Initial Environmental Examination

September 2013

IND: Supporting Human Capital Development in Meghalaya


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ABBREVIATIONS

ADB – Asian Development Bank
DOE – Department of Education
DPCU – district project coordination unit
IEE – initial environmental examination
PMC – project management consultant
SMC – school management committee
SPS – safeguards policy statement
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EXECUTIVE SUMMARY

1. The Laitumkhrah Assamese Secondary School is located in Shillong, the capital city of Meghalaya. Shillong is located in the East Khasi Hills district. The Laitumkhrah Assamese Secondary School was established in 1939. It currently runs classes from grades VI to X. The students belong to poor families and pay very nominal fees. Being a government-aided private school, the school only gets limited salary support from the Government of Meghalaya (GOM). Since it does not get any infrastructure development support from GOM, the school building and classrooms have become very old over the years. The overall school infrastructure is far below the standards prescribed under the Rashtriya Madhyamik Shiksha Abhiya, India’s National Secondary School Mission.

2. The Laitumkhrah Assamese Secondary School is one of the secondary schools which has been selected for upgrading under the Asian Development Bank (ADB) funded “Supporting Human Capital Development in Meghalaya.” An initial environment examination (IEE) has therefore, been undertaken to ensure that the environmental rules and regulations prescribed by the Government of India, GOM, and ADB are adhered to while undertaking the civil works to upgrade the school.

3. The findings and conclusions of the report are based on an analysis of the information collected during field visits to the project area and data collected through secondary sources such as the Forest Atlas, published data from the government and GOM from 2001 population census statistics data, and relevant project documentation received from regulatory authorities and other government departments.

4. The Laitumkhrah Assamese Secondary School has an Assam type construction, i.e., timber frame with bamboo intermediate in the panels plastered with lime. The school has a total area of around 6,420.06 square meters. The project site is located in the Shillong municipal area and is around 10 kilometers away from the nearest protected area (Lady Hydra Park). Review of secondary literature and site visits confirmed the absence of any unique or ecologically significant flora and fauna. No land acquisition will be required for any new construction activity as the school has adequate open area in the front and back. The project activity will not lead to any involuntary resettlement.

5. Upgrading of the school to Rashtriya Madhyamik Shiksha Abhiya standards will provide an improved, safe, and hygienic learning environment for the students of Laitumkhrah Assamese Secondary School. Classrooms would be refurbished to make them more ventilated and lighted. Improved furniture and teaching aids (e.g., display boards, computers, and projectors) will be provided. While refurbishing the primary school section, the concept of Building as Learning Aid (BALA) will be followed. Water harvesting and water purification facilities will be provided. All the toilets will be upgraded and separate toilets will be provided for girls/women. The drainage pipes and channels will be repaired and redesigned so that overall sanitation improves. Facilities will be provided to improve solid waste management. Since the existing buildings are of a heritage type (i.e., they have an Assam type construction where there is a timber frame with bamboo intermediate in the panels plastered with lime), traditional restoration techniques will be used while upgrading them. Meghalaya is in seismic zone V which is the highest in terms of probable seismic activity. The Laitumkhrah Assamese Secondary School will be retrofitted and strengthened in line with the required government’s seismic safety standard for zone V. The building structure will also become resilient to environmental extremes including heavy rain and landslides which are common in Meghalaya.
6. The IEE report comprises baseline data on the existing condition of the physical and biological environment, the anticipated environmental impacts, and proposed mitigation measures. Field surveys were undertaken to assess the physical and biological environment. Data has been collected from secondary sources to supplement the findings of the field survey. All the issues such as the ecology, management of construction, shelter and sanitation, use of equipments and machineries, environmental health and safety, occupational hazard, social and environment management and monitoring plan have been dealt with in detail in the respective sections of the report. However, these are briefly enumerated below to have a quick assessment of the situation.

<table>
<thead>
<tr>
<th>Environmental Parameter</th>
<th>Level of Impact</th>
<th>Reason</th>
<th>Proposed Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Impact</td>
<td>Low</td>
<td>Insignificant air emission during the construction phase as most of the construction activity would be manual and carried out on a minor scale.</td>
<td>(i) Sprinkling of water (ii) Proper handling of excavated soil</td>
</tr>
<tr>
<td>Water</td>
<td>Low</td>
<td>(i) The project will require small quantity of water for construction. (ii) No hazardous effluent is envisaged to be discharged during construction</td>
<td>(i) The required water will be sourced from the nearby branch of the Meghalaya fire brigade department (ii) Domestic effluent shall be discharged in soak pits.</td>
</tr>
<tr>
<td>Land</td>
<td>Low</td>
<td>The school falls in the Shillong Municipal area. No additional land would be required for the project as the school already has open/vacant areas within the school premises.</td>
<td>It will be ensured that the workers maintain cleanliness at the project site.</td>
</tr>
<tr>
<td>Noise</td>
<td>Low</td>
<td>The construction activity may lead to noise pollution for the students. However, it would be minimal and much below the permissible limits.</td>
<td>The bulk of the construction will take place during the summer and winter vacation to minimize disruption. Noise monitoring will be done at regular intervals. Also, there are no sensitive/protected locations in the vicinity of the project site.</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Low</td>
<td>As no ecologically sensitive place (protected area/reserved forest/Important flora and fauna species) lies within 2 km radius from the project site</td>
<td>Plantation activities will be carried out to compensate for any tress that may have to be cut.</td>
</tr>
</tbody>
</table>

7. The IEE study of the proposed project indicates that the benefits from the implementation of the proposed project are significant and long term in nature. The study also establishes that the adverse impacts, if any, can be easily mitigated or avoided. The proposed physical infrastructure development of the school project falls under ‘Category B’ as per ADB’s environmental categorization due to limited adverse environmental impacts. Moreover, these are site-specific, easily reversible, and can be readily addressed through mitigation measures.
I. INTRODUCTION

A. Background

1. The Laitumkhrah Assamese Secondary School is located in Shillong, Meghalaya. The school was established on 1939 and has a Assam type construction (timber frame with bamboo intermediate in the panels plastered with lime). The school has a total area of around 6,420.06 square meters and currently runs classes from grade VI to X. There is a separate school building (Laitumkhrah Assamese Primary School) in the same premises. The total number of students in the secondary school is 220. Of these, 102 are girls. The school is located in a hilly area and is adjacent to the Government Horticulture/Fisheries/Agriculture Departments. The other office buildings adjacent to the school building include Let-Wireless department, Assam Auto Agency (Petrol pump), etc. The school has provided three staff quarters within the premises (Table 1).

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Particulars</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>School Site</td>
<td>Laitumkhrah Assamese Secondary School</td>
</tr>
<tr>
<td>2</td>
<td>Village Name</td>
<td>Laitumkhrah</td>
</tr>
<tr>
<td>3</td>
<td>District Name</td>
<td>East Khasi</td>
</tr>
<tr>
<td>4</td>
<td>Block</td>
<td>Shillong Municipal and Cantt.</td>
</tr>
<tr>
<td>5</td>
<td>State</td>
<td>Meghalaya</td>
</tr>
<tr>
<td>6</td>
<td>Road Accessibility</td>
<td>Yes (Connected with the PWD road in Shillong)</td>
</tr>
<tr>
<td>7</td>
<td>Built-up area of the school</td>
<td>Around 3,000 square meters</td>
</tr>
<tr>
<td>8</td>
<td>Source of water</td>
<td>The school has no reliable running source of water. Rainwater collected through rooftop rainwater harvesting structure is sufficient only for three months during the rainy season. For the remaining months, the school buys drinking water from private sources which are expensive. Some water is also sourced from the Fire Brigade Department.</td>
</tr>
<tr>
<td>9</td>
<td>Toilet Facility</td>
<td>Toilet: Boys-1 Girls-1 Urinals: Boys- 3</td>
</tr>
<tr>
<td>10</td>
<td>Laboratory Facility</td>
<td>Room designated but very little usable equipment</td>
</tr>
<tr>
<td>11</td>
<td>Library</td>
<td>Available but very few books available</td>
</tr>
<tr>
<td>12</td>
<td>First-Aid Kit</td>
<td>Not Available</td>
</tr>
<tr>
<td>13</td>
<td>Fire Safety Equipments</td>
<td>Not Available</td>
</tr>
<tr>
<td>14</td>
<td>Playground</td>
<td>Yes. A football ground is available for the students</td>
</tr>
<tr>
<td>15</td>
<td>Storm Water Drainage Facility</td>
<td>No</td>
</tr>
<tr>
<td>16</td>
<td>Trees inside the school premises</td>
<td>Yes, a number of trees are there behind the school building</td>
</tr>
<tr>
<td>17</td>
<td>Emergency Preparedness Plan in</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>case of natural disasters</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Waste Storage Facility</td>
<td>None</td>
</tr>
</tbody>
</table>

PWD = Public Works Department.

2. The Laitumkhrah Assamese Secondary School is one of the secondary schools which has been selected for upgrading under the Asian Development Bank (ADB) funded “Supporting Human Capital Development in Meghalaya.” An initial environment examination (IEE) has therefore been undertaken to ensure that the environmental rules and regulations prescribed by the Government of India, Government of Meghalaya, and ADB are adhered to while undertaking the civil works to upgrade the school.
B. Purpose/Objectives of IEE

3. The purpose of conducting an IEE is to provide information about the general environmental setting of the project area, identify impact of the project activities (physical infrastructure development of the schools) on the bio-physical, socio-economic, and cultural environment of the project, recommend site specific environmental mitigation measures, and prepare an environmental management plan for the project area to ensure that the IEE addresses the requirements of the following:

   i. ADB’s Safeguard Policy Statement, July 2009
   ii. Relevant host country laws, regulations, applicable treaties and agreements

4. The assessment of the project has been carried out for both positive and negative impacts. It is expected that the project activities will not have any significant adverse impact on the environment.

C. Methodology and Approach of IEE

5. The following activities were undertaken for the purpose of conducting IEE:

   - Desk review of information such as maps, reports, etc. for the project.
   - Preparation of checklist for collecting project related information.
   - Review of national and local laws/regulations and procedures relating to environment, health and safety, resettlement and rehabilitation, etc.
   - Field visits to collect data relevant to the study area.
   - Interviews on a sample basis with the following stakeholders: teachers, students, school management committee (SMC) members, and representatives of the local community.

II. LEGAL POLICIES AND INSTITUTIONAL FRAMEWORK

6. The Ministry of Environment and Forest, Government of India, has the overall responsibility to set policy and standards for the protection of environment along with the Central Pollution Control Board. This includes air, noise, and water quality standards, and the requirements for preparing environmental impact assessment statements for development projects (if applicable). These standards are of significance for the proposed project. Salient features of relevant environmental laws and regulations, including their applicability to this project is provided in Annex 1.

7. The implementation of the project will be governed by the national laws and state specific 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, and maintenance. This report has also considered ADB’s Safeguards Policy Statement (SPS) 2009 requirements. Provided the project complies with the national and ADB SPS 2009 requirements, no significant adverse environmental implications are envisaged from the implementation of the project activities.
III. PROJECT DESCRIPTION

A. Project Overview

8. Upgrading of the Laitumkrah Assamese Secondary School to Rashtriya Madhyamik Shiksha Abhiya standards will provide an improved, safe, and hygienic learning environment for the students. Classrooms would be refurbished to make them more ventilated and lighted. Improved furniture and teaching aids (e.g., display boards, computers, and projectors) will be provided. While refurbishing the primary school section, the concept of Building as Learning Aid (BALA) will be followed. Water harvesting and water purification facilities will be provided. All the toilets will be upgraded and separate toilets will be provided for girls/women. The drainage pipes and channels will be repaired and redesigned so that overall sanitation improves. Facilities will be provided to improve solid waste management. Since there is space at the back of the school, additional rooms including a library and laboratory will be constructed to accommodate students of grades XI and XII. Through appropriate landscaping, access for physically impaired children will be made easier. The play-ground will also be improved. Since the existing buildings are of a heritage type (i.e., they have an Assam type construction where there is a timber frame with bamboo intermediate in the panels plastered with lime), traditional restoration techniques will be used while upgrading them.

9. Meghalaya is in seismic zone V which is the highest in terms of probable seismic activity. The Laitumkhrah Assamese Secondary School will be retrofitted and strengthened in line with the required government’s seismic safety standard for zone V. The building structure will also become resilient to environmental extremes including heavy rain and landslides which are common in Meghalaya.

B. Project Location

10. The Laitumkrah Assamese Secondary School lies approximately between 25°07” & 25°41” north latitude and 91°21” & 92°09” east longitude. The northern portion of the East Khasi Hills district is bounded by the plain of Ri-Bhoi District gradually rising to the rolling grasslands of the Shillong plateau, interspersed with river valleys, then falls sharply in the Southern portion forming deep gorges and ravines in Mawsynram and Shella-Bholaganj, community and rural development block, bordering Bangladesh. The district is bounded by the Jaintia Hills District to the east and the West Khasi Hills District to the west.

C. Connectivity

11. The selected project location has well established connectivity and accessibility through road and air:

   Air: Nearest airport from the location is Umroi Airport which is located around 30 kilometers from Shillong.

   Road: The project is easily approachable from the main state highway.
IV. ENVIRONMENTAL AND SOCIAL BASELINE STATUS

A. Physical resources

1. Topography

12. The East Khasi Hills District is mostly hilly with deep gorges and ravines on the southern portion. The most important physiographic features of the district is the Shillong Plateau interspersed with river valley, then falls sharply in the southern portion forming deep gorges and ravine in Mawsynram and Shella-Bholaganj bordering Bangladesh. The district represents a remnant of ancient plateau of Indian Peninsular Shield which is deeply dissected suggesting several geotectonic and structural deformities that the plateau has undergone. In the southern border areas, there are fringes of alluvial plains that are localized in nature. The school site is located on a hilly terrain with stabilized slope.

2. Soil Type

13. Soil type of an area is dependent on factors like geology, relief, climate and vegetation. Red loamy soil is a product of weathering of rocks like granites, gneisses, etc. which are relatively rich in clay forming minerals. This soil type is rich in organic matter, nitrogen and acidic in nature. They are found exposed in the central part of the district. Laterite soil is a weathering product of rocks like quartzite, schist, conglomerate, etc. which is found exposed in the northern area of East Khasi Hills. These soils are rich in iron and aluminum. Alluvial soils are found exposed in the southern part of the district which are rich in potash but poor in phosphate content. They are acidic in nature.

3. Climate

14. The climate of the district ranges from temperate in the plateau region to the warmer tropical and sub-tropical pockets on the northern and southern regions. The whole of the district is influenced by the south-west monsoon which begins generally from May and continues until September. The weather is humid for the major portion of the year except for the relatively dry spell usually between December and March.

4. Rainfall

15. The district has the unique distinction of having the wettest place on earth (i.e., Mawsynram with an average annual rainfall of about 12,270 mm). This is followed by the second wettest place called Cherrapunjee with an average annual rainfall of 11,600 mm. Southwest monsoon originating from the Bay of Bengal and the Arabian Sea directly influences this high rainfall.

5. Water Resources

16. The district of East Khasi Hills is covered mainly by crystalline rocks with tertiary sedimentary rocks. The secondary porosity in consolidated formation (e.g., fractures, joints, etc.) developed due to major and minor tectonic movements and prolonged physicochemical weathering form the conduits as well as reservoirs of ground water. The weathered mantle varies from 10 to 30 m bgl. Ground water occurs under water table condition in the top weathered quartzite and in semi-confined condition in the fractured and jointed rocks.
17. In the shallow aquifer, the depth to water level ranges from less than 2 m bgl to 6 m bgl. In the deeper aquifer, the depth to water level ranges generally beyond 2 m bgl with yield ranging from 5 to 10 m³/hr. The bore wells tapping the deeper aquifer are encountered with two sets of fractures within a depth range of 120 m. Other set of fracture may extend deep beyond 120 m bgl. Ground water development in the district is mainly through dug/open well tapping the water in the weathered zone and bore wells are constructed to tap ground water from the fractures/joints in the hard rocks.

18. Springs play a major role in catering the water requirement of the people throughout the year. Most of the springs are gravity springs. It is observed that discharge of most of the springs lie within the range of 5,000–25,000 lpd in pre- & post monsoon period. It has also been observed that the high yielding springs are closely related to rainfall. So the development of springs having a discharge of more than 5,000 lpd will help in mitigating the water requirement of the people in the area to a great extent. The important rivers in the northern part of the district are Umtrew, Umiam and Umkhen and in the southern part, rivers like Myntang and Umgnot are draining the district.

6. Earthquake Zone

19. The school site falls in Seismic Zone 5, one of the most active earthquake zones on earth. According to Global Seismic Hazard Assessment Program data, the state of Meghalaya falls in a region of high to very high seismic hazard.

7. Air Quality and Noise

20. The Ambient Air Quality measurements in the vicinity shall remain within the limits of the revised National Ambient Air Quality Standards. Overall, the impact of generated noise on the environment during repair/renovation/construction period is insignificant, reversible and localized in nature.

B. Ecological Resources

1. Vegetation

21. The forests of Meghalaya can broadly be grouped under the tropical type and the temperate type, mainly based on the altitude, rainfall and dominant species composition. The temperate forests occupy the higher elevations of about 1,000 meters, mostly along the southern slope of Khasi and Jaintia Hills. About 8,514 square kilometers area is under recorded forest area (reserved and protected forests), which is about 38 % of the total geographical area of the state. The reserved forest areas and protected forests in and around Shillong is being managed by the department in arrangement with the district councils. The forests of Meghalaya are a treasure house of valuable products such as timber, fuelwood, fodder, resin, tannin, gums, shellac, fibre, latex, essential oils, fats, edible fruits, honey and a large number of medicinal plants. Meghalaya is well known for bay leaves and cinnamon. Morus alba, quercus semiserrata, and a number of other tree species play a vital role in the economy of the state, being the host plants for rearing of silk worms for sericulture.

2. Wildlife and Protected Area Network

22. The state’s protected area network comprises one wildlife sanctuary and two national parks. Recognizing the importance of this region as one of the hot spots, majority of the
biodiversity-rich areas of the state have been placed inside the protected area network system comprising mainly of the National Park and Sanctuary. The details on the forest area, forest cover and area under protected areas are presented in Table 2 below.

<table>
<thead>
<tr>
<th>Table 2: Forest Details under Protected Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> National Parks</td>
</tr>
<tr>
<td>Balphakram National Park</td>
</tr>
<tr>
<td>Area in hectares</td>
</tr>
<tr>
<td>Nokrek National Park</td>
</tr>
<tr>
<td><strong>C</strong> Reserved Forest</td>
</tr>
<tr>
<td><strong>D</strong> Protected Forest</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

23. However, the project school is not located in or near a legally protected area. Review of the secondary literature and site visits confirmed the absence of unique or ecologically significant flora and fauna. As per the school management, the nearest park (Lady Hydari Park) is around 10 kilometers from the school premises.

V. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

24. Based on the condition assessment of the existing structure of the school building, the school building may require repair, restoration and retrofitting of structural and conditional distresses in the existing built forms and overall improvement of environmental management of the school building in terms of appropriate drainage, handling and disposal of sanitary and solid waste, introducing water harvesting, and making the building seismically strong. Construction of new rooms may also be required to improve the existing infrastructure of the school which in turn would help in enhancing the quality of education.

25. The project will also contribute positively to the local environment by developing healthy and safer school environment with natural light and well ventilated classrooms, structures resilient to environmental extremes (including climate variability such as severe storms and geophysical hazards such as earthquakes and landslides), improve hygiene among children, and provide clean drinking water. Capacity building of stakeholders in environmental safeguards, including improved methods of construction, retrofitting of old structures, and preparation of resilient infrastructure will enhance knowledge and awareness for sustainable school infrastructure development in the future. However, the construction activities may cause some adverse environmental impacts, though very limited in scale, which may include dust and noise pollution, disruption of natural ecosystem, occupational health hazards, risk from existing poor sanitation system, land and water contamination, and soil erosion. Due to the vulnerable geographic location, there may be some risks which may include natural disasters (earthquakes) and extreme climate events. These impacts are not anticipated to be project induced but rather, they are related to the geographical location of project site.

26. The following table (Table 3) summarizes the impacts that are expected to arise from the project activities:

<table>
<thead>
<tr>
<th>Table 3: Potential Project Generated Environmental and Social Impacts with Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage</strong></td>
</tr>
<tr>
<td>Project Aspect</td>
</tr>
<tr>
<td>Approvals,</td>
</tr>
<tr>
<td>Project Aspect</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| Licences and Permits        |                                                       | licences required by the state and local legislation will be obtained prior to construction commencing.  
- All approvals, permits and licences shall be maintained and complied with during the construction period. Should there be any changes to the project which would require additional permits or licences, these shall be obtained. |
| Access, utility relocation   | Disruption to local amenities                         | - Access to properties (private properties, schools, etc.) affected by the project shall be maintained throughout the construction period. Should there be a need to close any access temporarily, then owners of the affected property shall be given notification of the extent, timing and duration at least 24 hours prior to its closure. Any legal access way affected by the works shall be reinstated to an equivalent standard.  
- Access to public roads and properties shall be maintained throughout the full duration of the construction works |
| Loss of land                | No additional land will be required, as all school upgradation activities including construction work related to expansion activities will be done within the school premises | - Resettlement and/or land acquisition problems are not anticipated in the school upgradation/construction activities |
| Clearing of trees/Removal of vegetation | Loss of trees and vegetation  
- Soil erosion and surface run-off | - All trees and vegetation to be removed shall be marked prior to clearance, and strict control on clearing activities will be implemented to ensure minimal clearance.  
- All reasonable measures shall be undertaken to ensure that no native fauna is harmed or placed at risk during the course of the clearing activities  
- Felled trees to be replaced by compensatory plantation at minimum 1:1 ratio |
| Drainage management         | Drainage congestion  
- Water logging  
- Vector proliferation | - Design adequate drainage passage following natural path  
- Natural drainage lines shall be identified and appropriate sediment controls will be designed and implemented prior to construction commencing.  
- Ancillary structures and work compounds shall be located at least 20 meters away from any built or natural drainage lines.  
- Fill ditches in school premises  
- Discharge drainage flow with proper downstream protection.  
- The site sediment controls shall be |
<table>
<thead>
<tr>
<th>Project Aspect</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>designed to prevent sediment from the construction zone from entering and</td>
<td>adverse affecting natural drainages or areas of native vegetation downstream from the construction zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope stability</td>
<td>Landslide or gully erosion on slopes that may threaten school infrastructure.</td>
<td>● Planning and designing the refurbishment/upgrading of schools keeping in mind the fragile natural environment and site specific geological conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Avoid or maintain adequate distance from erosion prone areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Adopt right angle of cut on slopes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Stabilize slopes by engineering and bio-engineering measures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Measures taken to avoid undercutting of hill toes that may cause slides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Do not exert excess load on slopes by disposing spoil</td>
</tr>
<tr>
<td>Erosion and sediment</td>
<td>Loss of soil, water pollution</td>
<td>● Temporary erosion and sediment controls shall be installed prior to the commencement of any works with the potential to cause soil erosion, including stockpiling of construction materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Erosion and sediment controls shall be monitored on a weekly basis and immediately following rainfall, inspection results shall be recorded as part of site quality management system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Wherever possible during the course of the works, exposed soil areas shall be progressively stabilized or protected by an appropriate method to minimize erosion potential.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Topsoil shall be stripped and stockpiled later for re-spreading on all exposed areas when final shaping has been completed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Fill material shall not be placed around or pushed up against the bases of trees and shrubs to be retained within the construction site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● All fill shall be sufficiently compacted to minimize erosion potential.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● All exposed soil areas shall be stabilized and revegetated as soon as possible on completion of works to prevent potential erosion.</td>
</tr>
<tr>
<td>Spoil disposal</td>
<td>● Drainage blockage causing localized ponding and/or muddy runoff</td>
<td>● Minimize spoil disposal by balancing cut and fill wherever possible</td>
</tr>
<tr>
<td></td>
<td>● Spoil tipped over slope may cause slide</td>
<td>● Manage spoil to reclaim land with proper landscaping and vegetation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Aspect</td>
<td>Potential Impact</td>
<td>Mitigation Measures</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Water pollution                        | Water pollution from construction activities          | • Do not dispose spoil on drainage path  
• Prohibit direct disposal of solid and liquid waste into nearby water bodies  
• Spoil management plan to be developed and implemented by the contractor  
• Awareness session on handling and storage of materials and waste management to be conducted for the construction workers |
| Transportation and storage of construction materials | • Nuisance to the general public  
• Fugitive emissions | • The vehicles carrying the materials should be covered and secured to prevent loss or re-suspension of materials during travel  
• Construction materials should be stored in covered areas to ensure protection of surrounding areas from dust and emissions  
• Any transportation of materials on local roads shall be done during day light hours.  
• All vehicle movements or other construction activities shall be restricted to the delineated construction zone, the existing road network or previously disturbed areas. Construction vehicles, personnel and machinery shall not enter fenced off areas or areas beyond the delineated construction zone |
| Stone crushing                         | Dust and noise pollution                              | • Locate crusher plant, if any, away from settlement, school, and forest areas.  
• Enclose and use water sprinkler to arrest dust.  
• Buy required material from authorized operating plants |
| Air and noise pollution                 | • Dust nuisance to children from construction works  
• Dust and noise generated by vehicles passing by schools  
• Loud noise during construction | • Wherever feasible, dust generating type of work shall be done during off-school time  
• Construction work shall be limited to day light hours  
• Laborers’ use of masks and safety gears  
• Water sprinkled on work areas  
• Cover material during transportation  
• Newly exposed surface areas shall be mulched and replanted as soon as possible in order to reduce the potential for erosion and suppress dust |
| Employment opportunity                 | Local people employed in project activities           | Contractors encouraged to use local labor, wherever possible |
| Waste management and minimization      | Impacts on land, water and visual impacts showing poor housekeeping practices | • Recycled materials shall be used to the limits of design  
• Any waste generated by the construction site shall be contained within the boundary of the site and removed at regular intervals to an appropriate waste |
<table>
<thead>
<tr>
<th>Project Aspect</th>
<th>Potential Impact</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational health and safety</td>
<td>Lack of minimum required facilities of space, ventilation, sanitation, light and safe drinking water in labor camps.</td>
<td>- Disposal or recycling facility licensed to handle each waste type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The worksite shall be left in a tidy and rubbish free state upon completion of the works</td>
</tr>
<tr>
<td></td>
<td>• Lack of safety tools</td>
<td>- Provide adequate space with ventilation, clean toilets, solid waste management, light and safe drinking water in camps</td>
</tr>
<tr>
<td></td>
<td>• Lack of safe construction practices</td>
<td>- Provide mosquito nets at labor camps</td>
</tr>
<tr>
<td></td>
<td>• Vector disease</td>
<td>- Keep camp and work area clean and without water logging</td>
</tr>
<tr>
<td></td>
<td>• Use of wood as construction materials</td>
<td>- Highest priority to safe construction practices</td>
</tr>
<tr>
<td></td>
<td>Deforestation</td>
<td>- Provide safety gears to workers working in hazardous areas and provide training in the use of these safety gears</td>
</tr>
<tr>
<td></td>
<td>• Health and safety risks</td>
<td>- Keep first aid box ready at work areas and camps</td>
</tr>
<tr>
<td></td>
<td>• Chances of spread of sexually transmittable diseases like AIDS</td>
<td>- Minimize use of wood for construction</td>
</tr>
<tr>
<td></td>
<td>• Water pollution</td>
<td>- Use local materials as much as possible</td>
</tr>
<tr>
<td>Influx of migrant workers</td>
<td></td>
<td>- Innovations shall be integrated in the design to make schools more student and environment-friendly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Contractor shall supply kerosene or LPG at camps and restrict cooking and heating using firewood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Local labor to be given preference for job opportunities and each contractor should be bound by this commitment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ensure labor-related regulations are met</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- In case of outside labor, ensure that their working conditions as well as camps meet local regulations and best practice</td>
</tr>
</tbody>
</table>

**Operational Stage**

The school is in operation for the past 70 years and the project activity would be limited only to repair, restoration and retrofitting of structural and conditional distresses in the existing built forms. Hence, the project activity during the operation stage would only be limited to monitoring activities.

<table>
<thead>
<tr>
<th>Maintenance of the school infrastructure facilities</th>
<th>Damage to school property due to inadequate maintenance</th>
<th>Maintenance activities to be carried out by SMC as and when required. Maintenance registers to be maintained.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and hygiene</td>
<td>• Un-hygienic drinking water leading to health issues</td>
<td>• Drinking water quality to be tested at least once a year</td>
</tr>
<tr>
<td></td>
<td>• Lack of sufficient quantity of water for drinking and sanitation</td>
<td>• The students to be made aware on the importance of conservation of water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The sanitary facilities to be cleaned on a regular basis</td>
</tr>
</tbody>
</table>

LPG = liquefied petroleum gas, SMC = school management committee.
VI. ENVIRONMENT MONITORING AND REPORTING PLAN

27. The environmental monitoring plan forms the basis for verifying the extent of compliance during the implementation stages of the project. The objectives of an environmental monitoring program are:

i. to evaluate the performance of mitigation measures proposed in IEE;
ii. to provide information which could be used to verify predicted impacts and thus validate impact prediction techniques;
iii. to suggest improvement in environmental mitigation measures if required;
iv. to provide information on unanticipated adverse impacts or sudden change in impact trends;

28. Implementation of mitigation measures will be ensured through both routine and periodic monitoring. Monitoring activities for project at different phases of implementation will be as follows (Tables 4 and 5):

1. Sample of Construction Phase Monitoring

<table>
<thead>
<tr>
<th>S.N</th>
<th>Indicators of Monitoring</th>
<th>Types of Monitoring/Method of Monitoring</th>
<th>Monitoring Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drinking Water Quality</td>
<td>Sampling, lab testing &amp; comparison with generic standard</td>
<td>Annual</td>
<td>SMC</td>
</tr>
<tr>
<td>2</td>
<td>Transportation of construction material in covered condition, and safe loading &amp; unloading of construction materials.</td>
<td>Direct observation</td>
<td>Regular during construction</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>3</td>
<td>Stockpiling of excavated materials</td>
<td>Direct observation</td>
<td>Everyday</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>4</td>
<td>Reuse of excavated materials</td>
<td>Direct observation</td>
<td>Everyday</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>5</td>
<td>Solid waste segregation disposal</td>
<td>Direct observation</td>
<td>Everyday</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>6</td>
<td>Clearing of trees</td>
<td>Direct observation</td>
<td>Regular during construction</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>7</td>
<td>Occupational health and safety, use of safety gears</td>
<td>Direct observation</td>
<td>Once a month</td>
<td>SMC/Contractor</td>
</tr>
<tr>
<td>8</td>
<td>Safety to students</td>
<td>Record of injury</td>
<td>Once a week</td>
<td>SMC</td>
</tr>
<tr>
<td>9</td>
<td>Water logging and vector proliferation</td>
<td>Direct observation</td>
<td>Once a week</td>
<td>SMC/Contractor</td>
</tr>
</tbody>
</table>

SMC = school management committee.

2. Sample of Operation Phase Monitoring

<table>
<thead>
<tr>
<th>S.N</th>
<th>Indicators of Monitoring</th>
<th>Types of Monitoring/Method of Monitoring</th>
<th>Monitoring Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation of monitoring reports</td>
<td>Preparation of monitoring reports</td>
<td>Monthly</td>
<td>SMC/PMC</td>
</tr>
<tr>
<td>2</td>
<td>Drinking water quality</td>
<td>Samples taken from different points, source, delivery points Laboratory testing</td>
<td>Annual</td>
<td>SMC/PMC</td>
</tr>
<tr>
<td>3</td>
<td>Solid waste management</td>
<td>Records of waste</td>
<td>Bi-annual</td>
<td>SMC/PMC</td>
</tr>
</tbody>
</table>
### S.N | Indicators of Monitoring | Types of Monitoring/Method of Monitoring | Monitoring Frequency | Responsibility
---|---|---|---|---
4 | Number of orientation and training system | collected and managed Number of orientation and trainings conducted | Regular | SMC/PMC
5 | Impact Audit | Compliance with EMF | Annual | PMC

**EMF** = environmental monitoring framework, **PMC** = project management consultant, **SMC** = school management committee.

29. The Department of Education (DOE) will carry out annual review to assess how effectively the environmental safeguard requirements have been followed.

### VII. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESSAL MECHANISM

#### A. Consultation and Information Disclosure

30. Consultation and information disclosure will be a continuous process during the preparation of the environmental assessment document and implementation of the environmental monitoring plan. The environment assessment will ensure to conduct meaningful consultation with affected people and concerned stakeholders, including civil society and facilitate their informed participation. The meaningful consultation shall begin early in the project component preparation stage and carried out in an ongoing basis throughout the project cycle, timely disclosure of IEE reports in understandable format and language by the local stakeholders. Consultation is organized in congenial environment without intimidation, and is gender sensitive.

#### B. Grievance Redressal Mechanism

31. The main objective of the Grievance Redressal Mechanism is to provide a time bound and transparent mechanism to voice and resolve complaints of the people in the project area. The environment consultants engaged through the PMC and design and supervision consultant will be responsible for handling grievances. They will (i) record the complaints, categorize and prioritize them; (ii) consult with all relevant stakeholders (including contractors), visit the project site, and do the required examination; (iii) settle the grievances in consultation with the complainant and the project staff; (iv) report to the aggrieved parties about the decision/solution; and (v) forward the unresolved cases to higher authorities for resolution. In case of complex complaints, the environmental consultants will inform the project director and guide him about practical options for resolving the grievances.

32. Grievances will be redressed within two to four weeks from the date of lodging the complaints. If resolution attempts at the SMC level fail, the SMC will refer the complaints to the district project coordination unit (DPCU) along with the minutes of the hearings. If a decision made at this level is found unacceptable by the aggrieved person(s), DPCU can refer the case to DOE with the minutes of the hearings at both school and district levels. The SMC/DPCU will keep records of all resolved and unresolved complaints and grievances and make them available for review as and when asked for by DOE and ADB Resident Mission in Delhi. Information about GRC will be made public through nongovernment organizations.
VIII. CONCLUSION AND RECOMMENDATIONS

33. This report assessed various existing environmental parameters in and around the project and the actions planned to minimize any significant negative impact. The project site is not located in a sensitive ecosystem, and is not significant from the historical and cultural perspective. The project will not cause any significant adverse environmental and social impacts during construction, repair or renovation phase of the project. Rather, the project activity will have a positive impact as indicated earlier.

34. The limited project associated impacts are associated with drainage congestion/waterlogging, dust and noise pollution, occupational health hazards, risk from poor sanitation system, improper lighting and ventilation system in school, and management of labor at the site. Moreover, most of the associated impacts are expected to be limited to the construction phase, and will therefore be temporary in nature. Adequate mitigation actions will be undertaken in line with management and monitoring of the set of recommended mitigation measures. Regular monitoring of the recommended mitigation measures shall also be carried out during the implementation phase of the project.

35. Based on the Ministry of Environment and Forest’s Guidelines of the GOI, the proposed project does not require an environmental clearance. Considering the above, the project meets the classification criteria for category B in accordance with ADB’s SPS 2009.
## SALIENT FEATURES OF RELEVANT ENVIRONMENTAL LAWS AND REGULATIONS

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Agency</th>
<th>Statue/Policy</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| 1      | Ministry of Environment and Forests | Environment (Protection) Act 1986  
Forest (Conservation) Act, 1927  
Forest (Conservation) Act, 1980 (as amended in 1998)  
Forest (Conservation) Rules, 1981  
Municipal Solid Wastes (Management and Handling) Rules, 2000 | To protect and improve the quality of the environment and to prevent, control and abate environmental pollution. To restrict deforestation by restricting clearing of forested areas. To ensure proper collection, reception, treatment, storage and disposal of municipal solid wastes generated at the site. |
| 2      | State Pollution Control Board | Water (Prevention and Control of Pollution) Act 1974 as amended in 1988  
Air (Prevention and Control of Pollution) Act 1981 as amended in 1987  
The Hazardous Wastes (Management and Handling) Rules, 1989 and Amendment Acts of 2000 and 2003 | To provide for the prevention and control of water pollution, and maintaining or restoring wholesomeness of water. To provide for the prevention, control and abatement of air pollution and for the establishment of Boards to carry out these purposes. To ensure for safe collection, storage and disposal of hazardous wastes. |
| 3      | Environment and Forest Department | Wildlife (Protection Act), 1972 | To protect wild animals and birds through the creation of National Parks and Sanctuaries. |
| 4      | Archaeological Survey of India, Directorate of Archaeology | Ancient Monuments and Archaeological sites and Remains Act, 1958 | To protect and conserve cultural and historical remains To regulate construction activities near the monuments and sites protected by the Government |

1. Other applicable labor laws include:
   
i. Minimum Wages Act 1948
   ii. Child Labour (Prohibition and Regulation) Act, 1986
   iii. Workmen’s Compensation Act, 1923
   iv. Contract Labour (Regulation and Abolition) Act, 1970
PHOTOS OF SITE

Figure A2.1: Photo of the school building

Figure A2.2: Staff quarters within the school premises

Figure A2.3: Back side of the school with existing trees within the premises

Figure A2.4: Board of the horticulture department located adjacent to the school boundary
Figure A2.5: Toilet facility provided to students

Figure A2.6: Rooftop rain water harvesting structure made by the school