

Draft Initial Environmental Examination

August 2016

BAN: Skills for Employment Investment Program (Tranche 2)

Modernization of Existing Technical Training Centers in Dhaka, Khulna,
and Sylhet

Prepared by the Skills Development Coordination and Monitoring Unit
For Skills for Employment Investment Program (SEIP)
Finance Division, Ministry of Finance
Government of Bangladesh

CURRENCY EQUIVALENTS

(as of 2 August 2016)

Currency unit - taka (Tk)

Tk1.00 = \$0.01305

\$1.00 = Tk76.6404

ABBREVIATIONS

ADB	–	Asian Development Bank
BARC	–	Bangladesh Agricultural Research Council
BBS	–	Bangladesh Bureau of Statistics
BGTTC	–	Bangladesh German Technical Training Center
BMD	–	Bangladesh Meteorological Department
BMET	–	Bureau of Manpower, Employment and Training
DOE	–	Department of Environment
EIA	–	environmental impact assessment
EMP	–	environmental management plan
IEE	–	initial environmental examination
GPS	–	global positioning system
GRC	–	grievance redress committee
KTTC	–	Khulna Technical Training Center
MEWOE	–	Ministry of Expatriates' Welfare and Overseas Employment
SEIP	–	Skills for Employment Investment Program
SPS	–	Safeguard Policy Statement
STTC	–	Sylhet Technical Training Center
TTC	–	technical training center

WEIGHTS AND MEASURES

°	–	degree
As	–	arsenic
Fe	–	iron
Ft	–	foot
In	–	inch
km ²	–	square kilometer
M	–	meter
mm	–	millimeter
Mn	–	manganese
NO _x	–	nitrogen oxide
Ph	–	potential hydrogen
PM	–	particulate matter
SPM	–	shock pulse method
SO ₂	–	sulfur dioxide
TDS	–	total dissolved solids

NOTES

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I. EXECUTIVE SUMMARY

A. Project Description

1. The Skills for Employment Investment Program (SEIP) supports the Government of Bangladesh's reforms in skills development according to the National Skill Development Policy, 2011 financed by the Asian Development Bank (ADB). It supports large-scale private sector involvement and public-private partnerships, as well as public training centers, to train skilled workers, in order to enhance productivity and meet skills needs in the labor market. The SEIP particularly helps the government to scale up skilling of new entrants and up-skilling of existing workers that will contribute to higher growth in priority sectors. The impact of the project will be increased income and productivity of the working population aged 15 years and over. The outcome will be increased employment in priority sectors and skills for males and females. There are four targeted outputs: (i) market responsive inclusive skills training delivered; (ii) quality assurance system strengthened; (iii) institutions strengthened; and (iv) effective program management.

2. The SEIP is currently preparing Tranche 2 project which is aimed at expanding the skilling capacity of public and private training providers and providing mid- to higher-levels skills training programs. For this purpose, Tranche 2 project will support the modernization of three technical training centers (TTCs) under the Bureau of Manpower, Employment, and Training (BMET) which will involve renovation of existing training facilities and provision of new equipment, according to new curricula to be developed. The three TTCs to be supported are: Bangladesh German TTC (BGTTTC) in Dhaka, TTC in Khulna, and TTC in Sylhet.

3. Given civil works involved in upgrading TTCs which are expected to have limited and minimum adverse environmental impacts, Tranche 2 is categorized "B" for environment. Based on the environmental assessment review framework prepared for the overall investment program of SEIP, this initial environmental examination (IEE) has been carried out as per ADB's environmental screening category. The IEE, along with environmental management plans (EMPs), has been prepared for all three sites of TTCs. The reports have been prepared according to the SEIP's existing environmental assessment review framework, which outlines required steps for IEE and EMP according to the ADB's Safeguard Policy Statement (SPS) (2009).

B. Description of Existing Environment in the Project Area

4. Baseline environment is concerned with existing physical, biological, and socioeconomic conditions of the area where the project is going to be set up. The land form and soil type, surface water, ground water, ambient air quality, and noise level have been analyzed to evaluate the primary baseline of the area.

5. From the physical study of the area, it is found that the three TTC areas are predominantly urban and free from flood.

6. The climate of the region is of tropical monsoon type. Annual average rainfall is 2,000 mm for Dhaka, 1,809.4 mm for Khulna, and 3,852 mm for Sylhet. Average highest temperature is 39.6°C and lowest temperature is 7.2°C for Dhaka, 40.5°C and 7.0 °C for Khulna, and 39.6°C & 7.7 °C for Sylhet have been found in June and January respectively in 2013. The highest humidity in the period of 2009–2013 was 84% and lowest humidity was 52% for Bangladesh. As

would be expected, relative humidity during the wet season is significantly higher than those occurring in other period of the year.

7. According to the Bangladesh Meteorological Department (BMD), the average wind speed at Dhaka within March to September is 2.8 knots in 2013, at Khulna area within January to December is 2.3 knots in 2013, and the average wind speed at Sylhet within March to September is 2.83 knots in 2013. The sites are similar to the character to many areas of alluvial delta in Bangladesh with mixed crop vegetation. Rice, other grains, and seasonal vegetables are the main crops in this area. Other than monoculture tree plantations, no forestland is involved in this area. In common with other peri-urban areas, birds like crow, salik, kokil, etc. are seen at times at the project site.

8. The main aquatic fauna in these areas are different types of fishes. Main rivers are turag in Dhaka, rupsa (bhairab), arpangachhia, shibsa, pasur, koyra in Khulna and Surma, kushiyara, piyain, and gorai in Sylhet.

9. According to the population census in 2011, the total population of **Mirpur Thana** was 1,074,232, where the males constituted 54.2% and females 45.9%. The total population of **Khulna District** was 2,318,527, where the males constituted 1,175,686 and females 1,142,841. The total population of **Sylhet District** was 2,680,639, where the males constituted 1,330,095 and females 1,350,544.

C. Potential Environmental Impacts and Mitigation Measures

10. The construction of the project can create some adverse impact on the existing environment. The acoustic impacts, dust emission, traffic congestion and sanitation during the construction period would be limited to construction of building and site preparation. Since the project would be implemented on its own land, the resettlement will not be an issue here. During construction, the contractor will adopt all necessary measures to reduce the probable environmental impacts from different aspects. There are minimal impacts during operation period and a local staff from each TTC will be responsible to take necessary steps during operation.

11. The significant impacts in different phases are (i) due to project location and preparation; (ii) construction phase; and (iii) operation phase have been identified using the checklist process. From this process, the main potential environmental impacts, which may arise due to construction, can be grouped as follows: (i) atmospheric emissions and air quality; (ii) noise generation; (iii) water pollution and waste water disposal; and (iv) health and safety.

12. These aspects have been examined and the findings are summarized below.

**Table 1: Summary Analysis of Beneficial Impacts
Technical Training Centers in Dhaka, Khulna, and Sylhet**

Project Activities	Beneficial Impacts
Pre-Construction	
1. Land Value	- No land value depreciation - Land value enhancement anticipated due to the development
Construction	
2. Employment	- Major employment opportunity (positive impact)
3. Increasing local business	- Local business will be enhanced due to the construction activities
Operation	
4. Socioeconomic impact	- New construction of educational institutes will attain more access and retention of students - Increasing skilled training may develop the society and neighborhood - Provision of permanent and temporary employment opportunities
5. Landscaping	- A net increase in green cover would provide increased habitat for birds and small mammals (positive impact)
6. Renewable energy option	- Solar panel may be installed at the roof of the building to save energy and CO₂ emission
7. Rainwater	- Provision of "rainwater harvesting" systems in the building will meet the water demand

**Table 2: Summary Analysis of Adverse Impacts
Technical Training Centers in Dhaka, Khulna, and Sylhet**

Project Activities	Adverse Impacts
Pre-Construction	
1. Land acquisition	- Loss of access to the site (local communities, students, and staff crossing the area); inconvenience
2. Site preparation, clearing, and earthworks	- Clearing of vegetation (minor impact) - Reduction in visual aesthetics of the current land (access road, truck traffic, construction equipment, and eventually a building on site) - Land development may create problems in local drainage pattern (minor impact) - Emission of dust (minor impact) - Improper management of construction debris and solid waste may pose risk to the neighbors (minor impact) - Associated noise (minor impact)
Construction	
3. Influx of workers	- Health and safety of workers at site may pose risk in some cases (minor impact) - Concentration of labor force create un-hygienic condition and risk of safe drinking water and sanitation hazard (medium adverse impact) - Improper site security may pose risk to the workers or community (minor impact)
4. Construction equipment/materials	- Piling, brick/stone crushing and equipment installations may create noise (minor impact) - Carrying of construction materials may create traffic congestion (minor impact) - Cutting/filling, stockpiling of construction material and traffic movement may create dust emission (minor impact) - Improper management of construction debris and solid waste may pose risk to the existing TTC staff and students (minor impact)

Project Activities	Adverse Impacts
5. Vehicle and pedestrian traffic	- Slightly more congestion near the main entrance to the TTC (minor impact) - Increased number of vehicles on local roads will result in increased wear and tear of local roads thus reducing lifespan of affected roads (minor impact) - Pedestrians and cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads (minor impact) - There will be an increase of exhaust emission from vehicles, which will pollute local atmospheric air (minor impact)
6. Employment of child labour in the construction activities	- The Environmental and Social Safeguard Policies of the Department of Energy (DOE) and ADB prohibits all kinds of child labour (lower than 14 years) and personnel engagement in construction works of the projects
Operation	
7. Vehicle and pedestrian traffic adjacent to the TTCs	- Slight more congestion near the main entrance of the TTCs - Increased number of vehicles on local roads will result in increased wear and tear of local roads, thus reducing lifespan of affected roads; (minor impact) - Pedestrian cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads (minor impact) - There will be an increase of exhaust emission from vehicles, which will pollute local atmospheric air (minor impact)
8. Generation of consumables	- Risk of poor solid waste management - Risk of sanitation hazard
9. Increased demand on local services	- Increased risk of water shortages and electricity load shedding
10. Extreme climate events, disasters, and emergency	- Bangladesh, as a whole, poses to extreme earthquake zone - Fire hazard or any medical emergency may arise during operation of the building

D. Analysis of Alternatives

13. The 'No Build' alternative in the present case would mean there would be shortage of classrooms and other training facilities in the existing three TTCs and hence, the development of skills training in Bangladesh will be hampered. So, the 'No build' alternative is unacceptable, and the potential socioeconomic benefits of implementation of such a project far outweigh the adverse impacts, all of which can be controlled and minimized to an acceptable level.

14. The proposed upgradation project site is owned by BGTTTC, Khulna TTC (KTTC), and Sylhet TTC (STTC), either vacant land or vertical extension facility which have already been allocated, thus no resettlement issues involved. So, there is no logic to find alternative site for the project since it is in the existing TTC premises.

E. Institutional Arrangements

15. The SEIP has been drawn up by the Government of Bangladesh toward skill improvement among the technical workforce of various occupations. The SEIP envisages improvement of job-focused skills and up-skilling of the existing workforce toward ensuring availability of 'required skills to industry standards'. The program has been designed to provide

for market responsive inclusive skills training activities among the selected training providers in the country. These training providers will thus be able to work with industry and help facilitate industry growth and increased employment of skilled workforce. While pursuing its assigned skill enhancement activities, SEIP also envisages engaging in the process, through the apex policy making body, the National Skills Development Council, various local industry associations, and internationally recognized employer associations with substantial membership coverage of priority economic sectors and formally recognized by the government.

16. The Ministry of Finance is the relevant ministry under which SEIP has been formed and thus implementing the project by allocated public funds from the government under a loan from ADB. The SEIP will give the responsibility of planning, designing, implementing, and supervising the construction of the said project to their selected contractor and consultants by bidding. The operation of the said projects will be managed by the respective TTC management and periodically supervised by SEIP. Building contractors will be responsible to take all the necessary measures adopting the Environmental Code of Practices during construction period. The implementation of the EMP and/or Environmental Code of Practices by the contractor(s) is to be supervised by the construction supervision consultant, in close consultation with the project implementation unit of SEIP.

F. Environmental Monitoring and Management Plan

17. In the context of the project, the EMP is concerned with the implementation of the measures necessary to minimize and offset the adverse impacts and to enhance beneficial impacts. Unless the mitigation and benefit enhancement measures are identified and fully implemented, the prime function of the IEE cannot be achieved.

18. For surveillance of the environmental performance of a project, continuous monitoring of the quality of the local environment, environment in the work zone, and the general impact zone have to be performed. For an extension and upgradation project, which may involve 2–3 story vertical extension or a new building, monitoring is mainly important during the construction phase. The SEIP is responsible to implement the overall environmental monitoring and management plan. However, during the construction stage, the contractors are responsible to mitigate all environmental impacts related with the construction activities. TTC principals, teachers, and SEIP will monitor the working environment during operation stage of the building.

G. Information Disclosure, Public Consultation, and Participation

19. Public consultations are very important and sensitive issues for setting up a new project in any area of Bangladesh. Given the very limited scope of this project (construction of a 2-3-storied building), and the expected almost negligible environmental impacts associated with building construction, public consultation, and participation processes have been just preliminary to date. Initial information disclosure and consultation were undertaken during the field visit in June 2016.

20. In the consultation process, local communities, TTC teachers, and students were consulted.

H. Grievance Redress Mechanism

21. As a result of this public participation during the initial stages of the project, major issues of grievance are not expected. However, unforeseen issues may occur. To settle such issues

effectively, an effective and transparent channel for lodging complaints and grievances will be established. The grievance mechanism will be implemented during both the construction and operational period of the project to ensure that all complaints from students, teachers, and local communities are dealt appropriately, with corrective actions being implemented, and the complainant being informed of the outcome. It will be applied to all complaints from affected parties. The TTCs shall set up separate grievance redress committee (GRC) that will address any complaints during both the construction and operational period of the project.

I. Conclusion and Recommendations

22. Though there are certain adverse environmental impacts associated with the implementation of the three projects in existing TTCs, these are manageable, provided recommendations in the EMP are followed with due diligence.

23. The project is indispensable in view of the current skilled training situation in Bangladesh. The impact on the social environment is positive given the skills training of the country will be developed and more access opportunities will be created for local students from the project. One of the most critical issues for the project is safety. This has been adequately addressed through compliance with the Bangladesh National Building Code in the construction to ensure safety during natural disasters like earthquake.

24. The project has been designed to comply with the country's environmental laws and regulations, especially on air emissions, ambient air quality, wastewater effluent, and noise. The project management has taken steps to ensure that the project also meets ADB's SPS, 2009.

II. PROJECT DESCRIPTION

A. Background

25. The Government of Bangladesh recognizes education, which stimulates and empowers people to participate in their own development, as the most important instrument for reducing poverty and improving the quality of life. Therefore, the government placed priorities for the overall development of the education scenario of Bangladesh at different levels especially skilled manpower training. The SEIP has been drawn up by the government toward skills improvement among the technical workforce of various occupations. SEIP envisages improvement of job focused skills and up-skilling of the existing workforce toward ensuring availability of 'required skills to industry standards'. The program has been designed to provide for market responsive inclusive skills training activities among the selected training providers in the country. These training providers will thus be able to work with the industry and help facilitate industry growth and increased employment of skilled workforce. While pursuing its assigned skill enhancement activities, the SEIP also envisages engaging in the process, through the apex policy-making body, the National Skills Development Council, various local industry associations, and internationally recognized employer associations with substantial membership coverage of priority economic sectors and formally recognized by the government.

26. The SEIP supports the Government of Bangladesh's reforms in skills development according to the National Skill Development Policy, 2011 financed by ADB. It supports large-scale private sector involvement and public-private partnerships, as well as public training centers, to train skilled workers, in order to enhance productivity and meet skills needs in the labor market. The SEIP particularly helps the government to scale up skilling of new entrants and up-skilling of existing workers that will contribute to higher growth in priority sectors. The

impact of the project will be increased income and productivity of the working population aged 15 years and over. The outcome will be increased employment in priority sectors and skills for males and females. There are four targeted outputs: (i) market responsive inclusive skills training delivered; (ii) quality assurance system strengthened; (iii) institutions strengthened; and (iv) effective program management.

27. The SEIP is currently preparing the Tranche 2 project which is aimed at expanding the skilling capacity of public and private training providers and providing mid- to higher-levels skills training programs. For this purpose, Tranche 2 project will support public training centers and private industry associations to establish or upgrade training facilities and equipment in existing properties, in order to expand and upscale the quantity and quality of training. The national environment consultant has carried out necessary due diligence and prepared required reports according to the guidelines of the government and ADB.

28. As the SEIP Tranche 2 project will include establishment or renovation of training facilities in several public and private training centers, this IEE report, along with EMPs, has been prepared for all proposed sites. The IEE has been carried out according to the SEIP's environmental assessment review framework, which outlines required steps for IEE and EMP according to government environment regulations and ADB's SPS (2009).

29. This IEE report presents potential environment issues related to the proposed renovation and upgradation project of three existing TTCs at Mirpur Dhaka, Khulna, and Sylhet district towns. The environment assessment has been carried out to ensure that the potential adverse environmental impacts are appropriately addressed in line with ADB's SPS (2009), Environmental Policy (2002), and Environmental Assessment Guidelines (2003).

B. Legislative Requirements

30. The Ministry of Environment and Forest, particularly, the DOE, has the overall responsibility of setting standards for the various parameters of the country's environment. The Environment Conservation Rules (ECR), 1997 addresses, inter alia, standards for air, noise, and water quality, and the requirements for preparing applicable environmental assessment statements for development projects. These standards are of significance for the proposed project.

31. The implementation of the project will be governed by the sector-specific national laws (where applicable) and environmental rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. Compliance is required in all stages of the project's implementation including design, construction, repair, and maintenance. This report has also considered ADB's SPS, 2009 requirements. Provided the project complies with the national and ADB's SPS, 2009 requirements, no significant adverse environmental implications are envisaged either during the preparatory stages or during implementation of the project activities.

1. Safeguard Requirements of ADB

32. All projects funded by ADB must comply with ADB's SPS, 2009 and Operational Manual F1, 2010. The purpose of the SPS is to establish an environmental review process to ensure that projects undertaken as part of programs funded under ADB's loans are environmentally sustainable and sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards.

ADB's SPS include operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process. For 'Category A' project, an environmental impact assessment (EIA), including an EMP, is required. For 'Category B', an IEE, including an EMP, is required and for 'Category C', an EIA or IEE is not required, although environmental implications need to be reviewed through preparation of a due diligence report. The proposed program has been categorized as 'Category B' from an environmental point of view and an IEE, along with EMP, are required to be prepared and disclosed. The assessment will be carried out to ensure that the potential adverse environmental impacts are appropriately addressed in line with ADB's SPS (2009).

2. Safeguard Requirements of the Government of Bangladesh and Environmental Clearance Requirement

33. A wide range of policies, laws, and regulations related to environmental issues are in place in Bangladesh. The main provisions for environmental protection and pollution control in Bangladesh are contained in the Environmental Conservation Act, 1995 and ECR, 1997. Under the ECR, projects are classified as 'Green', 'Orange A', 'Orange B', and 'Red' to determine the level of environmental assessment required.

34. **Green Category** projects are considered relatively pollution-free and hence do not require IEE and EIA. An environment clearance certificate from the DOE is adequate for a project that fall into the green category.

35. **Orange Category** projects fall into two categories. '**Orange A**' projects are required to submit general information, a feasibility report, a process flow diagram and schematic diagrams of waste treatment facilities along with their application for obtaining DOE environmental clearance. **Orange B** projects are required to submit an IEE report, along with their application and the information and papers specified for Orange B projects.

36. **Red Category** projects are those which may cause significant adverse environmental impacts and are, therefore, required to submit an EIA report. It should be noted that they may obtain an initial site clearance on the basis of an IEE report, and subsequently submit an EIA report for obtaining environmental clearance along with other necessary papers, such as feasibility study reports and no objections from local authorities. The DOE has recently developed IEE and EMP checklists in order to simplify the preparation of conventional and voluminous IEE and EMP reports that contain irrelevant and unnecessary information.

37. As per ECR, 1997 all existing and new industries and projects in Orange B and Red category require an EMP to be prepared (after conducting an IEE or EIA) and submitted along with other necessary papers while applying for environmental clearance.

38. Construction of multi-storied buildings is considered as 'Orange B' category in ECR, 1997. However, there is no fixed definition of a multi-storied building. In practice, a building of more than 10 stories within Dhaka City (as per building construction rules of RAJUK) and a building of more than six stories outside of Dhaka city will be considered as 'Orange B' category. It is expected that the physical facilities outside of the Dhaka will not be more than 6-storied building and as such, **no environmental clearance** will be required. If a new construction of more than 6-storied building is considered, an IEE and EMP would be required to get the environmental clearance from the DOE as per ECR, 1997.

3. Other Policies and Legislations

39. In addition to the Environmental Conservation Act and Rules, there are a number of other policies, plans and strategies which deal with the water sector, agricultural development, coastal area, protected area, disaster management and climate change. These are the National Water Policy, 1999; the Forest Act, 1927 (last modified 30 April 2000); National Forest Policy, 1994; the National Conservation Strategy, 1992; National Environmental Management Action Plan, 1995; National Policy for Safe Water Supply and Sanitation, 1998; National Policy for Arsenic Mitigation, 2004; National Sanitation Strategy, 2005; Coastal Zone Policy, 2005; National Food Policy, 2006; Coastal Development Strategy, 2006; National Agricultural Policy, 1999; National Fisheries Policy, 1996; National Livestock Development Policy, 2007; Standing Orders on Disaster, 1999 (revised in 2010); National Adaptation Programme of Action, 2005 (revised in 2009); Bangladesh Capacity Development Action Plan for Sustainable Environmental Governance, 2007; Bangladesh Climate Change Strategy and Action Plan, 2009; National Plan for Disaster Management, 2010–2015; Solid Waste Management Rules, 2010; Noise Pollution (Control) Rules, 2006; etc. The Bangladesh National Building Code, 2006 and Bangladesh Labor Act, 2006 will also be important regarding the occupational health and safety of workers and laborers to be involved in the project's infrastructure development. Besides these the Cabinet has recently approved "Environment Court Bill, 2010" and Bangladesh Wildlife (Preservation) Bill, 2010.

40. The National Building Code, 2006 and National Labor Act, 2006 have defined certain measures to ensure proper safety and work environment as well as the compensation measures to the laborers. By national law, in order to be compensated, contractors must follow these safety provisions and compensation arrangements. The implementing agency must ensure that the appropriate occupational health and safety provisions have been included in the bidding documents and are being implemented by contractor. As per the Safe Drinking Water Supply and Sanitation Policy, 1998, provision for arsenic safe drinking water and adequate sanitation will have to be ensured for the training centers. The water quality needs to be monitored to ensure that the supplied water is safe for drinking.

41. As per categorization, the proposed upgradation and modernization project of the three TTCs fall under the category 'B' for ADB. Category B projects are considered to have relatively minimum environmental impact; hence, an IEE along with the EMP is required to be carried out. It is expected that the building will not be more than six stories and as such, no environmental clearance will be required from the DOE. If a new construction of more than six stories is considered, the IEE and EMP would be required to get the environmental clearance from the DOE as per ECR, 1997.

C. Description of the Project

42. The proposed project is quite straightforward. It will involve extension, upgradation, and modernization of three TTCs in Dhaka, Khulna, and Sylhet. There is no specific project design available right now for reference, but SEIP has planned to build the project based on the previous project that has been done in Dar-us-salam, Mirpur, Dhaka, and at Rajshahi TTC. The project will be designed considering the existing structure of the TTCs and their future extension provision.

1. Bangladesh German Technical Training Centre

43. The BGTTTC is one of the old TTC situated at Mirpur, Section 2, Dhaka. The global positioning system (GPS) location of BGTTTC is 23.802818°N and 90.360143°E. It has been set

up in 1965 by the aid of the German government and later taken over by the BMET under the Ministry of Expatriates' Welfare and Overseas Employment (MEWOE) in Bangladesh on 6.18 acres of land. It has 12 workshops, two computer labs, one science lab, 26 different trades, and 55 teachers with a yearly student intake capacity of around 2,000 in different trade and courses which is far more than its original intake capacity which has happened due to on growing need of such training. This TTC is very old and no vertical expansion is possible but it has adequate space available for lateral expansion. Complete renovation of existing facilities is likely to be carried out given its aged structure. The precise scope and the number of classrooms will be determined based on ongoing feasibility study which prepares detailed scope of training program and technical designs.

44. The location map of the BGTTC has been shown in Figures 1 and 2. The surrounding pictures of the BGTTC has been shown in Figure 3

Figure 1: Location Map of the Project in Satellite Map

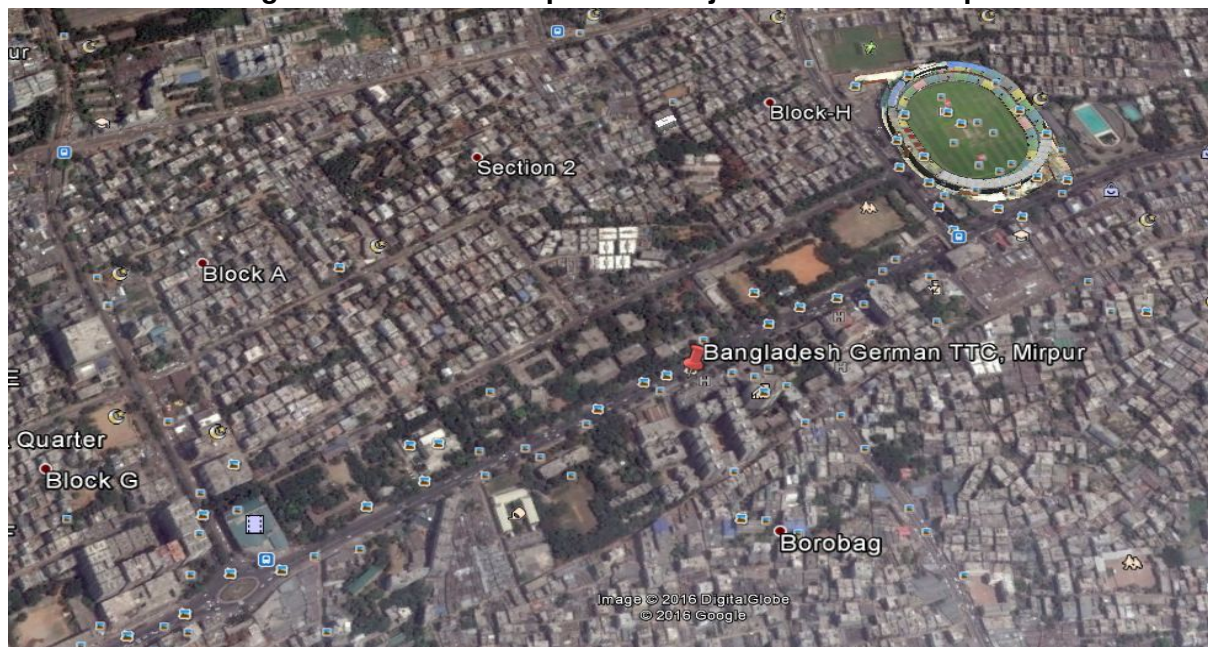
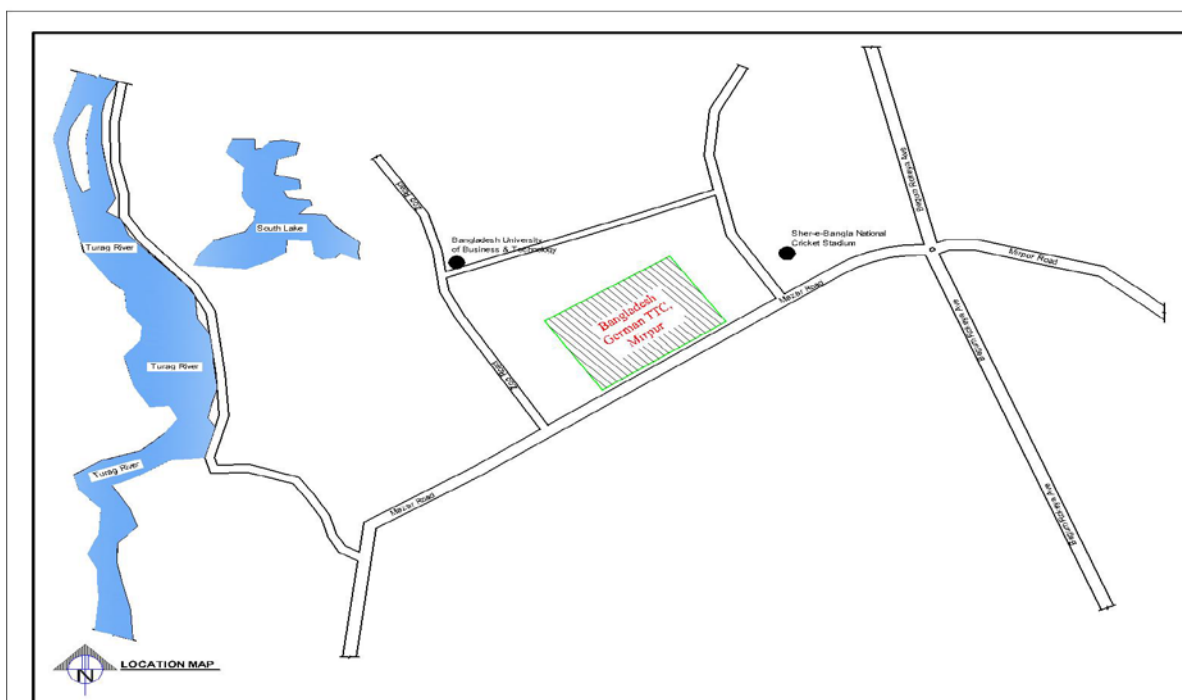


Figure 2: Location Map of the Project**Figure 3: Surrounding Pictures of the Project**

2. Khulna Technical Training Center

45. The KTTC is one of the old TTC situated at Teligati, Khulna. The GPS location of KTTC is $22.897984^{\circ}\text{N}$ and $89.488308^{\circ}\text{E}$. It has been set up in 1984 by the BMET under the MEWOE on 12.51 acres of land. It has 16 workshops, four computer labs, eight classrooms, 16 different trades, and 89 teachers and staffs with a yearly student intake capacity of 1,400 but the KTTC is now enrolling more than 2,000 students with the same facility due to the growing need of such training. This TTC is old and no vertical expansion is possible but it has adequate space available for lateral expansion. Complete renovation of existing facilities is likely to be carried out given its aged structure. The precise scope and the number of classrooms will be determined based on ongoing feasibility study which prepares detailed scope of training program and technical designs.

46. The location map of the KTTC has been shown in Figures 4 and 5. The surrounding pictures of the KTTC have been shown in Figure 6.

Figure 4: Location Map of the Project in Satellite Map



Figure 5: Location Map of the Project

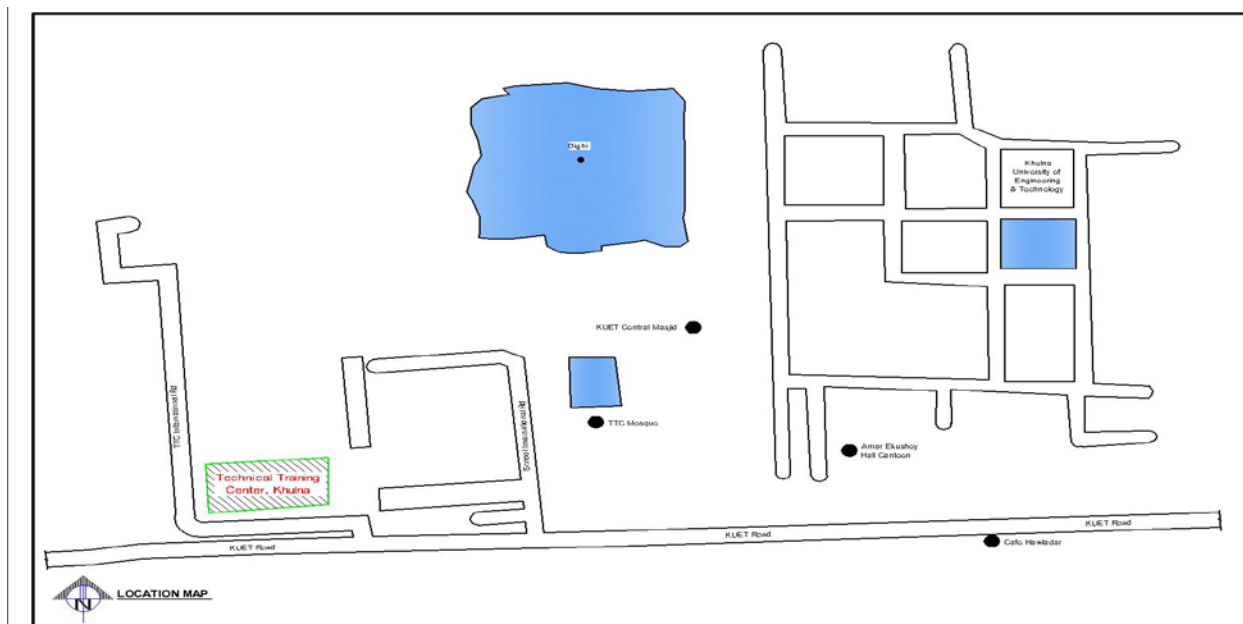


Figure 6: Surrounding Pictures of the Project



3. Sylhet Technical Training Center

47. The STTC is located at Sylhet city on Sylhet-Jokiganj road. The GPS location of the STTC is 24.875200°N and 91.891064°E. It has been set up in 2005 by the BMET under the MEWOE on 1.92 acres of land. It has six trades, seven workshops, one computer lab, six classrooms, seven office rooms, and 46 teachers and staffs with a yearly student intake capacity of 750. This TTC has been designed with modern architecture having facility of vertical and lateral expansion. Complete renovation of existing facilities is likely to be carried out given its aged structure. The precise scope and the number of classrooms will be determined based on ongoing feasibility study which prepares detailed scope of training program and technical designs.

48. The location map of the STTC has been shown in Figures 7 and 8. The surrounding pictures of the STTC have been shown in Figure 9.

Figure 7: Location Map of the Project in Satellite Map



Figure 8: Location Map of the Project

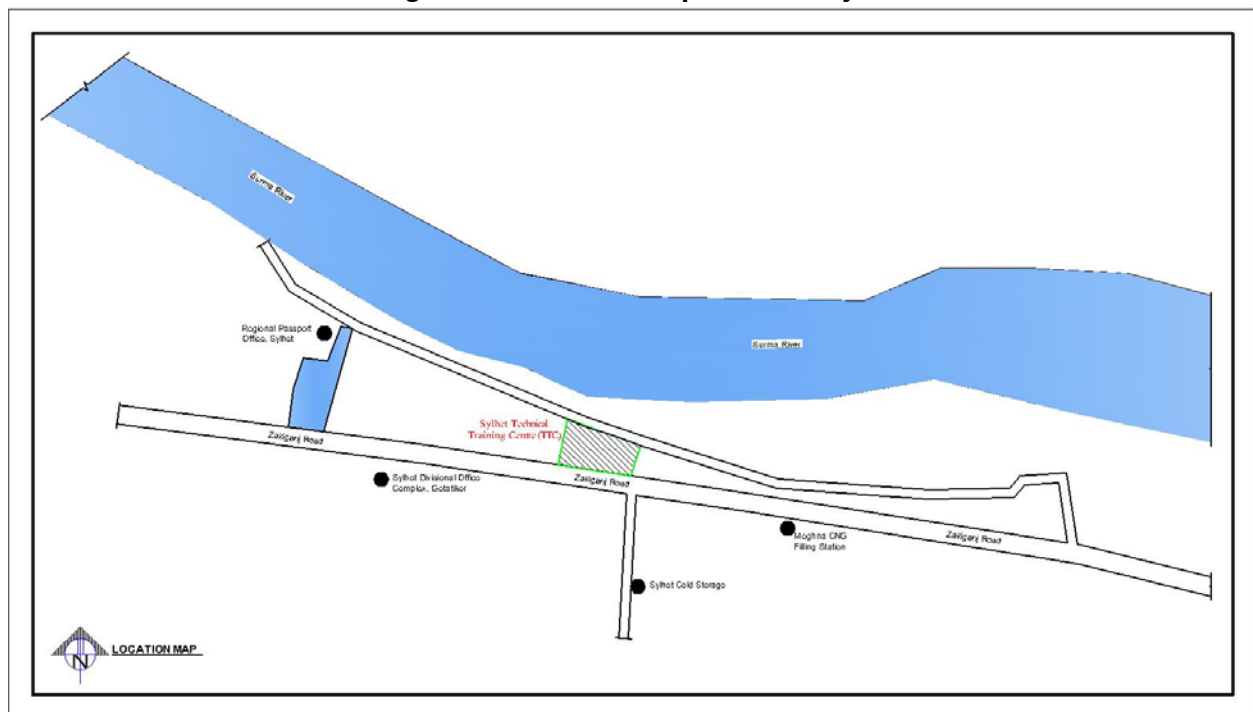


Figure 9: Surrounding Pictures of the Project



III. BASELINE DATA GENERATION

49. Baseline data on environment is important to understand existing physical, biological, cultural, economic, social, and environmental characteristics. This information serves as the basis for identification, prediction, and evaluation of impacts of the project activities. Mainly, there are two principal objectives in examining and defining the existing environment:

- (i) to recognize potential environmental impacts of the project and enable mitigation measures to be identified; and
- (ii) to provide a baseline against which environmental conditions in the future project may be measured and to document conditions which were either existing or developing before the introduction of the project and not due to the project.

50. The baseline environmental quality is assessed through field studies within the impact zone for various components of the environment, viz. air, noise, water, land, and socioeconomic. For the IEE study, the emphasis is given on the environmental features that are of particular significance to the present project. Considerations are given to both the environment and ancillary area that seems to be affected.

A. Bangladesh German TTC

51. The study area covers the entire area of the project which belongs to the BGTTTC Mirpur is located at 23.802818°N and 90.360143° E. Mirpur Thana (Dhaka district), with an area of 53.58 km², is bounded by Pallabi Thana on the north, Mohammadpur Thana on the south, Kafrul and Pallabi Thana on the east, and Savar upazila on the west. The main river is Turag. Mirpur area is an extended part of the Madhupurgarh created in the Pleistocene period.

1. Socioeconomic Conditions

52. According to the population census in 2011, the total population of Mirpur Thana was 1,074,232, where the males constituted 54.2% and females 45.9%. The average literacy rate is 69.0% (7+ years), compared to the national average of 48.6% (male 65.4% and female 52.2%). The type of vehicles running on the roadway are heavy and lightweight vehicles like trucks, bus, scooter, cars, rickshaw, and rickshaw van are running on both the roadway and branch road.

53. Main occupations are agriculture (1.4 %), wage laborer (2.1%), weaving (1.1%), industry (3.1%), commerce (21.2%), service (37.4%), transport (11.0%), house renting out (1.8%), and others (21.0%).

54. Urbanization (100%): residential (32%); commercial (19%); offices (6%); business center, housing, and other establishments (85%); low marshy land (1%); and fallow land (15%). Land control: land owner (35%) and landless (tenants) (65%).

55. According to the Bangladesh Agricultural Research Council (BARC)'s agro-ecological zoning map of Bangladesh, the proposed project area falls in the Old Meghna Estuarine Floodplain. The Old Meghna Estuarine Floodplain is generally between 3 to 10 m above sea-level. The silt loam soils are predominant on the highlands and silty clay in lowlands. Non-calcareous dark grey floodplain soils are the only general type of the area.

2. Physical Environment

56. The climate of this region is tropical, with monsoons, characterized by a change of four seasons: pre-monsoon (March to May), monsoon (June to September), post-monsoon (October to November), and dry season (December to February). The annual rainfall is about 2,000 mm and approximately 80% of it occurs during the monsoon. Average monthly rainfall during monsoon period varies between 300 mm to 450 mm. Maximum daily rainfall during this period was recorded on 13 September 2004 at 341 mm.

57. Relative humidity during the wet season is significantly higher than those occurring at other period of the year. The highest humidity in the period of 2009–2013 was 84% and lowest humidity was 52%. According to the BMD, the average wind speed at Dhaka within March to September is 2.8 knots in 2013. The temperature of the region has the relationship with the period of rainfall. The highest temperature in the period of 2009–2013 was 39.6°C and lowest temperature was 7.2°C.

58. There is no surface water body available near the project site since it is situated in an urban setting. The overall ground water quality in Bangladesh is relatively good. The Dhaka Water and Sewerage Authority abstract ground water by deep tube well in different parts of the city to supply it to the city dwellers which is relatively good in quality.

B. Khulna Technical Training Center

59. Khulna District is located in between 21°41' and 23°00' north latitudes and in between 89°14' and 89°45' east longitudes with an area of 4,395 km². It is bounded by Jessore and Narail districts on the north, Bay of Bengal on the south, Bagerhat district on the east, and Satkhira district on the west. The main water bodies are Rupsa (Bhairab), Arpangachhia, Shibsa, Pasur, and Koyra.

1. Socioeconomic Conditions

60. According to the population census in 2011, the total population of Khulna District was 2,318,527, where the males constituted 1,175,686 and females 1,142,841. The average literacy rate is 60.1%, including male 64.3% and female 55.9%. The type of vehicles running on the roadway are heavy and lightweight vehicles like trucks, bus, scooter, cars, rickshaw, and rickshaw van are running on both the roadway and branch road.

61. According to the Bangladesh Bureau of Statistics (BBS), 2011, the total employed male number is 154,335 and female number is 24,582. Main occupations are agriculture (male 89,334; female 5,872); industry (male 17,842; female 4,715); and service (male 47,159; female 13,995). According to BBS, 2011, the source of drinking water is tap water (2.0 %), tube well (83.7%), and others (14.3%).

62. According to BARC's agro-ecological zoning map of Bangladesh, the proposed project area falls in the Ganges Tidal Floodplain and Gopalganj-Khulna Bills. Soils of the area are predominantly silt loams to silty clay loams on the ridges and clay in the basins.

2. Physical Environment

63. The climate of this region is tropical, with monsoons, characterized by a change of four seasons: pre-monsoon (March to May), monsoon (June to September), post-monsoon (October to November) and dry season (December to February). Annual average rainfall of Khulna is 1,809.4 mm (71.24 in). Approximately 87% of the annual average rainfall occurs between May and October.

64. Relative humidity during the wet season is significantly higher than those occurring in other periods of the year. According to the BMD, the average wind speed at Khulna area within January to December is 2.3 knots in 2013. The temperature of the region has the relationship with the period of rainfall. The highest temperature in the period of 2009–2013 was 40.5°C and lowest temperature was 7.0 °C.

65. Though there was no water quality data available at site but the water quality of the ponds (adjacent to the project site) was found relatively good. Ground water level of the project site exists at a moderate (generally below 8.0 m) depth, which is being recharged mainly by infiltration of rainwater. The depth of hand tube wells for drinking water in the area varies from 40–120 ft (12.33 to 36.70 m).

C. Sylhet Technical Training Center

66. Sylhet District is located in between 24°36' and 25°11' north latitudes and in between 91°38' and 92°30' east longitudes with an area of 3,490.40 km². It is bounded by Meghalaya state of India on the north, Maulvibazar district on the south, Assam state of India on the east, and Sunamganj and Habiganj districts on the west. The main water bodies are Surma, Kushiya, Piyain, and Gorai.

1. Socioeconomic Conditions

67. According to the population census in 2011, the total population of Sylhet District was 2,680,639, where the males constituted 1,330,095 and females 1,350,544. The average literacy rate is 47.3% including male 49.1% and female 45.7%. The study area is situated on the south

side of Surma River. The transportation facilities are available in the study area. The type of vehicles running on the roadway are heavy and lightweight vehicles like trucks, bus, scooter, cars, rickshaw, and rickshaw van are running on both the roadway and branch road.

68. According to the BBS, 2011, the total employed male number is 232,077 and female number is 21,913. Main occupations are agriculture (male 154,767; female 6,922); industry (male 24,462; female 5,171); and service (male 52,848; female 9,820). According to the BBS, 2011, the source of drinking water is tap water (3.7%), tube well (67.8%), and others (28.5%).

69. According to BARC's agro-ecological zoning map of Bangladesh, the proposed project area includes the western part of the Eastern Surma-Kushiyara Floodplain which is predominantly highland and medium highland. General soil types predominantly include calcareous dark grey floodplain soils and calcareous brown floodplain soils. Soils are slightly alkaline in reaction. General fertility level is low.

2. Physical Environment

70. The climate of this region is tropical, with monsoons, characterized by a change of four seasons: pre-monsoon (March to May), monsoon (June to September), post-monsoon (October to November), and dry season (December to February). According to the BMD, the annual average rainfall is about 3,852 mm and approximately 80% of rainfall occurs during the monsoon. Average monthly rainfall during monsoon period varies between 500 mm to 650 mm.

71. The relative humidity rises to above 85% during the wet season. The average humidity of Sylhet is about 75%. The mean annual evaporation is high, with the highest daily figures occurring during March to May when the mean daily temperatures are at their highest. According to the BMD, the average wind speed at Sylhet within March to September is 2.83 knots in 2013. The highest and lowest maximum and minimum temperature in Sylhet varies from 39.6°C in June to 7.7°C in January.

72. The river Surma is situated near Sylhet town. The river water was visually inspected and found to be in good condition. Ground water level exists at moderate (generally below 5.0 m) depth which is being recharged mainly by infiltration of rainwater. Ground water is a stable source of water both for domestic and industrial purposes in this area. Usage of ground water for irrigation is limited here. There is no complaint regarding non-availability of ground water in this area.

IV. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

73. In case for most industrial/infrastructure projects, potential negative impacts sometime could be far more numerous than beneficial impacts. The regional and national economic benefits associated with the implementation of any development project are considered to fall outside the scope of an IEE/EIA, and therefore not considered here. However, it is generally expected that these long-term benefits will ultimately trickle down to the local population and will make a contribution to an improvement in the quality of life.

1. Scoping of Impacts

74. The potential impacts due to the implementation of the project are identified by using simple checklists. This method is described below.

2. Checklist

76. The checklist is a comprehensive list of environmental effects and impacts indicator designed to stimulate the analysts to think broadly about possible consequences of contemplated actions (Munn, 1979). The table below represents the checklists developed for the present project. In this checklist, actions, which may affect the various stages of the project activities, are listed and the degrees of significant environmental impacts are shown. The terms none, minor, moderate and major are used in the checklists to evaluate the magnitude of significant environmental impacts. In the checklist, the location, construction, and operational phases of the proposed development are considered separately in order to distinguish the short term and long-term impacts.

Table 3: Checklist for the Construction of Upgradation Project of Technical Training Centers

Project Phase	Action Affecting Environmental Resources & Values	SEIs without Mitigation Measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
Project Location	Land value depreciation	x						No land value changes anticipated
	Loss of and displacement from homestead land	x						No loss of and displacement from homesteads land; no impact
	Loss of and displacement from agricultural land	x						Loss of and displacement from agricultural land will not occur; no impact
	Damage to nearby operation	x						No impact anticipated
	Disruption to drainage pattern		X			x		Land development may create problems in local drainage pattern; minor impact
	Blockade of wildlife passage	x						No wildlife in the area; no impact
	Encroachment into precious ecological	x						No precious ecological issues; no impact
Construction Stage	Blockade of natural drainage		X			x		Cutting/filling and construction site preparation would create natural drainage blockade during rainy season; minor impact
	Worker accident		X			x		Irregularly may occur in construction period, minor impact
	Safe drinking water and Sanitation hazard			x		x		Concentration of labor force create unhygienic condition; medium impact
	Noise/vibration hazard		X			x		Piling, brick/stone crushing, and equipment installations may create noise; minor impact
	Traffic congestion		X			x		Carrying of construction materials & equipment will create traffic congestion
	Emission of Dust		X			x		Cutting/filling, stockpiling of construction material, and traffic movement may create dust emission; minor impact
	Surface water pollution	x						No water discharge from the site, no impact
	Solid waste management		X			x		Improper management of construction debris and solid waste may pose risk to the neighbors; minor impact
	Occupational health and safety of workers		X			x		Health and safety of workers at site may pose to risk in some cases; minor impact
	Site security		X			x		Improper site security may pose risk to the

Project Phase	Action Affecting Environmental Resources & Values	SEIs without Mitigation Measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
								existing students and staffs or community; minor impact
	Employment			x			x	Major employment opportunity during construction; medium positive impact
Operation/ running Stage	Pollution from liquid discharge	x						No liquid discharge from the project, domestic sewage should be disposed through existing septic tank; no impact
	Pollution from solid waste		X			x		Minor domestic solid waste may generate; minor impact
	Air quality	x						No air pollution; no impact
	Noise hazard	X						No noise generation is expected; no impact
	Traffic congestion	x						No traffic congestion: no impact
	Renewable energy option			x			x	Solar panel may be installed at the roof of the building may save energy and CO ₂ emission
	Socioeconomic impact		X				x	Development skilled training may develop the society and neighborhood.
	Employment			x			x	Medium employment opportunity during operation

B. Beneficial Impacts and Enhancement Measures

75. Potential environmental impacts (both positive and negative) associated with all project phases were identified in Section IV by using the checklist method. The summary of beneficial impacts from the assessment is tabulated below.

**Table 4: Summary Analysis of Beneficial Impacts
Technical Training Centers in Dhaka, Khulna, and Sylhet**

Project Activities		Beneficial Impacts
Pre-Construction		
1. Land Value	-	No land value depreciation Land value enhancement anticipated due to the development
Construction		
2. Employment	-	Major employment opportunity (positive impact)
3. Increasing local business	-	Local business will be enhanced due to the construction activities
Operation		
4. Socioeconomic impact	-	New construction of educational institutes will attain more access and retention of students Increasing skilled training may develop the society and neighborhood Provision of permanent and temporary employment opportunities
5. Landscaping	-	A net increase in green cover would provide increased habitat for birds and small mammals (positive impact)
6. Renewable energy option	-	Solar panel may be installed at the roof of the building to save energy and CO ₂ emission
7. Rainwater harvesting	-	Provision of "rainwater harvesting" systems in the building will meet the water demand

1. Impact at Pre-construction Phase

76. **Land value depreciation and land acquisition.** The proposed project site in the existing TTC premises do not require any relocation of homestead since the project would be implemented at the TTCs' own vacant land or by vertical extension. No precious ecological issue is involved with this project since the project site is barren land, has no natural habitat and is not immediately adjacent to water courses. There will be no land acquisition involved and no land value depreciation.

2. Impact at Construction Phase

77. **Employment.** During construction period, short duration job opportunities for local people will be created. In addition to this, all construction sites attract small traders, who supply food and other consumable to the work force. Although the number of people who benefited in this way is relatively small, the impacts on individuals can be disproportionately high compared to the other local people. Tube wells will be installed during construction.

78. **Benefit maximization measure.** Although labor recruitment is a matter of construction contractor who has the right to determine whom he shall employ, the project proponent should

still encourage hiring local people wherever possible and give preference to employment of landless people. Installation of tube wells will provide safe drinking water facilities to the workers as well as to the students.

3. Impact at Operation Phase

a. Socioeconomic Impact

79. The most significant positive impact of the project would be the development of enhanced skilled training opportunities in the project areas, which will eventually produce more skilled labor force and thus may develop the society and country on a broader scope. The other important positive impact of the project would be the employment of personnel for the operation of the TTCs. Employment may be both permanent and temporary.

80. **Benefit maximization measure.** TTC activities should be reported and monitored to ensure better quality of education.

b. Landscaping

81. A landscape is a subjective concept that cannot be precisely quantified. However, in general, any project, when not designed considering the local landscape, creates visual intrusion to the people. The proposed project has minimal amount of vegetation to be affected due to the construction. A significant net positive effect is possible with the design of the building and its surroundings to accommodate both the building itself and a net increase in green cover on the site.

82. **Benefit maximization measure.** Plantation of trees around the school building i.e., grass and shrubs would provide increased habitat for birds and small mammals and enhance the visual aesthetics of the current land.

c. Renewable energy option

83. Solar power is one of the best renewable energy options. It is the conversion of sunlight into electricity that may be used for supporting electricity demand of the building and for individual outdoor lights by adding some design and budget modifications.

84. **Benefit maximization measure.** Solar photovoltaic (PV) panels are to be installed in the TTC premises or on the roof. It is a low cost sustainable solution to meet the electricity demand.

d. Rainwater harvesting

85. Rainwater harvesting is a technique used for collecting, storing, and using rainwater for landscape irrigation and other domestic uses. The project areas face heavy rainfall almost all throughout the year. Rainwater harvesting may contribute to the solution of water logging problem associated with the heavy rainfall.

86. **Benefit maximization measure.** Rainwater harvesting systems can be installed with minimal skills. Installation of storage tanks on the roof top is the easiest way of rain water harvesting. The water storage tank size should be large enough to contain the captured water and the system should be sized to meet the water demand throughout the dry season

specifically, the rainfall capturing area such as a building roof must be large enough to maintain adequate flow.

C. Adverse Impacts and Mitigation Measures

87. The minor, temporary adverse environmental impacts that have been identified are itemized below, according to each project phase. Most of these relate to the building construction process, and can be relatively easily mitigated with standard best practices that are increasingly being required of the construction industry.

Table 5: Summary of Adverse Impacts
Technical Training Centers in Dhaka, Khulna, and Sylhet

Project Activities	Potential Impacts
Pre-Construction	
1. Land acquisition	- Loss of access to the site (local communities, students, and staff crossing the area); inconvenience
2. Site preparation, clearing, and earthworks	- Clearing of vegetation (minor impact) - Reduction in visual aesthetics of the current land (access road, truck traffic, construction equipment, and eventually a building on site) - Land development may create problems in local drainage pattern (minor impact) - Emission of dust (minor impact) - Improper management of construction debris and solid waste may pose risk to the neighbors (minor impact) - Associated noise (minor impact)
Construction	
3. Influx of workers	- Health and safety of workers at site may pose risk in some cases (minor impact) - Concentration of labor force create unhygienic condition and risk of safe drinking water and sanitation hazard (medium adverse impact) - Improper site security may pose risk to the workers or community (minor impact)
4. Construction equipment/materials	- Piling, brick/stone crushing and equipment installations may create noise (minor impact) - Carrying of construction materials may create traffic congestion (minor impact) - Cutting/filling, stockpiling of construction material and traffic movement may create dust emission (minor impact) - Improper management of construction debris and solid waste may pose risk to the existing TTC staff and students
5. Vehicle and pedestrian traffic	- Slightly more congestion near the main entrance to the TTC (minor impact) - Increased number of vehicles on local roads will result in increased wear and tear of local roads thus reducing lifespan of affected roads (minor impact) - Pedestrians and cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads (minor impact) - There will be an increase of exhaust emission from vehicles, which will pollute local atmospheric air (minor impact)
6. Employment of child labor in construction activities	- The Environmental and Social Safeguard Policies of the DOE and ADB prohibits all kinds of child labor (lower than 14 years) and personnel engagement in construction works of the projects

Project Activities	Potential Impacts
Operation	
7. Vehicle and pedestrian traffic adjacent to the TTCs	- Slight more congestion near the main entrance of the TTCs - Increased number of vehicles on local roads will result in increased wear and tear of local roads thus reducing lifespan of affected roads (minor impact) - Pedestrians and cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads (minor impact) - There will be an increase of exhaust emission from vehicles, which will pollute local atmospheric air (minor impact)
8. Generation of consumables	- Risk of poor solid waste management - Risk of sanitation hazard
9. Increased demand on local services	- Increased risk of water shortages and electricity load shedding
10. Extreme climate events, disasters, and emergency	- Some TTC sites are in flood prone area and Bangladesh as a whole poses to extreme earthquake zone - Fire hazard or any medical emergency may arise during operation of the building

88. Adverse impacts likely to result from implementation of the proposed project and mitigation measures are considered here in Section IV.C.

1. Impact at Pre-construction Phase

a. Land acquisition

89. As discussed earlier, the proposed upgradation project of the TTCs will be built on pre-occupied land and the proposed site is not currently being used for other use or community purposes, or providing natural habitat, so there are no negative environmental effects associated with acquisition of the land for the project to be implemented. Hence, no mitigation measure is needed.

b. Site preparation, clearing, and earthworks

90. The pre-construction phase involves site preparation, clearing of existing vegetation, and some earthworks for levelling the surface. These activities may cause some negative impacts such as (i) change in landscape, (ii) emission of dust, (iii) associated noise, and (iv) improper management of construction debris and solid waste may pose risk to the neighbors.

c. Mitigation measures

91. **Change in landscape.** The proposed project site has some grass and scrub vegetation that will be affected due to the land development. But with completion of the project and planting of new vegetation and trees around the building, the project site should recover the visual aesthetics and also a net gain in green cover is possible as discussed in IV.B.3.b.

92. **Emission of dust and associated noise.** Site preparation activities will generate dust and noise. Both these adverse effects will be short-term and within tolerable limit at the pre-construction stage and can be mitigated. By sprinkling water on dry surface, spreading of dust can be controlled. Working activities should be limited to day time only.

93. **Waste management.** Construction debris and wastes should be properly collected and disposed to a safe place designated by municipal corporations.

2. Impact at Construction Phase

a. Site preparation, clearing, and earthworks: disruption of earth surface

94. Construction activities and possible impacts are temporary impacts associated with the construction work. As soon as the construction phase is finished, the impacts will be neutralized but some standard manner of construction can mitigate the effects in the construction phase.

95. **Mitigation measures.** Cutting and filling operation should be kept at minimum. The proponent should ensure construction of proper drainage facility. Regular water sprinkle should be used to minimize fugitive dust emission. Safe working procedures should be ensured by the contractor. Most appropriate time for undertaking construction work is during the dry season. The heavy equipment should be operated at day time.

b. Potential environmental impacts of dust

96. The air quality in the project area may slightly deteriorate for the time being during construction mostly due to dust emission. Dust produced will potentially negatively affect the following: (i) employees, generally construction workers; (ii) TTC students, teachers, and general public; and (iii) vegetation.

97. Though the emissions are temporary and not expected to contribute significantly to the ambient air quality and will be within prescribed limits for industrial regions by the National Ambient Air Quality Standards, necessary measures are to be taken.

98. **Mitigation measures.** Regular sprinkling of water on open surface and dust emitting grounds should be done regularly until paving is done during the dry season and keeping all soil, sand, and aggregate piles covered (whether on the site, or on trucks) to minimize the air pollution during the construction stage. If there is any complain of dust emission from students, teachers, and neighbors, this should be given proper attention. The project activity is very small and TTC has adequate space within their boundary, so, the dust emission would not cause harm to any receptor nearby, moreover, there is no sensitive receptor in the area.

c. Potential environmental impacts of noise

99. Construction works may cause objectionable noise nuisance to workers, students, or teachers.

100. **Mitigation measures.** For managing noise nuisance, construction works should be limited to daytime hours and all employees likely to be exposed to noise must use ear protectors. TTC authority and students must be notified in writing on the date of commencement of construction work at least 1 month in advance. Where applicable and possible, exceptionally noisy machines should be fitted with noise reduction devices. However, the noise impacts will be local; limited to the premises and very short-term. The project activity is very small and TTC has adequate space within their boundary, so, the noise emission would not cause harm to any receptor nearby, moreover, there is no sensitive receptor in the area.

d. Waste management

101. Improper dumping of spoil materials and solid wastes may cause environmental degradation of the TTC area. Students, teachers, and neighbouring people will face problems like: (i) bad smell, (ii) aesthetically unpleasant environment, (iii) diseases, (iv) etc.

102. **Mitigation measures.** Introduction of proper solid waste management system at site is necessary. Human generated wastes may be controlled by raising awareness among workers on solid waste management with waste minimization, recovery, and recycling. Specific dumping containers are to be kept at site. All waste materials should be disposed in proper places (designated dumping yard of municipal corporation) after completion of construction.

e. Sanitation hazard and drinking water

103. The health of the project personnel, construction workers, and laborers living at the site could be impacted if arrangement of sanitation and drinking water is not ensured adequately and properly. During construction stage, lots of local labors will work and hence they would generate considerable amount of human waste. These are the potential source for spread of diseases, as various insects will play a dominating role. There are chances for the spread of waterborne diseases also.

104. **Mitigation measures.** Proper sanitation system should be provided and at the same time, regular, proper, and safe disposal of human waste should be ensured. Contractors and workers should obey appropriate means of waste removal and sanitation measures. Adequate number of toilets and bathrooms should be made for the workers, and proper disposal system (septic tank) of sewage waste should be implemented for sanitation purpose and the workers should be aware to practice those facilities.

105. The project activities shall make higher demand on the local utilities and service facilities particularly potable water, health and sanitary facilities. There should be sufficient number of tube wells for drinking purpose.

f. Occupational health and safety of workers and students

106. Health and safety issues associated with construction activities will be an issue for workers, students, teachers, and others. Under controlled situation, accident is not expected. However, occasionally, accident may occur during earth cutting, casting, construction works, and installation of heavy machinery. The protection of head, eye, ear, hand, and foot of the workers, laborers, and project personnel could be affected if proper and adequate arrangement is not ensured.

107. **Mitigation measures.** The workers should wear personal protective equipment, safety goggles, and other necessities. The whole work site will have to be fenced off and marked, so as to prevent the access of TTC student, staffs, and neighbors to the construction site. When land clearing is complete, the work area is finished, and facilities are in place, all of the above impacts and risks will be neutralized.

g. Increase in vehicular traffic in the area

108. Increase in vehicular traffic in the area is likely to be experienced during construction phase of the upgradation project because of trucks ferrying in construction materials and

carrying waste materials from the site. The following are the impacts likely to occur due to increased traffic:

- (i) slightly more congestion near the main entrance to the TTCs;
- (ii) increased number of vehicles on local roads will result in increased wear and tear of local roads thus reducing lifespan of affected roads;
- (iii) pedestrians and cyclists using local roads will have to exercise more care with increase of vehicular traffic on the said roads; and
- (iv) there will be an increase of exhaust emission from vehicles, which will pollute local atmospheric air.

109. **Mitigation measures.** The TTCs are located in the district town area where there are multiple road access to the site. So, the contractor should use the road which is not so busy and carry the materials during off-peak hours. So, the traffic-related congestion and air pollution would not be an issue in this case.

h. Extreme climate events and disasters

110. Design and construction of the upgradation projects in the TTCs should consider 'climate proofing design' to combat flood and earthquake.

111. **Mitigation measures.** Raising plinth level for flood and earthquake resistant design should be incorporated in design consideration of the building. Alternative solutions and final designs should be subject to expert and community consultation.

3. Impact During Operation Phase

112. There are few adverse environmental impacts expected with operation of the upgradation project.

a. Increased demand of electricity and water

113. The building will require services (notably water and electricity), which could cause additional demands during periods of low water availability and grid load-shedding.

114. **Mitigation measures.** The proposed building design features that address water and energy conservation (described above in IV.B.3.c and IV.B.3.d) would help considerably in this regard.

b. Impact due to solid waste

115. Operation of the new building will result in production of solid waste, which will require careful storage, separation, and handling. It is important that sewage from the building should not be an issue to the community.

116. **Mitigation measures.** Properly marked waste containers should be available at each floor and outside the building. All solid waste will be segregated properly. Some solid waste may have secondary use and these will be sold to the secondary dealers. Other solid wastes will be disposed to the safe places carefully. Regular cleaning of wastes is essential. Sweeping and washing should be done every day to provide students a waste-free, healthy environment.

c. Impact due to liquid discharge

117. The building will not create any process liquid. The liquid discharge will be mainly water used for domestic and toilet uses.

118. **Mitigation measures.** The domestic liquid waste will be disposed through the existing septic tank already built for the existing building or to the sewer line (for BGTTC only). The project will have a planned drainage system to discharge the surface run-off.

d. Emergency response

119. The initial response to an incident is a critical step in the overall emergency response. The TTCs must have adequate measures against accidents or incidents to meet the emergency.

120. **Mitigation measures.** The stairs of the building will be well designed and adequate for easy passage of the occupants. Fire safety management training and mock drill should be practiced periodically and emergency equipment and facilities like fire extinguisher/water hose, first aid, etc. must be available to manage fire hazard or any medical emergency.

V. ANALYSIS OF ALTERNATIVES

121. **The 'no build' scenario.** From a purely physical environmental point of view, the 'do-nothing' is preferable to any project implementation, since it would avoid creation of any of the adverse impact associated with the project. However, It is concluded that the 'No Build' alternative is unacceptable, and the potential socioeconomic benefits of implementation of such project far outweigh the adverse impacts, all of which can be controlled and minimize to an allowable level.

A. Consideration of Alternatives

1. 'No build' alternatives

122. The 'No Build' alternative in the present case would mean there would be shortage of classrooms and other training facilities in the selected TTCs. So, the 'No build' alternative is unacceptable.

2. Skilled Training Sector Development

123. New building construction for the selected TTCs will ensure more access to students and retention of students. Thus, it will help in the development of skilled training in the TTCs and will contribute in building a more efficient nation.

3. Employment Opportunity

124. The project will create some employment opportunity during construction. There are possibilities to employ local people and thus may contribute to the development of financial status of those people, though this will be a short duration benefit.

B. Site Alternatives

125. The project has been designed to provide enhanced skilled training opportunities to the selected TTCs. So, there is no logic to find an alternative site for the project since it is in the existing school premises.

VI. INSTITUTIONAL ARRANGEMENTS

A. Introduction

126. As discussed earlier, construction of the TTC upgradation project is an infrastructure development project of SEIP, a skilled training enhancement program by the Ministry of Finance. The project is jointly being financed by the Government of Bangladesh and ADB. The institutional arrangement for the construction and operation of the project will be discussed in this chapter.

B. Institutions Associated with the Project

127. The Ministry of Finance is the relevant ministry under which the SEIP has been formed and thus implementing the project by allocated public funds from the government under a loan from ADB. The SEIP will give the responsibility of planning, designing, implementing, and supervising the construction of the said project to their selected contractor and consultants by bidding. The operation of the said projects will be managed by the respective TTC management and periodically supervised by the SEIP. Building contractors will be responsible to take all the necessary measures adopting the Environmental Code of Practices during construction period. The implementation of the EMP and/or Environmental Code of Practices by the contractor(s) is to be supervised by the construction supervision consultant, in close consultation with the project implementation unit of the SEIP.

C. Institutional Capacity of Executing and Implementing Agency

128. The Skills Development Coordination and Monitoring Unit is the implementing agency of this project. The agency is mainly responsible for planning, designing, and construction of all works. There is no institutional set-up, position, or assigned personnel looking after environmental safeguards issue. An environment unit shall be established at the central office of the planning cell of the SEIP under the ministry. An environment focal person from SEIP will be appointed in the environmental unit of SEIP who will cover environmental safeguard issues, including mainstreaming of environmental best practices, coordinating environmental management activities in TTC programs, and facilitating capacity building activities of central and local level stakeholders. He will also be responsible for planning, assessment, implementation, monitoring, and reporting of the EMP.

129. It is recommended that the environmental team have a useful conversation with the local communities regarding activities that have potential environmental impacts. Environmental management is likely to be most successful if such decisions are taken in consultation with the local community. During the operation period of the project, the TTC committee should establish own monitoring team headed by the principal.

D. Key Responsibilities of Executing and Implementing Agency

130. The following are the key responsibilities of the executing and implementing agency:

- (i) The program director or his assigned official at the SEIP will be responsible for overall environmental compliance.
- (ii) The assigned engineer of SEIP will be responsible for project-specific environmental compliance and relevant reporting in SEIP assessment in order to prevent adverse environmental impacts and other climate and disaster-related risks.
- (iii) The SEIP will be responsible for preparing site-specific IEE and EMP for each project, obtaining and ensuring clearance required from government or local government agencies/committees, if necessary.
- (iv) Student-friendly (with proper light and ventilation), aesthetically pleasing, and environmentally sound training premise shall be promoted by the SEIP.
- (v) Provision for adequate sanitation facilities shall be provided for the teachers and students with regular cleaning and routine maintenance. The toilets for girls and boys shall be separate with privacy and water facility.
- (vi) The design should harmonize with local surroundings, including landscaping and planning for other uses for all additionally created spaces, proper ventilation, and lighting in order to minimize negative impacts on environmental quality and property values.
- (vii) Alternative solutions and final designs should be subject to public and community consultation with special emphasis on students/teachers. The preference of students and teachers will be given priority in designing the infrastructure.
- (viii) All areas and infrastructure affected during construction should be restored to their original condition, specially sidewalks, green street dividers, green-belt/fence, gardens, sidewalk trees, utilities, and side streets impacted by traffic diversion.
- (ix) Annual water quality monitoring of all the installed tube wells under the project and existing ones will be carried out to ensure safe drinking water facilities to the students and teachers. Rainwater harvesting could be promoted by the SEIP.

E. Key Responsibilities of the Contractor

131. The SEIP is responsible to implement the overall EMP. However, during the construction stage, the construction contractor is responsible for the safe environment of the project area during the construction. In this context, the EMP should be included into the bidding documents of all the construction packages so that it serves as a condition of contract for adopting the Environmental Code of Practices by the prospective contractor(s). The implementation of the EMP and/or Environmental Code of Practices by the contractor(s) is to be supervised by the construction supervision engineer, in close consultation with the project implementation unit of SEIP. The responsibilities of the contractor will be as follows:

- (i) provision of adequate healthcare facilities (first aid) within construction sites;
- (ii) training of all construction workers in basic safety; sanitation and healthcare issues; specific hazards of their work; personal protection equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles and ear protection;
- (iii) safe drinking water for all workers;
- (iv) safe access across the construction areas;
- (v) arrangement for water spray at the construction area throughout the construction time;

- (vi) ensure that no child labor will be deployed;
- (vii) ensure proper site security and prohibit the construction area from access of general public;
- (viii) keep work areas clean and tidy; and
- (ix) ensure that there is adequate provision of correctly marked waste containers made available at convenient locations for the disposal of wastes.

F. Capacity Building and Training

132. For proper implementation of the EMP, qualified manpower is absolutely essential. There should be a core group of people in the project who will be well trained on environmental issues but all staffs involve with the project should be given basic training on environmental issues. The skills of staff should be upgraded periodically through need based training program. Students and teachers should be given training periodically to ensure a better environment in the TTCs.

VII. ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING

A. Introduction

133. In the context of a project, the environmental monitoring and management plan is concerned with the implementation of the measures necessary to minimize and offset the adverse impacts and to enhance beneficial impacts. Unless the mitigation and benefit enhancement measures are identified in the IEE and fully implemented, the prime function of the IEE cannot be achieved. Thus, the objectives of environmental monitoring and management plan for the present project are:

- (i) identification of monitoring requirements and monitoring indicators;
- (ii) mitigation measures to reduce or eliminate negative impacts; and
- (iii) enhancement measures to maximize positive impacts.

134. Monitoring performance of a project is very important and sometimes vital. For surveillance of the environmental performance of a project and monitoring of the quality of the local environment, environment in the work zone and the general impact zone have to be performed appropriately. For an upgradation project, monitoring is mainly important during the construction phase. The SEIP is responsible to implement the overall environmental monitoring and management plan. However, during the construction stage, the contractors are responsible to mitigate all environmental impacts related with the construction activities.

135. The cost of the EMP has to be divided into several parts to reflect the different phases of the project and the requirements of each phase. The cost of EMP must include the costs of the capacity building, public consultation, and the quality control requirements; and the budget allocation should be made in the yearly operational budget of the plant.

B. Environmental Management Plan

136. All beneficial and adverse impacts which may likely occur at different phases of the project have been discussed with appropriate measures in Section V. In view of the earlier discussion, an environmental monitoring and management plan has been prepared.

Table 6: Environment Management and Monitoring Matrix

Activity	Environmental Impact	Mitigation/Benefit Enhancement Measures	Responsibility	Monitoring Agency
During Construction Phase				
Construction work/use of equipment/materials	Impact on air quality	- o Regular watering should be done. - o All soil, sand, and aggregate piles should be covered (whether on the site or on trucks). - o The sand and other such dispersible material must be removed after completion of work.	Contractor	PD/SEIP
	Noise/vibration hazard	- o Construction works should be limited to daytime hours. - o All employees likely to be exposed to high noise must use ear protectors. - o TTC authority and students must be notified in writing on the date of commencement of construction work at least one month in advance. - o Provide sufficient buffer strip around the project site. - o Proper acoustically-designed machinery should be used. - o Avoid noisy operation during school time.		
	Waste management	- o Awareness must be raised among workers on solid waste management. - o Specific dumping containers are to be kept in the site. - o All waste materials should be disposed in proper places after completion of construction.		
Influx of workers	Impact on health and safety	- o The workers should wear PPE (Personal Protective Equipment), safety goggles, and other necessities. - o Set up warning signs, signals and provide helmets for workers in accordance with relevant accident prevention and work safety procedure. - o Restrict access to the construction site.	Contractor	PD/SEIP
	Sanitation hazard and impact on drinking water	- o Supply good quality drinking water to the workers by installing tube well. - o Provide well-planned sanitary facilities. - o Provide regular health inspection among workers. - o Promote health education campaign among workers.		

	Impact on employment and family finance	- o Employ local people wherever possible. - o Ensure child labor is not employed.		
Increased vehicle and pedestrian traffic	Traffic congestion, impact on safety	- o Avoid carrying of materials in peak hours of road traffic. - o Provide adequate parking for vehicles. - o Raise awareness among all users to follow traffic rules.	Contractor	PD/SEIP
Climate extremities due to geographic location	Impact on design consideration	- o Raise the plinth level of building to prevent from flood. - o Use appropriate materials in design.	Contractor	PD/SEIP
During Operation Phase				
Increased demand of electricity and water	Impact on water and electricity supply	- o Install solar PV panels for electricity generation. - o Introduce "Rain water Harvesting" system. - o Energy efficient lights can be used. - o Electric fan, light and other appliances should be checked periodically and if problem is found, it should be fixed immediately.	Principal/ TTC management	SEIP
Generation of more consumables	Impact due to Solid Waste	o Collect all solid wastes properly, recycle where possible and dispose in proper place.	Principal/ TTC management	SEIP
	Impact due to liquid discharge	o Dispose all domestic waste water through existing septic tank or sewer.	Principal/ TTC management	SEIP
Increased vehicle and pedestrian traffic	Additional need for parking, impact on safety	- o Provide adequate parking for vehicles. - o Raise awareness among all users to follow traffic rules.	Principal/ TTC management	SEIP
Need for proper sanitation and drinking water	Impact on sanitation and drinking water	- o Supply good quality drinking water to the students and teachers. - o Check the quality of drinking water. - o Provide well-planned sanitary facilities. - o Separate washrooms for boys' and girls' should be available maintaining proper privacy.	Principal/ TTC management	SEIP

Socioeconomic impact	Impact on skilled training	o Training programs should be reported and continuously monitored.	Principal/ TTC management	SEIP
	Impact on employment & family finance	- o Employ local people wherever possible. - o Avoid child labor employment.	Principal/ TTC management	
Landscaping	Enhancing visual aesthetics and environmental quality	o Plant trees around the project site.	Principal/ TTC management	SEIP
Emergency management	Fire hazard or any medical emergency	- o First aid facilities should be available. - o Firefighting equipment must be present. - o Fire safety management training and mock drill should be practiced periodically.	Principal/ TTC management	SEIP

C. Environmental Management Plan during Construction Phase

1. Overview of Impacts and Mitigation Measures

137. The following impacts are the most significant in the construction phase: (i) impacts on air quality, (ii) noise and vibration impacts, (iii) waste management, (iv) occupational health and safety, and (v) sanitation hazard.

2. Air Quality Management

138. Contractor must ensure regular sprinkling of water on dusty surface and covering of all dispersible materials to mitigate spreading of dust. Air quality will be monitored during construction.

3. Management of Solid Wastes

139. The project contractor need to ensure that properly marked solid waste containers are available at the project site and should motivate the workers to keep the site clean. Collected wastes will be disposed in proper place after the construction period daily.

4. Noise and Vibration Level Management

140. Adequate measures have been proposed for the control of noise and vibration in previous discussion. Noise level monitoring would be performed periodically and the workers exposed to noise should have adequate protective device.

5. Health and Safety Management

141. The project construction contractor is responsible for ensuring safe workplace for all: the workers, affected students, teachers, and others. Access to workplace must be restricted to provide higher degree of safety and people working in the site must wear personal protective equipment. In case of any medical emergency, adequate health care facilities must be available. Since the project area is frequently affected by flood and earthquake, the building design should consider these disaster issues.

6. Sanitation Management

142. Adequate toilet facilities and safe drinking water must be available at the construction site. The project contractor will ensure proper sanitation of the site. Tube well will be installed for safe drinking water purpose.

7. Increased vehicle and pedestrian traffic Management

143. Adequate traffic sign and speed limit should be provided. Carrying equipment and material during day time or pick hour should be avoided. Adequate parking should be provided. Raise awareness among users to follow traffic rules.

D. Environmental Management Plan during Operation Phase

1. Overview of Impacts and Mitigation Measures

144. Operation phase of the upgradation project of the TTCs do not have much significant adverse impacts on the surrounding environment. The beneficial impact of the project is mainly in socioeconomic point of view. Local staff of SEIP will monitor the impacts of the project in operation phase and TTC principal will continuously monitor the TTC activities during operation of the building. The impacts are mainly: (i) water and wastewater management, (ii) socioeconomic impact, (iii) greening program, (iv) TTC environment, (v) solid waste management, and (vi) disaster management.

2. Water and Wastewater Management

145. The proposed project would have water use mainly for domestic purpose. Water will also be needed for plants around the project building. All domestic sewage will be disposed through the septic tank. The quality of drinking water must be checked annually to check the acceptability of water free from arsenic and other contamination.

3. Socioeconomic Impact Management

146. The main purpose of this development project is to provide enhanced skilled training facilities to use for the TTCs. This will ultimately strengthen the skilled training facility in Bangladesh. The TTC principal and a local staff from SEIP will monitor the performance of the project.

4. Greening Program

147. A green belt development program with different kinds of trees would be undertaken. The vegetation would purify the air, reduce noise level, maintain ecological balance, and generally contribute to the scenic beauty of the air. Soil in and around the plant site is fertile and plenty of water is available. Hence, the green belt as an environmentally sound and friendly project with a buffer zone surrounding the plant area may be created in a short time and therefore green area will be increased and reduce the environmental impacts.

5. TTC Management

148. The environment of TTCs must be student friendly and environmentally sound. Condition of classrooms and environment of TTC should not be such that students face difficulty to concentrate on training. Therefore, ensuring good environment in TTC and proper management of TTC activities is essential. TTC management and SEIP both will give effort to ensure better education environment in the selected TTCs.

6. Solid waste Management

149. The domestic solid waste should be collected properly, segregate & recycle as much as possible. Finally dispose the remaining wastes to the designated dumping yard of the respective municipal corporations.

7. Disaster Management

150. The disaster management plan should 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 the school office as “no smoking zone”; (v) mock drills by the fire fighting cells/ groups, disaster management trainings among students and teachers, etc.

E. Monitoring Requirement

151. Environmental monitoring is an essential tool in relation to environmental management as it provides the basic information for rational management decisions. The prime objectives of monitoring are:

- (i) to check on whether mitigation and benefit enhancement measures are actually being adopted and are providing effective in practice;
- (ii) to provide a means whereby impacts which were subject to uncertainty at the time of preparation of the IEE, or which were unforeseen, can be identified, and steps to be taken to adopt appropriate control measures; and
- (iii) to provide information on the actual nature and extent of key impacts and the effectiveness of the mitigation measures which, through a feedback mechanism, can be taken into account in the planning and execution of similar projects in the future.

152. There are two basic forms of monitoring: (i) visual observation or checking, coupled with inquiries; and (ii) physical measurement of selected parameters.

153. In the phase of construction, monitoring of some selected parameters like air, water, noise, etc. is done by physical measurement. It should be mentioned here that the monitoring program should ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if unwarranted complaints are made.

F. Monitoring Indicators

154. Environmental monitoring requires a set of indicators that could be conveniently measured, assessed, and evaluated periodically to establish trends of impacts. The monitoring program, in view of the possible impacts as assessed earlier, should consider the indicators for the impact assessment related to following issues is presented in Table 7 in the following page.

155. It is desirable that the mitigation measures for the negative impacts and environmental enhancement for positive impacts are implemented according to the suggestions presented in this report. There are two types of environmental monitoring activities associated with the project, during construction and during operation of the project. Each of the components is to be dealt with according to the requirement of suggested measures.

1. Monitoring During Construction

156. The environmental monitoring during the construction phase should primarily be focused on addressing the possible negative impacts arising from:

- (i) generation and disposal of sewage, solid waste and construction waste;
- (ii) increased traffic;
- (iii) generation of dust (particulate matter);
- (iv) generation of noise; and
- (v) deterioration of water quality.

157. The environmental monitoring should also focus on enhancing the possible beneficial impacts arising from employment of local workforce for construction works. The contractor will be responsible for the monitoring during construction and submit monitoring report to SEIP and other organisations as suggested in the EMP report. The TTC and SEIP should regularly monitor the contractor. The cost of the monitoring should be added in the construction cost prior to the bidding. Table 7 summarizes the potentially significant environmental parameters needed to be monitored during the construction phase.

Table 7: Monitoring Plan during Construction Phase of the Project

Issue	Parameters	Location	Monitoring Frequency
Ambient air Quality	PM10, PM2.5, SPM, NOx, SO2	Around the project site	Once a quarter
Ground water	pH, TDS, Ammonia, Nitrate, Phosphate, As, Fe, Mn, and Coliforms	At the project site	Once in 6 months
Noise level	Noise at different locations and to nearest receptor	Around the project site and nearest receptor	Once a quarter
Health	Health status of the workers, visual observation, and record check	At site	Once a quarter

2. Monitoring During Operation

158. Post construction monitoring is limited to a number of impact parameters to see the actual performance of the project. Most of the impacts can be monitored by visual observation or checking with inquiries. Rainwater harvesting and solar lighting system will be monitored by visual observation on an annual basis by SEIP.

159. The TTC management and principal will be responsible for overall environmental monitoring during the operation phase of the school building.

160. Table 8 summarizes the potentially significant environmental parameters needed to be monitored during the operation phase.

Table 8: Monitoring Plan during Operational Phase of the Project

Issue	Parameters	Location	Monitoring Frequency
Groundwater	pH, Ammonia, Nitrate, Phosphate, As, Fe, Mn, and Coliforms	Near project site	Once a year
Solid waste management	Visual observation	At the project site	Once a year
Emergency devices	Fire extinguisher and other health and safety issues	At the project site	Once a year

G. Cost of Monitoring

161. The following are the cost of monitoring for the environmental parameters during construction and during operation period of the proposed TTCs respectively:

Table 9: Cost Estimate for Environmental Monitoring Measures during Construction Phase of the Project

Item	Parameters	Unit Cost (Taka)	Unit per Year	Total Cost per Year (Taka)
Ambient air Quality	PM10, PM2.5, SPM, NOx, SO2	25,000.00	04	100,000.00
Groundwater	pH, Ammonia, Nitrate, Phosphate, As, Fe, Mn, and Coliforms	15,000.00	02	30,000.00
Noise level	Noise at different locations	10,000.00	04	40,000.00
	Total Cost			170,000.00

Table 10: Cost Estimate for Environmental Monitoring Measures during Operational Phase of the Project

Item	Parameter	Unit Cost (Taka)	Unit per Year	Total Cost per Year (Taka)
Groundwater	pH, Ammonia, Nitrate, Phosphate, As, Fe, Mn, and Coliforms	15,000.00	01	15,000.00
Solid waste management	Visual observation	At the project site	Once a year	5,000.00
Emergency devices	Fire extinguisher and other health and safety issues	At the project site	Once a year	5,000.00
	Total			25,000.00

VIII. INFORMATION DISCLOSURE, PUBLIC CONSULTATION, AND PARTICIPATION

162. Public consultation is a means of involving all primary and secondary stakeholders in decision-making process in order to address their concerns, improve project design, and give the project legitimacy. Public consultation, if conducted in a participatory and objective manner, is a means of enhancing project sustainability.

163. Community input (both of knowledge and values) on socioeconomic and environmental issues can greatly enhance the quality of decision-making. The project will be implemented inside the TTC premises, either vertical extension or on the existing empty space. A pre-consultation among the teachers, TTC staffs, and students have been carried out during the site visit at June 2015 and further consultations will be carried out during detailed design stages of the facilities. During the pre-consultation, everybody was so positive about the SEIP's initiative to upgrade the TTCs. They have previous idea about the activities since they are familiar of

such activities in the past by the different agencies. But they have emphasized on adopting standard procedures and practices during the construction of the project.

IX. GRIEVANCE REDRESS MECHANISM

164. The TTC authority has already been consulted for the environmental concerns. However, if any unforeseen issues may occur, to settle such issues effectively, an effective and transparent channel for lodging complaints and grievances will be established. The grievance redress mechanism should be scaled to the risks and adverse impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and transparent process. It should also be readily accessible to all sections of the community at no cost and without retribution.

165. The grievance mechanism will be implemented during the construction and operational period of the project to ensure that all complaints from local communities are dealt appropriately, with corrective actions being implemented, and the complainant being informed of the outcome. It will be applied to all complaints from affected parties. The mechanism will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple means of using this mechanism, including face-to-face meetings, written complaints, and telephone conversations should be available. Confidentiality and privacy for complainants should be honored where this is seen as necessary or important.

169. A grievance redress mechanism and procedures is set up to provide opportunity for project-affected persons to settle their complaints and grievances amicably. The established grievances redress procedures and mechanism ensures that project affected persons are provided with the appropriate compensations and that all administrative measures are in line with the law. It also allows project affected persons not to lose time and resources from going through lengthy administrative and legal procedures. Grievances are first preferred to be settled amicably.

170. There will be a need to set up a separate GRC for each TTC that will address any complaints during the construction and operational period of the project. The GRC committee should be formed with the representative from the TTC management, SEIP, contractor, community leader, and the local government. The committee will (i) convene when they receive any complain from any source; (ii) resolve the problem; and (iii) update the compliant about the outcome.

X. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

171. The present IEE report finds that though there are certain adverse environmental impacts associated with the implementation of upgradation project of TTCs, these are manageable provided recommendations in the EMP are followed with due diligence.

172. The project is indispensable in view of the current skilled training scenario at the selected TTCs. The impact on the social environment is positive given the skilled training sector at TTCs will be developed and more access opportunities will be created for local students from the project. The project will help in the socioeconomic growth and improving quality of skilled training facilities in the project area.

173. One of the most critical issues for the project is safety. This has been adequately addressed through compliance with the Bangladesh National Building Code in the construction to ensure safety during natural disasters like earthquake.

174. The project has been designed to comply with the country's environmental laws and regulations, especially on air emissions, ambient air quality, wastewater effluent, and noise. The project management has taken steps to ensure that the project meets ADB's environmental standards.

B. Recommendations

175. In order to manage the potential adverse environmental impacts, especially in the construction phase of the project, the recommendations provided in the EMP should be followed with due diligence. Some of the important actions required are:

- (i) activation of the environmental monitoring committee, holding of its regular meeting and preparation of the monitoring report;
- (ii) activation of the emergency management and safety committee and holding of its regular meeting;
- (iii) training of staff on EMP-related issues;
- (iv) activation of the GRC and prompt response to public complaints; and
- (v) allocation of adequate resources in the yearly budget for implementation of the EMP.

176. However, the most important issue is the commitment for the implementation of the actions required under the EMP by the management.