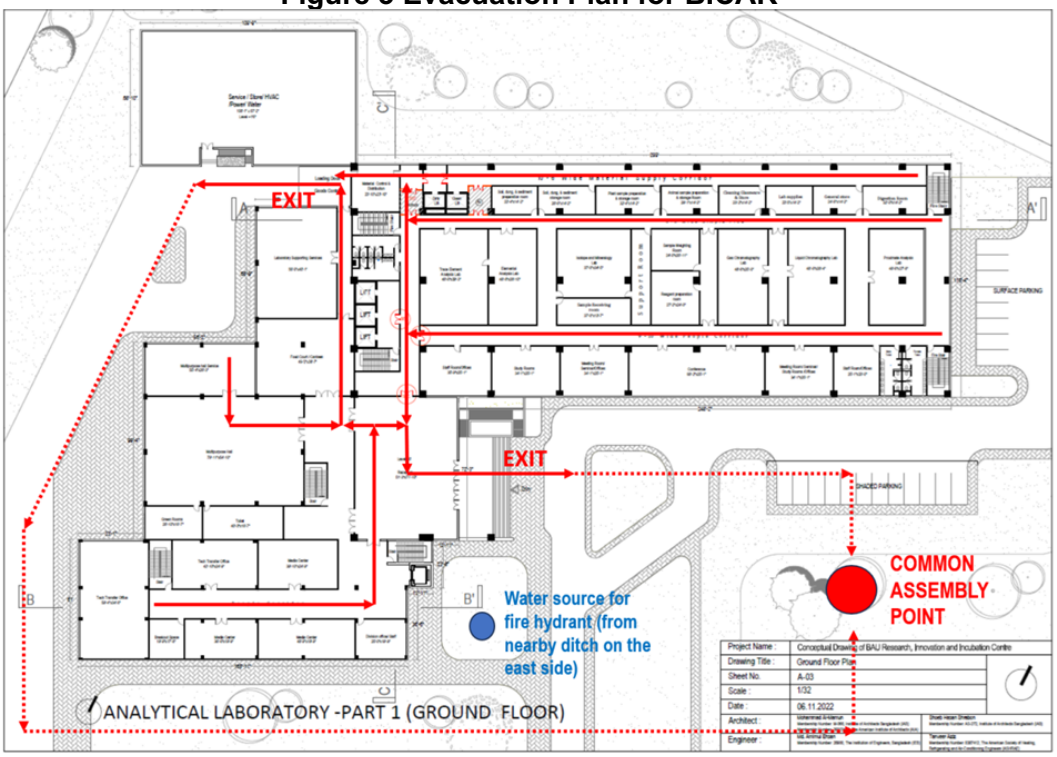
2. Building occupants must leave the building by the nearest marked exit and alert others to do the same.
3. Individuals with mobility, hearing or sight challenges should be assisted in exiting the building.
4. Elevators should not be used to evacuate the building. Diagrams showing evacuation routes should be mounted on the passage walls on each floor.
5. Once outside the building, individuals should proceed to the designated Emergency Assembly Point. Streets, fire lanes, hydrants, and walkways should be kept clear for emergency vehicles and personnel.
6. The relevant Building Emergency Coordinator will take a role at the designated Emergency Assembly Point to check if all occupants have exited the building.
7. Occupants should not return to the building until directed to do so by CPU (via the Building Emergency Coordinator or Head of Department, whichever is appropriate).

Figure 2 Evacuation Plan for HCDI and IIFS



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Figure 3 Evacuation Plan for BICAR



25. ***FIRE-GEAR evacuation template*** Heads of all Departments in the building or in-charge (for exam hall) for the proposed buildings/facilities should work with their Building Emergency Coordinators in making use of the FIRE-GEAR evacuation template (see next section) to develop a building-specific emergency evacuation procedure, which should be on all notice boards. Details of the Building Emergency Coordinator and assistants should be placed on all noticeboards. See example below:

Emergency Coordinator: Name Surname - BAU ext 0000 or cell 000 000 0000			
Building/floor area	**Floor marshal/monitor/ incident officer**	**Deputy**	**Assembly Point: (1. Primary, 2. Secondary)**
Ground floor	xxx BAU ext. 0000 Cell: 00000000	xxx BAU ext. 0000 Cell: 00000000	1. lawn of health research center 2. Isha khan Hall field
xxx	xxx	xxx	xxx

26. It is advisable (not compulsory) to list all fire-fighting equipment in the building. The advantage of doing this is that management is better able to monitor any theft or misuse of equipment. See example below:

Location of fire-fighting equipment		
Area/Floor	Location	Type
Ground floor	Main gate entrance	Fire hose
Ground floor	Opposite to room 022	Fire extinguisher
xxx	xxx	xxx

27. The following template **can** be used on notice board in case of fire emergency. It is to be noted that most disasters that are possible at BAU, for instance earthquake, fire, hazardous spills and laboratory blast, can start with fire.

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F	FIND the fire	If you see or smell smoke, immediately find out **where** it is.
I	INFORM the others	**Warn** occupants as soon as possible! - Alarm may be automatic / manual / repeated blasts of whistle
R	REPORT to emergency services	Call **CPU EMERGENCY** ext. 0000 (or 0000) as soon as possible. - Provide the following info: Building + Department / floor where the fire is + your name. - CPU will contact local (e.g., Digharkanda) Fire and Rescue Services - Call your Building Emergency Coordinator if possible. - NEVER TRY to CONTROL a FIRE BEFORE ALERTING CPU.
E	EXTINGUISH fire if safe to do so	Use firefighting equipment to control the fire, ONLY if: - It is small enough to be contained, and - You know how to operate the extinguisher (pull out the pin!) - AVOID BEING TRAPPED: place yourself between the fire and an EXIT.
G	GET GOING	Even if a fire extinguisher is being used, make sure everyone starts evacuating. - IF the FIRE CANNOT be CONTROLLED SAFELY, LEAVE IMMEDIATELY
E	EVACUATE	Evacuate the building in an orderly manner. DO NOT PANIC: - Check that all occupants leave the building. - Assist anyone with mobility / hearing / sight challenges. - Follow EXIT signs and alert others to do the same. - If there is THICK SMOKE, keep AS LOW AS POSSIBLE, or CRAWL.
A	ASSEMBLE outside	Get all occupants to go the Assembly Point: - Keep clear of the building. - Building Emergency Coordinator take roll call. - DO NOT OBSTRUCT emergency vehicles and personnel
R	RETURN only when instructed	Only return to the building once directed to do so by the personnel in charge of the CPU

28. **HAZARDOUS MATERIAL INCIDENT (Bio-safety Level - 3 laboratory incidents).** BAU has proposed a Bio-safety Level – 3 laboratory for BICAR. The laboratory will have two floors of it. Biosafety level 3 (BSL-3) is applicable to clinical, diagnostic, teaching, research, or production facilities where work is performed with agents that may cause serious or potentially lethal disease through inhalation, to the personnel, and may contaminate the environment. It requires that laboratory personnel receive specific training in handling pathogenic and potentially lethal agents and be supervised by scientists competent in handling infectious agents and associated procedures. All work is performed in bio-contained environments using appropriate engineering controls.

29. The proposed BSL-3 laboratory will be used for vaccine research, hence should use the following protective measures;[93]

(i) **Personnel decontamination:** As a primary practice, the first step should be protective clothing (outer scrubs/apron removal) followed by washing of hands and other exposed areas with 0.5 per cent solution or intermediate detergent solution. Any kind of splashes on the body of personnel should be immediately treated with enough water from a nearby eye-wash station. For large

[93] Mourya DT, Yadav PD, Majumdar TD, Chauhan DS, Katoch VM. Establishment of Biosafety Level-3 (BSL-3) laboratory: important criteria to consider while designing, constructing, commissioning & operating the facility in Indian setting. Indian J Med Res. 2014 Aug;140(2):171-83. PMID: 25297350; PMCID: PMC4216491.

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quantities of spill/splashes on skin or clothing, an emergency body shower with disinfectant soap and water is to be utilized immediately.

(ii) **Solid waste disposal:** Solid biomedical waste generated from laboratories which includes gloves, soiled gauze pads, cotton, etc. should be soaked in 2.5 per cent solution of sodium hypochlorite and 0.25N NaOH for 16 h or more. Also, if the laboratory has an autoclave facility, the biohazardous laboratory waste should be autoclaved at 121°C at 15 pounds per square inch (psi) pressure for 20 minutes for complete decontamination. It can then be disposed of in accordance with the requirements of the DOE according to ECR 2023 and the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials (2019).

(iii) **Liquid effluents:** Toxic liquid effluents generated from the BSL-3 laboratories should be decontaminated with a 1:1 (v/v) mixture of 2.5 per cent sodium hypochlorite and 0.25N NaOH, mixed well and kept for 8 h. Also, if the laboratory has an autoclave facility, the liquid effluent can be autoclaved at 121°C at 15 psi pressure for 20 min through a specific liquid cycle in the autoclave. This decontaminated effluent can then be disposed of in accordance with the requirements of ECR 2023 and the Bangladesh Biosafety and Biosecurity Guidelines for Handling and Disposal of Biohazardous Materials (2019).

(iv) **Equipment/Work surfaces:** For most toxins and chemicals, 0.5 per cent sodium hypochlorite solution is an effective decontaminant. Additionally, one should read carefully the Material Safety Data Sheet (MSDS) for the appropriate decontaminant for a particular toxin/chemical used.

(v) **Glassware:** All the contaminated glass wares should be soaked in a mixture of 2.5 per cent sodium hypochlorite and 0.25N NaOH solution for 8 h. Alternatively, glass wares can also be soaked in 5 per cent sodium hypochlorite solution for 8 hours.

30. **Operation and maintenance of BSL-3 laboratory:** After completion of validation procedure and acquiring certificate to use the facility, it goes in safe running operation mode. The major maintenance requires re-review of the contingency plan for emergencies during regular operation mode, so that any possible failure of any ongoing controls can be handled without breaching biosafety such as BMS, UPS, DG set and autoclaves. In case of non-sustainability of emergency, contingency plan for exit should be evolved. Annual Maintenance Contracts (AMC) of all important equipment should be done in advance to ensure continuity of routine maintenance. A memorandum of understanding should be signed with the contractor and sub-contractors for providing support for at least five years for the spares and services as and when needed. Maintenance plays an important role in keeping the BSL-3 laboratory equipment and systems reliable (**Error! Reference source not found.**).[94]

31. **Emergency procedure of BSL-3 laboratory.**[95] Finalizing the emergency procedures will refer to the guidelines of the WHO. Other than fire or earthquake incidents along with power failure, the BSL-3 laboratory can experience major disaster in the form of chemical or micro-organism spills. The following guidelines will be used for response to spills of BSL-3 material outside of the biosafety cabinet or any other incident that may have generated an aerosol in the containment laboratory such as failure of physical containment devices during centrifugation;[96]

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[94] Laboratory design and maintenance. Geneva: World Health Organization; 2020 (Laboratory biosafety manual, fourth edition and associated monographs). Licence: CC BY-NC-SA 3.0 IGO.

[95] WHO. Laboratory Biosafety Manual, Fourth Edition. 2020. https://iris.who.int/bitstream/handle/10665/337956/9789240011311-eng.pdf?sequence=1.

[96] Yale Environment Health and Safety: Emergency Procedure. Available online at: https://ehs.yale.edu/sites/default/files/files/Emergency-Procedures/BSL3-Spill.pdf date accessed: 22 July 2023.

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- Hold your breath and leave the room immediately. Notify others in the room to evacuate immediately.
- Quickly remove outer gloves before leaving and drop gloves on floor before entering the ante room.
- Remove personal protective equipment in the airlock or access zone. Turn potentially contaminated clothing inward. Remove gloves last and wash any exposed skin areas with antiseptic soap and warm water.

32. In the event of an exposure incident:
- For a needlestick/puncture wound: Wash the affected area with disinfectant, antiseptic soaps and warm water for 15 minutes. Squeeze around the area to encourage the flow of blood out of wound.
- For mucous membrane exposure: Use eye wash for 15 minutes to flush the affected area.
- Post a Biohazard Spill Sign at the entry to BSL-3 lab door with the recorded date and time of spill.
- Notify your Principal Investigator and Environmental Health and Safety officer.
- Do not re-enter the laboratory until it has been cleared for re-entry by the Principal Investigator or Environmental Health and Safety. In general, a period of at least 30 minutes should be allowed before cleanup is attempted, but the time is contingent upon the supply and exhaust features of the lab.

33. ***Composition of BSL-3*** **Spill** ***Kit.***
- Undiluted household bleach
- Forceps for handling sharps or collecting small objects
- Paper towels or other suitable absorbent
- Biohazard bags for the collection of contaminated spill cleanup items
- Sharps container, if necessary, for collection of needles or other sharps
- Personal protective equipment: Gloves (household utility gloves afford additional protection), face protection such as masks and eyewear, back-fastening gowns, Tyvek jump suits (will not drag into spill area when cleaning), plastic booties and a powered-air-purifying-respirator (PAPR) with HEPA filters.

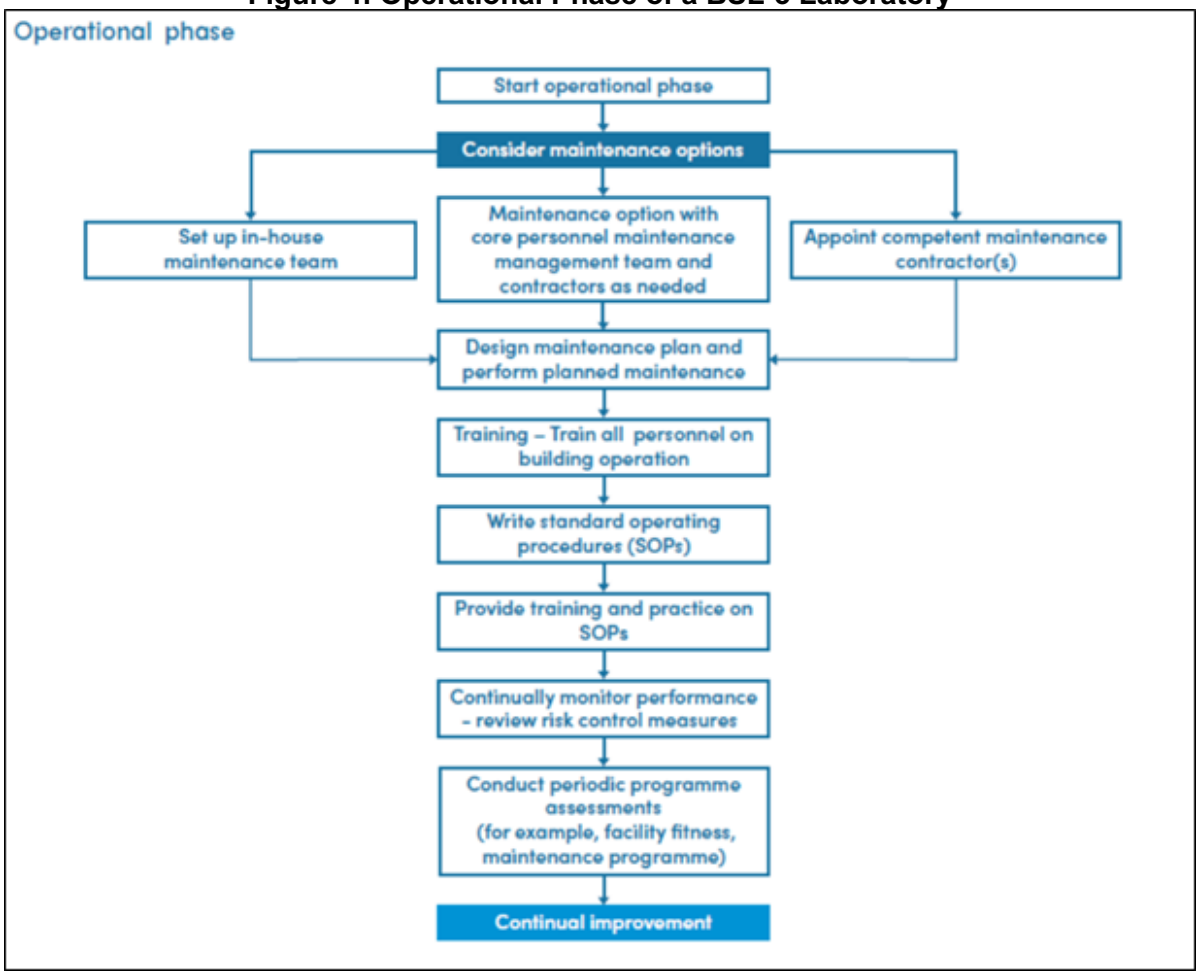
34. ***Cleaning the BSL-3*** **Spill.** Once clearance has been given to re-enter the spill area by the Principal Investigator in consultation with Environmental Health and Safety Officer, wear the appropriate personal protective equipment and enter the lab.
- While wearing personal protective equipment, cover the spill area with paper towels or disinfectant- soaked paper towels.
- Slowly pour concentrated disinfectant around the edge of the spill, working toward the center to avoid enlarging the contaminated area). Avoid splashing or the creation of aerosols during this step.
- Allow a 15-20-minute contact time for the disinfectant.
- While waiting, decontaminate the surrounding floor and work surface areas where splashes or larger aerosols may have settled around the spill. Use disinfectant-soaked towels to wipe these areas (1-10 percent household bleach is suitable for this purpose).
- After the 15-20-minute contact time, place soiled paper towels inside the biohazard bag.
- Repeat the decontamination procedure.

35. ***After Performing the*** **Decontamination**

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- Decontaminate any reusable items such as forceps by wiping with and then soaking in a disinfectant solution. Soaking in 1-10 percent household bleach for 15-20 minutes is sufficient. Since bleach is corrosive, follow the decontamination with a water wipe to remove any corrosive residues.
- Remove personal protective equipment, turn any exposed areas inward and place in the biohazard bag. Generally, gloves are removed last. However, to avoid touching your face with gloved hands, remove gloves just before removing masks or eyewear.
- Wipe down the exterior portions of any reusable personal protective equipment such as the powered-air-purifying-respirator and utility gloves with bleach solution. Perform the disinfectant wipe down twice.
- Wash your hands well with soap and water for at least 15-30 seconds.
- Autoclave all waste generated from the spill cleanup. Use fresh gloves for transport to the autoclave and wash hands after removing gloves.

Figure 4: Operational Phase of a BSL-3 Laboratory



36. **HEAT: Emergency Preparedness Plan.**[97] An extreme heat event is a series of hot days, much hotter than average for a particular time and place. Extreme heat is deadly and kills more people than any other weather event. Climate change is making extreme heat events more frequent, more severe and last longer.

[97] This plan is Based on (i) Ready.gov An official website of the U.S. Department of Homeland Security. URL: https://www.ready.gov/ ; (ii) American Red Cross – Extreme Heat Safety. URL: https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/extreme-heat-safety.html.

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37. **Building construction strategies.** (i) Weather-strip doors and windows; (ii) Use window reflectors specifically designed to reflect heat back outside: (iii) Add insulation to keep the heat out; (iv) Use a powered attic ventilator, or attic fan, to regulate the heat level of a building's attic by clearing out hot air; (v) Install window air conditioners and insulate around them.

38. **Staying hydrated.** During hot summer days, especially when projected around April-June at BAU campus, the following tips and advice should be posted at the target buildings and BAU website: (i) Drinking enough water is the only way to prevent heat illness. An average person needs to drink about 3-4 liters of water daily. Everyone's needs may vary; (ii) Checking if the body is getting enough water can be noted by urine color. Dark yellow may indicate that a person is not drinking enough; (iii) Do not rely on a fan as your primary cooling device. Fans create air flow and a false sense of comfort, but do not reduce body temperature or prevent heat-related illnesses; (iv) Identify places in your community where you can go to get cool such as libraries and shopping malls or contact your local health department to find a cooling center in your area; (v) Cover windows with drapes or shades; (vi) Avoid sugary, caffeinated and alcoholic drinks; (vii) If you are sweating a lot, combine water with snacks or a sports drink to replace the salt and minerals you lose in sweat; (viii) Talk to your doctor about how to prepare if you have a medical condition or are taking medicines.

39. **Gather Emergency Supplies.** Gather food, water and medicine. Stores might be closed. Organize supplies into a Go-Kit and a Stay-at-Home Kit. In the event of a power outage, you may lose access to clean drinking water. Set aside at least 4 liters of drinking water per person per day. Consider adding drinks with electrolytes. Include sunscreen and wide-brimmed hats.

40. **Make a Plan to Stay Cool.** Do not rely only on electric fans during extreme heat. When temperatures are in the high 30s (exceeding 35), fans may not prevent heat-related illness. Taking a cool shower or bath or moving to an air-conditioned place is a much better way to cool off. Move to air-conditioned libraries or classrooms within BAU campus. Spending a few hours each day in air conditioning can help prevent heat illness. Make sure you have plenty of lightweight, loose clothing to wear.

41. **Learn Emergency Skills.** Learn how to recognize and respond to heat illness. Learn First Aid and CPR. Be ready to live without power. Utilities may be offline. Be ready to live without power, gas and water. Plan for your electrical needs, including cell phones and medical equipment. Talk to your campus doctor. Plan for backup power.

PANDEMIC: Emergency Preparedness Plan

- Develop a continuity of operations plan for maintaining the essential operations of the University including payroll; ongoing communication with employees, students and families; security; maintenance; as well as housekeeping and food service for the residential system.
- Establish a pandemic plan for campus-based healthcare facilities that addresses issues unique to educational settings.
- Identify a pandemic coordinator and response team (including the Health Care Centre, Counselling Centre, Provosts, CPU, Public relations Division, Director of Planning and Finance, Deans, Director of Students affairs, academic staff and student representatives) with defined roles and responsibilities for preparedness, response, and recovery planning.
- Delineate accountability and responsibility as well as resources for key stakeholders engaged in planning and executing specific components of the

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operational plan. Ensure that the plan includes timelines, deliverables, and performance measures.
- Ensure that pandemic planning is consistent with any existing University emergency operations plan and is coordinated with the provincial and national Departments of Health and Education.
- Work with the local Department of Health to discuss an operational plan for rollout of healthcare and other health and social services to meet the needs of the University and community during and after a pandemic (surge capacity). Ensure they have identified critical supplies needed to support a surge in demand and take steps to have those supplies on hand.
- Implement an exercise/drill to test your plan and revise it regularly.
- Develop a recovery plan to deal with consequences of the pandemic (e.g., loss of students, loss of staff, financial and operational disruption).
- Share what you have learned from developing your preparedness and response plan with other universities to improve community response efforts.

42. The emergency preparedness plan for pandemics like COVID-19 needs more attention and regular updating of plans. The following lessons have been learnt during last COVID-19 outbreak at Bangladesh:

- **Lack of emergency plan.** There was no emergency preparedness and response plan to combat a worldwide pandemic like COVID-19 at any institutional level in Bangladesh.

43. However, the World Health Organization (WHO) has warned the world that COVID-19 may not be the last of the pandemic the human civilization has experienced. Hence it is of utmost importance to develop emergency preparedness and response plans to such pandemics. BAU needs to develop its plan in this regard which should coordinate in-campus activities as well as connected to the country level health and education system. It has been observed that, once emergency management plans are developed and agreed upon, they are frequently stored away and rarely revisited. Instead, these plans should be more frequently practiced and become flexible, living documents that align with evolving operations.

- **False sense of confidence based on experiences with earlier outbreaks.** Prior to COVID-19, there was not much emphasis placed on contagion response. Pandemics are very rare, and we have no recent experience with an overwhelming outbreak of this fashion.

44. **Preparedness for future pandemic.**[98]

- **Proactive resource management.** Usually healthcare systems function with "just-in-time" supply chains. Based on the experience of COVID-19, BAU medical facilities (i.e., Campus Medical Center) should take time to identify and activate supply streams, review stockpile levels, and rotate supplies to avoid expiring items.
- **PPE management.** The BAU medical facility needs better command and control for PPE. The medical center should spend a lot of time on training about how to use PPE, then must retool when new PPE is substituted.
- **Involving stakeholders in planning.** It is crucial to involve all departments and decision-makers in emergency preparedness planning and recovery

[98] Based on: Cheney, C. (2020). How to Improve Emergency Preparedness for Pandemics. Healthcare leaders. August 2020. Available at: https://www.healthleadersmedia.com/clinical-care/how-improve-emergency-preparedness-pandemics

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efforts. Involving frontline clinicians in planning improves understanding of their experience during an emergency, helps with engagement and adoption of new processes, and gives medical professionals a vested interest in emergency preparedness rather than just telling them what to do.

FLOODING: Emergency Response Plan

45. BAU campus is located over flood level and yet hasn't been reported for flooding. However, preparation is still needed in case of emergencies. Due to climate change, Brahmaputra river is increasingly becoming vulnerable to flooding. Therefore, a comprehensive planning to prepare for flooding is necessary under projected climate change. The following flood preparation plan is indicative and general. The BAU authority should develop a comprehensive campus specific plan for flood emergency.

- Prepare an evacuation plan for each building. Locate the flood shelter in advance and plan the route to the flood shelter.
- Warn students, teachers, and employees of flooding situations. Use the website of BAU.
- A topographic campus wide survey will prove valuable in flooding situation to warn campus dwellers to avoid specific places.

46. This section discusses how the services will be rendered from different utilities and responsible personnel during an emergency.

RESPONSES DURING EMERGENCY

Emergency Response Support

47. Several university personnel also play a role as the support arm during an emergency, including:

- Director, Planning and Development.
- Heads of Departments
- Building Emergency Coordinators (nominated by Director, Planning and Development)
- Building Emergency Coordinator assistants (also known as a 'floor marshals', 'floor monitors' or 'incident officers', nominated by Director, Planning and Development)
- Elementary fire fighters (campus based, with student, teachers and employee volunteers)
- First aiders (campus based, with student, teachers and employee volunteers)
- Health Care Centre staff
- Nominated Counselling Centre staff
- Public relations Division
- Engineering section

48. The following services will be rendered by utilities / personnel during an emergency:

49. **Heads of Departments (HOD).** Every HOD, in collaboration with their respective Emergency Response Support personnel, has the following general responsibilities in the event of an emergency:

- Informs all personnel under his or her direction of the emergency situation.

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- Informs staff and/or students in his/her department / area of responsibility of an emergency and, if appropriate, initiates emergency procedures.
- Assists students, staff, and other faculties in responding correctly to building evacuation guidelines and directs them to report to their designated Emergency Assembly Point.

50. **Building Emergency Coordinator** Emergency Response Support personnel, in collaboration with their respective managers or heads of department, have the following general responsibilities in the event of an emergency:

- When appropriate, take immediate action to contain emergency.
- Wear a reflective bib (kept in the emergency kit) for easy identification.
- Inform all employees of emergency condition.
- Where appropriate, distribute items in emergency kit.
- Where appropriate, direct qualified first aiders to persons in need.
- When a building is evacuated, take roll at the designated Emergency Assembly Point to check if all occupants have exited the building.
- From the emergency site, maintain radio or telephone contact with the Emergency Control Centre.
- Continues to disseminate status of emergency conditions to departmental personnel.

51. **First Aiders (medical staff and campus volunteers)** All areas of campus should have qualified first aiders. Their responsibilities are as follows:

- Respond to first aid emergencies as and where possible, following correct first aid procedures.
- Remain with the casualty until qualified medical personnel arrive on the scene.

52. **Health Care Centre.** The Health Care Centre has the following general responsibilities in the event of an emergency:

- Provide health care to staff or students, as needed.
- Liaise with the Director, Students Affair or Head of departments, employees of respective administrative departments
- Liaise with the Counselling Centre for psychological support services, and with outside service providers for advanced medical treatment, if required.

53. **Office of public relations.** Upon receiving notification of an emergency which may lead to media coverage, the Director of Public relations or designee will meet with all applicable University personnel to:

- Identify the emergency; try to determine as quickly as possible the seriousness of the situation.
- Keep in mind that rapidly changing situations, e.g., natural disasters or fires, may require frequent reassessments.
- Prepare an initial fact sheet and core messages as soon as sufficient details are available.
- The fact sheet will be prepared in consultation with those closest to the situation and should be analyzed to balance the public's right to know with privacy and security concerns.
- Working from the fact sheet, prepare core messages, a brief statement (and briefing document) that can be distributed to administrators, faculty, staff and offices that are likely to receive phone calls from stakeholders before more

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detailed information is available. Media enquiries should be directed to the Communication Team and/or Director of Public relations.

- Proactively distribute statements (and briefing documents) to administrators, faculty and staff, especially in offices that are likely to receive phone calls.
- Those answering the telephones should be instructed to obtain each caller's name, news media affiliation and telephone number and to note the time of each call. Calls generally will be returned in the order they are received.
- Identify key audiences.
- When feasible, faculty, staff and students will be addressed first, beginning with those closest to the occurrence. Immediate attention also may be required for persons related to those involved in the occurrence, such as parents or spouses. The news media and other external audiences should be considered next.
- Determine the best method of communication.
- A statement is prepared from the basic fact sheet with appropriate procedural and other information included for each audience.

54. **ICT Cell.** The ICT cell is responsible for the University's information telecommunications and Internet. The ICT cell has the following responsibilities with regard to emergencies which may lead to impacts on the University's communications channels:

- Assess nature of emergency and manage standby generator load balancing, refueling, etc., as required.
- Switch across to the University's emergency web page (currently there is no such page) based on decision by director of ICT cell.

55. **Engineering section** The chief engineer and his/her section have the following responsibilities in the event of a fire emergency:

- Upon notification, the chief engineer should go to the emergency scene to move any flammable gas bottles or other engineering equipment away from the site, if safe to do so.
- Return equipment to the site once it is safe to do so.

56. **Building Maintenance Section.** The in-charge of the Building Maintenance section has the following responsibilities in the event of a fire emergency:

- Upon notification, the in-charge of the Building Maintenance section should send personnel to the emergency scene to attend to locked doors or any other building infrastructure which may impede evacuation of personnel.
- Repair or replace damaged doors, locks and break glass boxes that may have been damaged during the fire emergency.

57. **Safety, Health and Environmental Officer (at CPU).** The Safety, Health and Environmental Office has the following responsibilities in the event of a fire emergency:

- Provide support, as required, to the Emergency Response Group.
- Liaise with the CPU and affected staff regarding details of the incident.

58. **Elementary Fire Fighters** BAU staff/students/teachers who have completed an Elementary Fire Fighting Course should wear a reflective bib that is provided in the emergency kit for easy identification. In the event of a fire, elementary fire fighters have the following responsibilities:

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- Only fight the fire if it is safe to do so. If it cannot be contained, follow your building-specific FIRE-GEAR evacuation procedure.
- Assist the Building Emergency Coordinator as required.
- Consider the safety of people first.

RECOVERY AFTER EMERGENCY

59. Recovery is the ability to return to a state of normal function with minimal suffering and disruption of services following a disaster. Disaster and financial assistance are examples of recovery that aids individuals and communities. Recovery assistance should be provided preliminarily by the BAU authority and secondarily by the local administration (i.e., Mymensingh City Corporation and respective government departments).

60. The aim of recovery will be to restore the affected BAU campus area to its previous state. It differs from response in its focus; recovery efforts are concerned with issues and decisions that must be made after immediate needs are addressed. Recovery efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure. Efforts should be made to "build back better", with a goal to reduce risks inherent in the campus community and infrastructures in question.

Phases of recovery (specifically to proposed buildings and facilities)

- **Search and Rescue.** In general, the initial search and rescue phase can last for hours or even days after the disaster. The time immediately following the event requires a fast response in order to save lives in imminent danger. Within a few days, that phase has usually passed, and the work turns toward providing support to the survivors. In the case of the proposed buildings, search and rescue should be operated for trapped staff, students and teachers and attract immediate attention of the medical unit.
- **Emergency medical treatment.** Meeting basic needs simply to keep people alive, the emergency relief phase begins in the immediate aftermath of a disastrous event. People need food, water, shelter, and medicines. Those with severe injuries need urgent medical help. After an initial assessment of the situation and the needs of affected staff, teachers and students, BAU emergency response team shall start working in alliance with the local private and government service provider.
- **Early recovery.** Immediately after search and rescue is finished, early recovery can start. At this phase damage assessment of the facilities, buildings etc. is done and electricity, gas and internet connections are restored.
- **Long term recovery.** This phase might involve mental support/counselling by certified medical staff for the staff, teachers and students to combat the trauma of disaster. Also, repairing of the facility, restoring all the equipment and better planning for future to tackle such disaster will be the priority of long-term recovery.

TIME OF RECOVERY: REQUIRED TIME FOR REHABILITATION AFTER A DISASTER

61. Given the geographic setting of Bangladesh, early recovery can last any number of weeks or months—even years. While the phases from relief to recovery may follow a similar pattern, the timeline for how quickly a particular community follows this path may depend on its initial vulnerability, access to resources, adaptability, and other considerations.

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62. The geographic location of the proposed site has vulnerabilities against some specific natural disasters such as earthquake and fire. Flooding is not common in the BAU site and cyclone is also not common in the area. An earthquake heavily affecting is among the more challenging disaster scenarios. Though do not commonly occur, the flood damage potential is increasing due to climate change, urbanization, growth of settlements in flood-prone areas and overreliance on flood control works such as levees and reservoirs. Disaster due to fire is also increasing at an alarming rate in Bangladesh.

63. Disaster Management in Bangladesh is guided by a number of national drivers including plans, policies, and orders. The National DM plans (NPDMs) look at the risks and consequences of disasters and community involvement and integration of structural and non-structural measures. The Disaster Management (DM) Policy (2015) places importance on financial resources for DM activities at all levels. The DM Act 2012 endorses the Standing Orders on Disaster (SOD) and provides a legal basis. The Ministry of Disaster Management and Relief (MoDMR) has the responsibility for coordinating national DM efforts and the National Disaster Management Council (NDMC) is the supreme body for providing overall direction, which is translated in the National Plan for Disaster Management (NPDM 2016-2020).

64. Depending on the nature of disaster and geographical location and length of exposure, time of recovery may differ. The NPDM 2016-2020 and DMP 2015 do not point out the required time to recover from any particular disaster, rather sees the disaster as a national event and respond through the mechanisms defined in said policies. However, a BAU campus specific recovery process and time is still in need to be researched and developed. A general indication of two common and likely disasters are discussed below:

65. **Fire Recovery.** There are three phases of rehabilitation following fire hazards on any of the buildings of BAU campus:

- Fire Suppression Damage Repair
- Emergency Stabilization
- Long-Term Recovery and Restoration

66. **Fire Suppression Damage Repair**. A series of immediate post-fire actions taken to repair damages and minimize potential structural damage of the buildings, soil erosion and impacts resulting from fire suppression activities and usually begins before the fire is contained, and before the demobilization of an Incident Management Team. This work repairs the electrical lines, roads, trails, staging areas, safety zones, and drop points used during fire suppression efforts. **This stage might take from one week to several weeks.**

67. **Emergency Stabilization.** Fires result in loss of vegetation, exposure of soil to erosion, and increased water runoff that may lead to flooding/waterlogging, increased sediment, debris flow, and damage to critical natural and cultural resources. Actions such as: installation of erosion and water run-off control structures, temporary barriers to protect recovering areas, and installation of warning signs may be implemented. At later stage the recovery works replace safety related facilities; remove safety hazards; contain hazardous materials (in case of laboratories), restore electric lines, restore telecommunications lines, internet lines etc. emergency structural stabilization is also checked. If the building structures is not stable, at this stage a notice is declared to the users as 'off limit' until restoration is done. **This stage usually takes 1 to 4 weeks depending on the size of the structure and damage done to the facility.**

68. **Long-Term Recovery and Burned Area Rehabilitation.** This stage involves non-emergency full scale restoration of the facility. **Time may take couple of months to 1 year at this stage. If the facility is destroyed, then this phase may extend to 5 -10 years**.

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69. **Earthquake recovery.** A generalized timeline and framework for earthquake disaster. recovery has been shown in **Error! Reference source not found.**5. Time to recover based on previous examples have been presented in **Error! Reference source not found.**6.

Figure 5 Generalized Recovery Timeline and Framework After Disaster

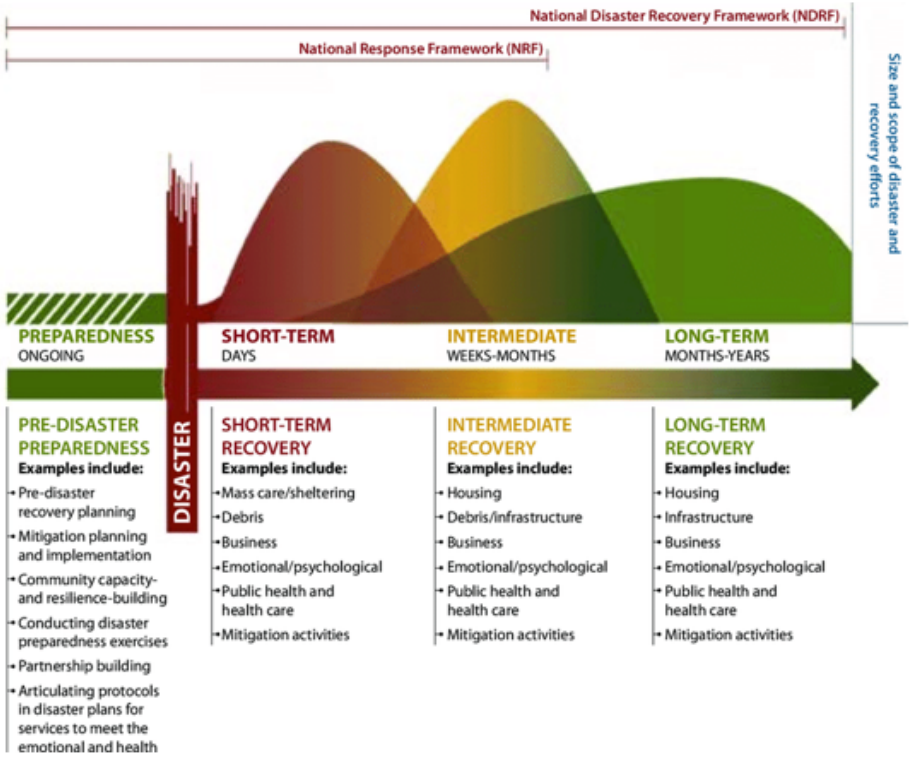
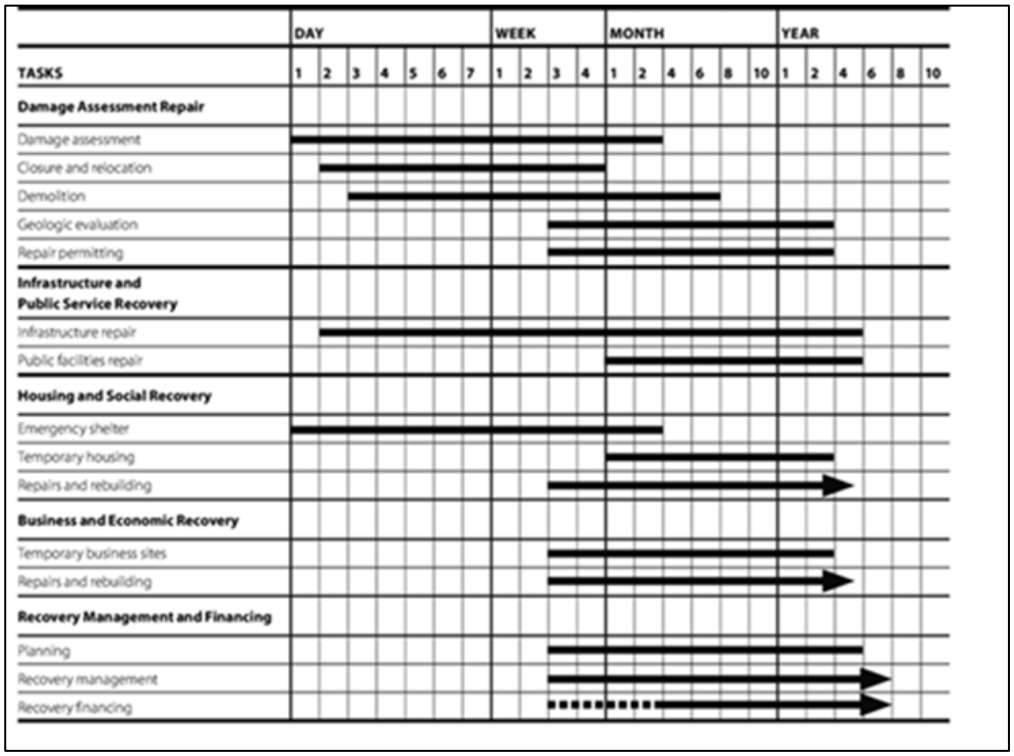


Figure 6 Time to Recover from Earthquake from Various Facilities



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REPORTING OF RESIDUAL RISKS

70. According to the Sendai Framework for Disaster Risk Reduction 2015-2030 residual risk is the disaster risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.

71. Residual risk assessment and reporting is actually part of the risk assessment. It is the combined effort of: (i) identifying and analyzing possible future events that could adversely affect individuals, assets, processes and/or the environment (i.e., risk analysis)" and (ii) making judgments about managing and tolerating risk based on a risk analysis while considering influencing factors (i.e., risk evaluation). Residual risk is the last part of the assessment process. Each and every risk is not possible to manage 100%. Hence, the risk that is left after mitigation is the residual risk. Residual risk is important for several reasons. First to consider is that residual risk is the risk "left over" after security controls and process improvements have been applied. This means that residual risk is something organizations might need to live with based on choices they've made regarding risk mitigation. Or they could opt to transfer the residual risk, for example, by purchasing insurance to offload the risk to an insurance company.

72. Thus, a classic residual risk formula might look something like this:

Residual risk = inherent risk - impact of risk controls ---------- (1)

73. **Management and reporting of residual risk.** Managing residual risk comes down to the organization's willingness to adjust the acceptable level of risk in any given scenario. For any residual risk present, BAU can do the following:

- **Nothing.** Assuming the residual risk is below the acceptable level of risk in any endeavor, organizations can simply accept that the implemented controls have proven effective enough to reduce the risk to an acceptable level.
- **Update or increase controls implemented**. In the case that residual risk is still above an acceptable risk level, new or modified controls and processes may be needed to reduce the inherent risk to a level that is deemed acceptable. In such case, the Emergency Management Committee of BAU (discussed in earlier sections) will assess the situation and decide whether the residual risks can be contained. The financial mechanisms like insurance can be deployed. However, such residual risk analysis report and recommendation of the emergency management committee to contain the risk should be kept at the planning division of BAU for emergency use.
- **Evaluate controls vs. mitigation costs to make a decision**. In the case where the residual risk is still beyond the acceptable level of risk and the cost of the needed controls and countermeasures is too high, BAU may need to accept the risk, regardless of what residual risk remains.

74. In general, when addressing residual risk, BAU should follow the following steps:

(i) Identify relevant governance, risk and compliance requirements.
(ii) Determine the strengths and weaknesses of the organization's control framework.
(iii) Acknowledge existing risks.
(iv) Define the organization's risk appetite.
(v) Identify available options for offsetting unacceptable residual risks.

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APPENDIX 10
Online Perception Survey Questionnaire

BAN: Strengthening Agricultural Tertiary Education Project
Online Perception Survey

We want to hear from you …

Through the Ministry of Education and the University Grants Commission, the Bangladesh Agricultural University (BAU) will embark on a project to improve the quality and relevance of tertiary agricultural education and research.

As part of the process, we invite you to do this short online survey as we value your views. Your inputs are important to us.

About the Project

Recognizing the need to accelerate speed of advanced agricultural technology adoption, agricultural education and research needs to be strengthened. This includes curriculum updates to keep abreast of the emerging agricultural practices, linkages with agricultural industry and entrepreneurship, and high-technology research network. The proposed project will have four outputs (*link to project description disclosure*), which will involve new research facilities, renovation and extension of existing classrooms, new equipment and instrumentation, curriculum update, and research grants. The project is expected to be implemented from March 2021 until June 2026.

Questions	Response
1. Do you have any information about the proposed project?	( ) Yes ( ) No
2. If yes, how did you know about the project?	( ) BAU staff ( ) MOE or UGC ( ) Other government agencies ( ) News (i.e., TV, radio, local newspaper) ( ) Social media (e.g., FB, Twitter, Instagram, etc.) ( ) BAU website ( ) Friend/neighbor/local resident ( ) Government official ( ) Previous/ongoing similar project
3. Which group do you belong to?	( ) Student in BAU ( ) Business owner ( ) Interested individual and/or local resident ( ) Government staff/official ( ) Member of NGO/CBO ( ) Others (please specify)
4. How do you think the project will affect you (or your organization)? Check all that apply.	( ) Disruption of classes or work schedule ( ) Safety during construction ( ) Air pollution and noise during construction ( ) Generation of employment ( ) Potential for small-scale business opportunities ( ) Improvement in quality of agricultural education and research ( ) Better classrooms and use of up-to-dare equipment in agricultural education ( ) Others (please specify)
5. What are your main concerns/issues about the project? Which aspects of this project do you think should be considered more important?	( ) Transparency and governance during implementation (e.g., recruitment of workers, selection of training, research grants, etc.)

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Questions	Response
	( ) Access to opportunities within the project ( ) Environmental health, and safety during construction and renovation/expansion ( ) Management of waste generation during construction and post-construction ( ) Emergency response and disaster preparedness for the project and BAU in general ( ) Disruption to daily activities in BAU during construction stage ( ) Air pollution and noise ( ) Employment ( ) Water requirements for the new building and expansion of existing buildings ( ) Community safety during construction ( ) Others (please specify)
6. Can you suggest how best to address your concerns/issues? Check all that apply.	( ) Regular update on progress of the project to BAU community ( ) Regular consultations to the BAU community particularly during construction stage ( ) Disclosure of clear and transparent process in job recruitment and training placement ( ) Public disclosure of clear grievance redress mechanism ( ) Contractor responsibility and accountability during construction ( ) Compliance to environmental regulations ( ) Monitoring of contractor performance on environmental management ( ) Others (please specify)
7. Specifically, what concerns/issues do you have on the implementation of the project with respect to the following (check all that apply):	( ) Community health and safety ( ) Air quality ( ) Water quality ( ) Clearing of vegetation and land ( ) Noise ( ) Potential local traffic and road accident ( ) Generation of waste ( ) Employment ( ) Others (please specify)
8. What positive impacts and/or benefits do you think the project will have? Check all that apply.	( ) Improvement in quality of agricultural education ( ) Opportunities for better and relevant R & D ( ) Creation of jobs and training for students and faculty ( ) Enhancement of safety condition for female students and faculty ( ) Access to better equipment and educational resources ( ) More comfortable classrooms and educational facilities ( ) Create more interests in joining agricultural education ( ) Others (please specify)
10. On a scale of 1 to 5 (1 = very unsafe; 2 = unsafe; 3 = fair; 4 = safe; 5 = very safe), how safe do you think construction-related activities for the project?	( ) 1 very unsafe ( ) 2 unsafe ( ) 3 fair ( ) 4 safe ( ) 5 very safe

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Questions	Response
11. Would you like to get more information about the project?	( ) Yes ( ) No
12. If yes, what kind of information are you interested in?	
13. How best can we communicate with you in the future to give you updates on this project?	( ) Newsletter ( ) Workshop ( ) Project website through the university ( ) Email ( ) Social media (e.g., FB, Twitter, etc.) ( ) Town hall meeting ( ) Not interested

As our partner in this proposed development project in BAU, we would like to know about you …

Question	Response
14. Gender	( ) Male ( ) Female
15. Age	( ) 18 – 25 ( ) 26 – 35 ( ) 36 – 45 ( ) 46 – 55 ( ) 56 – 60 ( ) over 60
16. Do you live in BAU campus?	( ) Yes ( ) No
17. How far is your residence from BAU campus?	( ) within 500 meters ( ) within 1 km ( ) over 1 km away
18. How many years have you lived in Mymensingh?	( ) less than 5 years ( ) over 5 years
19. Please let us know if you have any other requests and concerns not covered under the survey.	

Thank you for doing the survey!

BAU Project Team

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APPENDIX 11

Public Consultation List of Participants

STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
1.	Prof. Dr. Md. Azizul Haque	✓		BAU	Dean Faculty of Agriculture
2.	A.B.M. REZAUR RAHMAN	✓		BAU	Planning & Dev. Section, BAU
3.	MD. OMAR FARUK	✓		BAU	planning & Dev. Section, BAU.
4.	Md Atik Us Saiful	✓		BAU	Head, Seed Sci., BAU
5.	M. Jalal Uddin	✓		BAU.	
6.	Md. Jobed Ali	✓		BAU	
7.	Md. Shaikh Mehedi Rumi	✓		BAU	Student
8.	Md Rakibul Islam	✓		BAU	Student
9.	Biproder Karmoker	✓		BAU	student
10.	Md. Abdul Kalam	✓		BAU	
11.	Sarif Istiak Akash	✓		BAU	
12.	Kazi Nazmus Salehin Rafi	✓		BAU	Student
13.	Asraful Alam	✓		BAU	student

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ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
14.	Dr. Md. Zahirul Alam	✓		BAU,	Service
15.	Labon chowdhury		✓	K. B. High school	House wife
16.	Sayed Rayhan Uddin	✓		K. B. High School	Headmaster
17.	Ahmad Zubayer Zawad	✓		K. B. High School	Student
18.	Muhammad Mozamel Rahman	✓		BAU	Service
19.	Md. Yusuf Ali	✓		BAU,	Service
20.	M. A. S. Shahinur	✓		BAU	Mill
21.	Sabbir Ahmed Shuvo	✓		BAU	Soldier
22.	Biprodev Karmokar Shuvo	✓		BAU	Shuvo
23.	Mashoor Ahmed Bhuiyan	✓		BAU	Mashoor
24.	Shakil Hosen	✓		BAU	Shakil
25.	Rakibul Hasan Khan	✓		BAU	Nakib
26.	Nafeul Islam Nishan	✓		BAU	Nishan

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ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
27.	Md. Habibur Rahman	✓		BAU Journalist Association	Journalist
28.	Esrat Jahan Mim		✓	BAU	student
29.	Dr. M. Ekram ul Haque	✓		Director (TP) BINA	Service
30.	Dr. Md. Haroun-or Rashid PSO	✓		BINA	Service
31.	Asaduzzaman shahed	✓		BAU	student
32.	KH. Tayef Riyad	✓		BAU	KH Tayef
33.	Kol. Md. Shahed Hussain	✓		BAU	
34.	Rokibul Hasan Riday	✓		BAU	Riday
35.	md. saiful	✓		BAU	Saiful
36.	H.M. Rokanuzzaman	✓		BAU	
37.	Mosiur	✓		BAU	
38.	MD. Atik Shahriar	✓		BAU	
39.	MD. SHAHRIAR KHANDA KAR	✓		BAU	

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STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

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SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
01.	MD. RAFIQUL ISLAM	✓		Agg Econ. BAU	Student.
02.	MD. ABIB AHMED LIMON	✓		Food Engg.	Student
03	Prof Dr. Md. Zainal Abedin	✓		BAUFES	Director
04.	Prof. Dr. md. Rejaul Islam Sarker	✓		Fisheries Faculty	Director
05.	Prof. Dr. Md. Rakib Hassan	✓		Ag. Engg.	Teacher
6	Prof Dr Shajahan Akhter		✓	A.H	Dean A.H Faculty
7	MD. SHAMSUL ISLAM	✓		Mymensingh Educ. Board	Controller of Exam.
8.	MD Rajon	✓		KB. High school	teacher
9.	Iqramul Haque	✓		Agriculture	Student
10	Mrinal Kanti Jaiswaden	✓		Agriculture	Student
11	Md Amanullah	✓		Ag. Engg.	Student
12.	Rakibul Hasan	✓		BAUJA	journalist
13	Md. Alamgir	✓		FND, BAU	[illegible]

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STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

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SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
	Fiha Noor A-Jannat		✓	Agriculture university high school	Student
	SM Shariful Hassan			BAU, Agronomy	Job
	MD. Rafiqul Islam			BFRI.	Job
	Dr. Abul Kalam Mohammad Azad	✓		DGMO Health Care Centre	Doctor.
	Din Mohammed			DD, PR BAU	
	Dr. Abul Kalam Azad	✓		BAU	
	Mohammad Abir Akanda			Planning & Development BAU	JOB
	Engr. Md. Shaheen Islam Khan	✓		C.E.	
	Engr. A.K.M. Kamruzzaman	✓		SE, PWD	
	Momotaz Begum		✓	BAU	Service
	Prof. Alamgir Hossain	✓		CSRP BAU	Profes.
	Md Rayhan Abid	✓		BAUJA	Journalist
	Sanjida Islam Raina		✓	Agriculture	Student

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STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
	Prof. M.A Hashem	✓		BAU,	Professor
	Fahad Bin Amin	✓		Firmament Studio	Photographer
	Prof Dr. M. Rafiqul Islam	✓		BAU	Coordinator
	Md. Anafat Islam Sium	✓		Faculty of Agriculture Student Association	Student
	Dr. Md. Habibur Rahman	✓		BINA	Head, Ag. Econ.
	Dr. Md. Nurul Hoque	✓		FSEE	Retired Professor
	Read At Deen	✓		Animal Husbandry	Organising secretary.
	Md. Moniruzzaman	✓		Agronomy	Student
	Tanzir Anwar	✓		Agri. Chemistry	Student.
	Dr. Md. Rabiul Islam	✓		P&D, BAU	Govt. Service
	Dalia Khatun		✓	P&D, BAU	At Engineer
	S.M. Saiful Islam Publication Officer & Incharge, BFRI Dormitory BFRI,	✓		BFRI	Publication Officer
	MD. Moniruzzaman DS, Mymensingh Board.	✓		DS, BISE	Education officer.

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STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
01	[illegible]		✓	[illegible]	[illegible]
02	[illegible]	✓		BFRI	[illegible]
03	[illegible]	✓		[illegible]	[illegible]
04	Prof. Dr. Md. Abul Mannan	✓		Dean, Faculty of Fish. BAU, Mym.	Professor & Dean
05	Nasif Farhan	✓		Project Associate, TML, Feasibility & DPP Prep. Team, SATEP, ADB	Project Associate, SATEP(F.S.&DPP)
06	Abdullahel Hillal	✓		Project associate, TML, ADB	Project associate.
07	Md. Abdullahel Kafee	✓		KGF	Accountant
08	Professor dr. MA Awal	✓		Vet. Sci BAU.	Dean. FVS.
09	Prof. Dr. Md. Mokles Hossain	✓		BAU-GPC	Trustee
10	pabitra Kumar Dey	✓		APEX	[illegible]
11	Mohammad Sowrov Shahrian	✓		Agricultural [illegible]	Student
12.	J M. Azad Hossain	✓		[illegible] LGED	[illegible]
13.	Mohammad Shahinur Ferdous	✓		LGED Sr. Assistant Engr.	[illegible]

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STRENGTHENING AGRICULTURAL TERTIARY EDUCATION PROJECT (SATEP)

Stakeholders' Consultation
20 December 2022
Bangladesh Agricultural University
Mymensingh, Bangladesh

ATTENDANCE SHEET

SL No.	Name	Gender		Organization or Affiliation	Occupation
		Male	Female		
	[illegible]	✓		কৃষি এক (Contract Farm)	কৃষি কাজ
	[illegible]	✓		কৃষি এক (Contract farmer)	কৃষি কাজ
	[illegible]		✓	Contract farm	কৃষি কাজ
	ড. মো: [illegible]	✓		BAUEC	Additional director
	[illegible]	✓		[illegible]	Pe. of Director student
	ড. মো: [illegible]	✓		Trans Management Ltd. Share	Consultant
	Dr. Kazi Md. Noor Nevaz	✓		ADB	Consultant (Local)
	Prof. Dr. Md. Ariful Islam	✓		Microbiology and Hygiene Dept. BAU	professor
	Fijesh Kumar Dey	✓		Firmament	Photographer
	[illegible]	✓		Makeinang	property
	Rezaul Mahabub Roni	✓		Faculty of Ag. Student association	Reporter
	Dr. Md Nazrul Islam	✓		Dean Faculty of Engg.	
	Md. Kamrul Hasan	✓		LGED	Addition CE

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APPENDIX12

Terms of Reference

PMU Environmental Safeguard Officer (Consultant)

A. Objective and Purpose of the Assignment

1. The assignment aims to ensure that (i) due diligence and assessment of potential environmental impacts are undertaken, (ii) environmental assessment and due diligence documents are prepared following the requirements of the Safeguard Policy Statement (SPS) 2009 of ADB and the applicable environmental regulations of the government, and (iii) assess the institutional capacity of the executing agency and implementing agency on environmental management and compliance.

B. Scope of Work

2. An experienced national environment specialist will provide technical support to the project management unit (PMU) in planning and in incorporating features to avoid potential adverse environmental impacts throughout the project cycle, and when avoidance is not possible, mitigate such impacts. The national consultant will work together with the PMU and the project implementation committee (PIC) in ensuring that the environmental requirements of the government and ADB through SPS 2009 are complied.

C. Detailed Tasks and/or Expected Output

3. Duties and tasks of the Environmental Safeguard Consultant include but are not limited to the following:

(i) Provide technical support to the PMU to ensure that all environmental requirements of ADB including occupational health and safety requirements of the government are complied with by the project;
(ii) Ensure that the IEE (with the EMP and EMOP) are included in the bid documents and civil works contracts by providing the necessary inputs and review of such documents;
(iii) Assist the PMU in evaluating the environmental aspects of the bids submitted during the bidding process;
(iv) Assist the PMU in the review and approval of the CEMP prepared by the Contractor(s)
(v) In coordination with the PMU, update/revise the draft IEE based on the latest design of the new buildings and the scope of building renovation/refurbishment; submit to ADB for review, clearance, and disclosure to ADB website;
(vi) Ensure that no construction work will commence until the updated/revised IEE has been cleared by ADB;
(vii) Set-up the GRM and assist the PMU in conducting the GRM training to PIC, contractors, local government representatives, project-affected persons, and other key stakeholders;
(viii) Assist the PMU in conducting environment-related training such as introduction to SPS 2009, compliance to EMP and EMOP, ECR 2023, etc.;
(ix) Implement a system for monitoring the environmental safeguards;
(x) In coordination with the PMU and environmental staff of contractor, conduct regular

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site visits at the construction site to verify/check compliance to EMP and EMoP including adherence to occupational health and safety provisions and core labor standards;

(xi) Together with the PMU, PIC, and contractor representatives, conduct stakeholder consultations, as appropriate, to determine if there is any concern during construction as well as post-construction;

(xii) Assist PMU in obtaining the required permits from the DoE and other relevant government authorities prior to start of construction works;

(xiii) Confirm and ensure that all mitigation measures and monitoring requirements have corresponding budgets;

(xiv) Ensure that environmental requirements are incorporated in the renovation/refurbishment bid documents and works contracts;

(xv) Assist PMU in reviewing the environmental monitoring reports (EMRs) submitted by the Contractor(s);

(xvi) Take immediate action in case of unexpected adverse impact or ineffective mitigation measures identified during implementation and in preparing the required corrective action plan (CAP);

(xvii) Assist the PMU in preparing the EMRs required by ADB, and in monitoring compliance of contractor to the environmental, health and safety requirements;

(xviii) Assist PMU in addressing comments from ADB on the revised/updated IEE, the EMRs, and the CAP;

(xix) Assist the PMU in addressing grievances through the GRM in a timely manner, prepare a record of such grievances for inclusion in the EMRs;

(xx) Assist in any relevant works that may be assigned by the PMU.

D. Reporting Requirements

- Revised/updated IEE which includes the EMP and the EMoP based on the latest design for review and clearance by ADB
- Training materials for PMU staff as well as relevant BAU staff on EMP implementation
- Environmental monitoring reports to be submitted to ADB (semi-annual during construction, annually post-construction)
- Site inspection reports, and corrective action plan (if required)
- Environmental audit of existing academic facilities for renovation/refurbishment

E. Minimum Qualification Requirements

4. The environmental safeguard consultant for the PMU will be sourced through national selection to render 12 person-months of inputs within 24 months on an intermittent basis.

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

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APPENDIX 13

Format of Environmental Monitoring Report during Construction Phase

Legend
black text without brackets = mandatory standard wording
{black text within brackets} = {optional standard wording}
red text = instructions for writer
blue text = hyperlinked text

Environmental Monitoring Report

PUBLIC

{Annual/Semestral/Quarterly} Report
{Month Year}

Bangladesh: Strengthening Agricultural Tertiary Education Project

Prepared by the Secondary Higher Education Division under the University Grants Commission of the Ministry of Education for the Asian Development Bank

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CURRENCY EQUIVALENTS

(as of {Day Month Year})

{The date of the currency equivalents must be within 2 months from the date on the cover.}

Currency unit	–	{currency name in lowercase (Symbol)}
{Symbol}1.00	=	${ }
$1.00	=	{Symbol_____}

ABBREVIATIONS

{AAA}	–	{spell out (capitalize only proper names)}
{BBB}	–	{spell out}
{CCC}	–	{spell out}

{WEIGHTS AND MEASURES}

{symbol 1 (full name 1)}	–	{Definition 1}
{symbol 2 (full name 2)}	–	{Definition 2}
{symbol 3 (full name 3)}	–	{Definition 3}

{GLOSSARY}

{Term 1}	–	{Definition 1}
{Term 2}	–	{Definition 2}
{Term 3}	–	{Definition 3}

NOTE{S}

(i) The fiscal year (FY) of the Government of {name of borrower} {and its agencies} ends on {day month}. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2011 ends on {day month} 2011. {Note: If FYs are not referred to within the text, delete the entire note and change NOTES to NOTE.}

(ii) In this report, "$" refers to United States dollars {if a second $ currency is referred to in the text, e.g., NZ$ or S$, add: unless otherwise stated}. {In the text, use "$" for United States dollars and the appropriate modifier, e.g., NZ$ or S$, for other currencies that use the "$" symbol.}

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or Staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of ADB's website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

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Executive Summary

- Brief status of environmental compliance during the coverage period

1.0 Introduction

1.1 Brief Project Description
1.2 Project Progress Status and Implementation Schedule

2.0 Compliance to National Regulations

{These are just sample environmental regulations}

2.1 Environmental Conservation Rules 2023
2.2 Bangladesh Labour Law 2013 (amended 2023)
2.3 Bangladesh Labour Rules 2015

3.0 Compliance to Relevant Environmental Requirements from the ADB Loan Agreement

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

4.0 Compliance to Environmental Management Plan

{Refer to the EMP of the Project}

5.0 Safeguards Monitoring Results and Unanticipated Impacts

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

6.0 Implementation of Grievance Redress Mechanism and Complaints Received from Stakeholders

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

7.0 Conclusion and Recommendations

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

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APPENDIX 14

Proposed Format of Environmental Monitoring Report Post-construction

Legend
black text without brackets = mandatory standard wording
{black text within brackets} = {optional standard wording}
red text = instructions for writer
blue text = hyperlinked text

Environmental Monitoring Report

PUBLIC

{Annual/Semestral/Quarterly} Report
{Month Year}

Bangladesh: Strengthening Agricultural Tertiary Education Project

Prepared by the Secondary Higher Education Division under the University Grants Commission of the Ministry of Education for the Asian Development Bank

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CURRENCY EQUIVALENTS

(as of {Day Month Year})

{The date of the currency equivalents must be within 2 months from the date on the cover.}

Currency unit	–	{currency name in lowercase (Symbol)}
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{WEIGHTS AND MEASURES}

{symbol 1 (full name 1)}	–	{Definition 1}
{symbol 2 (full name 2)}	–	{Definition 2}
{symbol 3 (full name 3)}	–	{Definition 3}

{GLOSSARY}

{Term 1}	–	{Definition 1}
{Term 2}	–	{Definition 2}
{Term 3}	–	{Definition 3}

NOTE{S}

(iii) The fiscal year (FY) of the Government of {name of borrower} {and its agencies} ends on {day month}. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2011 ends on {day month} 2011. {Note: If FYs are not referred to within the text, delete the entire note and change NOTES to NOTE.}

(iv) In this report, "$" refers to United States dollars {if a second $ currency is referred to in the text, e.g., NZ$ or S$, add: unless otherwise stated}. {In the text, use "$" for United States dollars and the appropriate modifier, e.g., NZ$ or S$, for other currencies that use the "$" symbol.}

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Executive Summary

- Brief status of environmental compliance during the coverage period

1.0 Introduction

1.1 Brief Project Description
1.2 Status/condition of the new buildings

{i.e., a checklist can be provided to indicate condition of the interior and exterior of the building}

2.0 Compliance to National Regulations

{These are just sample regulations}

2.1 Disaster Management Act 2012 (relevant requirements for safety of school/university buildings)

3.0 Compliance to Environmental Management Plan

{Refer to the EMP during post construction}

4.0 Results of Environmental Monitoring Plan

{Refer to the EMOP during post construction}

5.0 Conclusion and Recommendations

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

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