



Initial Environmental Examination

Project Number: 46166-001
December 2017

IND: Supporting Human Capital Development in Meghalaya

Subproject : Babelapara Higher Secondary School, Babelapara, Dalu, West Garo Hills, Meghalaya

Submitted by:

Finance Department, Government of Meghalaya

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**GOVERNMENT OF MEGHALAYA
FINANCE DEPARTMENT**

No.FEA(ADB)/PMU/ESG/1/2015/1137,

Dated: Shillong, 20th November 2017

From: Shri P. K. Agrahari, IFS
Secretary to the Govt. of Meghalaya
Finance Department & Deputy Project Director,
Supporting Human Capital Development in Meghalaya (SHCDM)

To: Mr. Kenichi Yokoyama,
Country Director, Asian Development Bank (ADB)
India Resident Mission (INRM),
4 San Martin Marg, Chanakyapuri,
New Delhi 110 021, India



Subject: Loan No. 3033-IND for ADB assisted project "Supporting Human Capital Development in Meghalaya" – Submission of revised and updated Initial Examination Environment (IEE) reg.

Dear Mr. Yokoyama

In inviting a reference to the subject cited above, we wish to submit herewith the revised Initial Environment Examinations (IEEs) duly signed after incorporating ADB comments and views. The summary are as follow:-

SN.	Name of the Schools	Remarks
1	IEE_Ambrose Memorial Secondary School	Revised and updated IEE after incorporating ADB advices on Environmental Monitoring for Air Quality Monitoring by including PM2.5 in addition to PM10 and do away with the SO2 and NOX
2	IEE_looksi Presbyterian Secondary School	
3	IEE_Khadar Nor Proceeding Secondary School	
4	IEE_Laitumkhrah Bengali Secondary School	
5	IEE_Myngken Christian Higher Secondary School	
6	IEE_Nongtluh Higher Secondary School	
7	IEE_Raid Lyngkholi Secondary School	
8	IEE_Boldamgre Deficit Secondary School	
9	IEE_Garobadha Higher Secondary School	
10	IEE_Gonchudare Higher Secondary School	
11	IEE_Hawakhana Higher Secondary School	
12	IEE_Monabari Secondary School	
13	IEE_Mount Sinai Secondary School	
14	IEE_Najing Memorial GA Secondary School (Danakgre Secondary School)	
15	IEE_Nogorpara Deficit Secondary School	
16	IEE_Rangsakona Secondary School	
17	IEE_Rohonpara Deficit Secondary School	
18	IEE_Selsella Higher Secondary School	
19	IEE_Sibbari Secondary School	
20	IEE_Sohiong Higher Secondary School	
21	IEE_Tyrsad Higher Secondary School	
22	IEE_Vidyakamoni Secondary School	
23	IEE_Wadanang Secondary School	
24	IEE_Zekabari Higher Secondary School	
25	IEE_Gimegre Secondary School	
26	IEE_Janapriya Higher Secondary School	
27	IEE_Kynshi Higher Secondary School	
28	IEE_Mellim Deficit Secondary School	
29	IEE_Pomlum Higher Secondary School	
30	IEE_Synod Higher Secondary School	

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SN.	Name of the Schools	Remarks
31	IEE_Babelapara Higher Secondary School	Revised and updated IEE after incorporating ADB advices on Environmental Monitoring for Air Quality Monitoring by including PM2.5 in addition to PM10 and do away with the SO2 and NOX
32	IEE_MDC Multipurpose Secondary School	
33	IEE_Rongrikimgre G A Secondary School	
34	IEE_Rongsakgre Secondary School	
35	IEE_Sakhit Ch. Secondary School	
36	IEE_Sanmer Secondary School	
37	IEE_Tynring Presbyterian UP & Sec School	
38	IEE_Bandalkhona Secondary School	This is submission for new IEEs. The IEEs have been updated by incorporating PM2.5 for Monitoring of Air Quality and do away with SO2 and NOX
39	IEE_Dalu Bengali Def. Secondary School	
40	IEE_Katuli Secondary School	
41	IEE_Khonjoy Secondary School	
42	IEE_Rongsangabagre Secondary School	
43	IEE_Anath Ashram Secondary School	
44	IEE_Byndihati Secondary School	
45	IEE_Nehru Memorial Secondary School	
46	IEE_Padu Secondary School	
47	IEE_Lyngngam Presbyterian Secondary School	
48	IEE_Madan Laban Nepali Secondary School	
49	IEE_Pariong Presbytery Secondary School	
50	IEE_Raksamgre Secondary School	

This is for your kind information and necessary action.

Yours faithfully,



(P. K. Agrahari)
Secretary to the Govt. of Meghalaya,
Finance Department & Deputy Project Director,
SHCDM

Initial Environmental Examination

Initial Environmental Examination (IEE)

Project Number: IND: 46166-001: Supporting Human Capital Development in
Meghalaya

August, 2017

**IND: Supporting Human Capital Development in
Meghalaya – Babelapara Higher Secondary
School, Babelapara, Dalu, West Garo Hills,
Meghalaya**

(Phase 2, Package No 4, Lot No 4)

Prepared by the Department of Finance, Government of Meghalaya

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

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ABBREVIATIONS

ADB	:	Asian Development Bank
BHSS	:	Babelapara Higher Secondary School
CFE	:	Consent for Establishment
CGWB	:	Central Groundwater Board
DLF	:	District Level Forum
DPCU	:	District Project Coordination Unit
DSC	:	Design Supervision Consultants
EARF	:	Environmental Assessment and Review Framework
EC	:	Environmental Clearances
EMP	:	Environmental Management Plan
Gol	:	Government of India
GoM	:	Government of Meghalaya
GRM	:	Grievance Redress Mechanism
ham	:	Hectare meter
IEE	:	Initial Environmental Examination
IPP	:	Indigenous Peoples Plan
MoEF	:	Ministry of Environment and Forest
MSL	:	Mean Sea Level
MSPCB	:	Meghalaya State Pollution Control Board
MSW	:	Municipal Solid Waste
mts	:	Meters
NoC	:	No Objection Certificate
NO _x	:	Oxides of Nitrogen
PIU	:	Project Implementation Unit
PLF	:	Project Implementation Unit Level Forum
PMC	:	Project Monitoring Consultant
PMU	:	Project Management Unit
PVC	:	Polyvinyl Chloride
RCC	:	Reinforced concrete
RSPM	:	Respirable Suspended Particulate Matter
SMC	:	School Management Committee
SPM	:	Suspended Particulate Matter
SPS	:	Safeguard Policy Statement
SO ₂	:	Sulfur Dioxide
Sq.m	:	Square meters
VLF	:	Village Level Forum

EXECUTIVE SUMMARY

1. Under the “Supporting Human Capital Development in Meghalaya (SHCDM)” program, the State Government of Meghalaya (GoM) has initiated to improve the quality and delivery of secondary and higher secondary education (including teacher training) and skill development programs in Meghalaya, the program has been funded by the Asian Development Bank (ADB).
2. The proposed project interventions include construction of a new G+1 RCC building and retrofitting works for the existing school buildings at Babelapara Higher Secondary School (BHSS). The retrofitting works include up gradation of the existing infrastructure (like provision of water supply, building renovation works, repair works, provision of additional lights / fans, toilet facilities etc.), The new building shall have provision for a science lab, computer room, separate toilets for boys and girls and four classrooms.
3. As per the prevailing environmental rules and regulations of Government of India (GoI), this project on school up gradation is exempted from obtaining Environmental Clearances (EC). This is because the proposed interventions/ construction activities are not classified under either category ‘A’ or ‘B’ type projects. Hence preparation of the Environmental Impact Assessment (EIA) is not mandatory. However, if the contractor requires use of machineries like setting up of hot mix plant, batching plant, stone crushers, diesel generators etc, then he should obtain/get NoC from the Meghalaya State Pollution Control Board (MSPCB), Shillong.
4. As per the safeguard policies of the ADB, this project on school up gradation is classified as category “B” project and mandates the preparation of IEE /EMP report. This project is essential in improving the education quality and thereby it can draw the attention of more students to Babelapara Higher Secondary School from the surrounding area of Babelapara village of West Garo Hills District. By implementing this project the prime objective of skill development among the students and the staffs shall be achieved.
5. The purpose of this IEE is to capture the environmental impacts that are likely to arise due to the proposed project. The IEE has been prepared based on the secondary information that is collected from the available literatures, reports, journals, on-line information, consultations etc. Necessary site visits have also been conducted for verification of the collected information.
6. With exemption to the general construction impacts arising during the repair, restoration retrofitting works of the existing school building, the proposed project is not likely to have any other environmental impacts; accordingly the EMP has been prepared for the proposed activities. The prepared EMP shall mitigate the anticipated environmental impacts; the contractor shall adopt the suggested mitigation measures and monitoring plan.
7. Based on this Initial Environmental Examination (IEE), it shall be concluded that the proposed project shall have temporary negative impacts during the project construction, which shall be reversed during the project operation. The completion of the project shall induce a positive impact on the quality of the education, infrastructure requirements, hygienic and safe environment for the students and staffs.

I. INTRODUCTION

A. Project Background

8. Meghalaya is a small, land-locked state in northeast India with population of 2.9 million. It is flanked by Bangladesh in the south and Assam on the other three sides. A predominantly tribal state¹, it has rich mineral reserves such as coal and limestone, forest cover of more than 70%, and abundant rainfall. Meghalaya's economy has lagged behind due to its remote location, hilly terrain, and poor infrastructure. The high transport cost affects the competitiveness of economic activities and discourages private investment. The industrial base is narrow with limited processing and value addition taking place within the state. The low employability of Meghalaya's youth compounds the adverse effects of these structural constraints, thereby trapping the state in a vicious cycle of poverty and underdevelopment.

9. The project "Supporting Human Capital Development in Meghalaya" aims to enhance the employability of Meghalaya's youth by

- a) Improving the quality and delivery of secondary and higher secondary school education, and
- b) Facilitating results-oriented technical and vocational skills training.

B. Sub Project Background

10. Babelapara Higher Secondary School is located in Babelapara village, West Garo Hills District, Meghalaya. The school was established in the year 1970. Geographically the school is located at 25°18'22.42" N and 90°0'1.28" E and at an altitude of 54m above Mean Sea Level (MSL). The school-campus is spread over an estimated area of about 7153.16 sqm / 1.76 Acres of land (as per the school authority). Babelapara Higher Secondary School is aided by the members of School Management Committee (SMC) of the school with the help of local community. From the year of establishment till date the school has been running as a significant educational institute serving the needs of the surrounding villages.

11. The school in its vicinity does not have any natural water source, ecological sensitive areas including protected forests or reserve forests. The school can be accessed by a 300m long BT road branching out from the Major District Road (MDR 5) connecting Mahendraganj to Barengapara. The school has a catchment area which is approximately 15 Km covering Genapara, Jarangkona, Chongnapara, Badupara, Trehapara, Billabot, Haljati, Balijora, Kochu Adok, Mebitpara, Noksi.

12. Babelapara Higher Secondary School has been chosen to upgrade under the Asian Development Bank (ADB) funds for "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. The selection criteria for Babelapara Higher Secondary School are as follows:

¹ The tribal groups listed in Constitution Scheduled Tribe (ST) Order, 1950 account for 86% of Meghalaya's population. Khasis, Garos, and Jaintias are the three largest tribal groups of the state.



Figure 1: Project Area (Babelapara Higher Secondary School) location Map

- As per the land record of the MC, the land belongs to the school and is free from any dispute regarding its ownership
- From 1990 onwards the school is operational as a deficit school
- The pass percentage for SSLC of the school in the last five years averages 44.28%
- The school as per the enrolments in 2015 has 662 students and it meets the benchmark criteria of 50 students each in secondary and higher secondary sections.
- Given the incremental demand and the good retention rate and absence of higher secondary educational facilities in the Babelapara sub-region, the school has been acting as a potential education provided after being upgraded to Higher Secondary School (HSS)
- BHSS is located in the small village area of Babelapara village of West Garo Hills District of Meghalaya. The last mile connectivity of the school is by a BT road from MDR 5
- BHSS SMC has demonstrated High Willingness in signing the MoU with DoE under the ADB Project and the commitments made therein
- BHSS campus has adequate open area on the southern side for future development.

C. Purpose of IEE:

13. The purpose of conducting an IEE is to provide information about the general environmental setting of the project area, identify impacts 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 (EMP) for the project area to ensure that the IEE addresses the requirements of the following:

- ADB's Safeguard Policy Statement, July 2009
- Relevant laws, regulations, applicable treaties and agreements adopted by Government of India and State Government of Meghalaya

14. 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.

D. Legal Frame Work:

a) ADB Policy

15. ADB requires the consideration of environmental issues in all aspects of ADB's operations and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

16. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact and are assigned to one of the following four categories:

- **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

17. **Environmental Management Plan (EMP).** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

18. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centres, etc.) and a summary translated into Hindi/ Khasi (or) Garo for the project affected people and other stakeholders shall also be disclosed. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders and the general public can provide meaningful inputs into the project design and implementation.

b) National and State Laws

19. Implementation of the proposed project will be governed by the National (MoEF, GoI) and State (SPCB, GoM) environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure proposed projects are consistent with the legal framework, whether national, state or municipal/local. Compliance is required in all stages of the project including design, construction, and operation and maintenance.

20. The realm of environmental regulations and mandatory requirements for the proposed project is shown in **Table 1**. The Environmental Impact Assessment (EIA) notification, 2006 by the Ministry of Environment and Forests (MoEF, GoI) specifies the mandatory environmental clearance requirements. Accordingly, projects and activities are broadly categorized in two

categories² - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and; natural and man-made resources.

Table 1: Environmental Regulatory Compliance

Proposed Project	Applicability of Acts/Guidelines	Compliance Criteria
Supporting Human Capital Development in Meghalaya – Babelapara Higher Secondary School, Babelapara village, West Garo Hills District	The Environment Protection Act, 1986 - under EIA notification, 2006 (and its subsequent amendments in 2009) provides for categorization of projects into category A and B, based on extent of impacts.	The proposed project is not covered in the ambit of the EIA notification as they are not covered either under Category A or Category B of the notification. As a result, the categorization, and the subsequent environmental assessment and clearance requirements, either from the State Government or the GoI is not triggered.
	ADB's Safeguard Policy Statement 2009 (Refer Annexure -2)	Categorization of project components into A, B or C and developing required level of environmental assessment for each component. This project has been " Categorized as B and accordingly this IEE has been prepared "
	The Wildlife Conservation Act, 1972, amended in 2003 and 2006, provides for protection and management of Protected Areas.	Not applicable. No wildlife protected area in the vicinity of the project site
	The Forest Conservation Act, 1980 and its subsequent amendments necessitate obtaining clearance from the MoEF for diversion of forest land for non-forest purposes.	Project site is not located near or within forest area. No tree felling is required. Hence this act does not trigger. However, under unavoidable circumstances appropriate compensation for the loss of trees (planting of two trees with a maintenance for felling of a tree) shall be worked out
	The Meghalaya Forest Regulation (Application and Amendment) Act, 1973	
	Water (Prevention and control of pollution) Act, 1974 and; Air (prevention and control of pollution) Act, 1981	The proposed project does not involve major construction activities. It deals with minor repair, restoration and retrofitting of structural and conditional distresses in the existing built forms. Hence it does not require Water and Air consents such as Consent for Establishment (CFE) and Consent for Operation (CFO) from the MSPCB. The construction materials available locally shall be utilized.
	The Ancient Monuments and Archaeological Sites and Remains	Not applicable. The project site is not close to any of the archeological /

²All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification; All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfil the General Conditions (GC) stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In addition, General Condition (GC) of the notification specifies that any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Proposed Project	Applicability of Acts/Guidelines	Compliance Criteria
	Act, 1958, and the rules, 1959 provide guidance for carrying out activities, including conservation, construction and reuse in and around the protected monuments.	protected monuments
	The Factories Act, 1948 and The Labor Act, 1951 and subsequent amendments (Refer Annexure - 3)	The proposed project shall comply to all the rules and regulations as stipulated in the factory and labour acts with respect to Health and safety of the labours
	Meghalaya Tree (Preservation) Act, 1976	The proposed project does not envisage tree cutting. Hence this act is not applicable for this project. However, under unavoidable circumstances for felling of trees, appropriate compensation as per the Meghalaya Tree Act, 1976 shall be adopted.
	Municipal Solid Wastes (Management and Handling) Rules, 2000	Disposal of construction and municipal solid waste generated during the project construction has to be carried out through the stipulated MSW & Hazardous waste rules and subsequent amendments acts.
	The Hazardous Wastes (Management and Handling) Rules, 1989 and Amendment Acts of 2000 and 2003	

21. The above table indicates that the proposed project need not go through a full-scale environmental assessment process; as the scale of impacts and categorization of the project components/ interventions will not require consent/ clearances from Competent Authorities. Therefore, any further approvals or clearances from the GoI or GoM are not envisaged. The ADB guidelines, stipulate addressing environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB Guidelines categorizes the proposed components into categories (A, B or C) to determine the level of environmental assessment required to address the potential impacts. This project on Supporting Human Capital Development in Meghalaya – Babelapara Higher Secondary School up gradation has been categorized as “B” and accordingly this IEE has been prepared to address the potential impacts, in line with the recommended EARF/ IEE content and structure for Category B projects.

II. DESCRIPTION OF EXISTING ENVIRONMENT

22. The project area falls under the West Garo Hills district in Meghalaya, which is located at latitude of 25°27'505" and longitude of 89°56'456" and bounded by Goalpara district, Assam in the North, East Garo district in the east, South Garo hills and Bangladesh in the South, Dhubri district, Assam in the west. To describe the baseline environmental and social features, this section has been sub divided into (i) Physical Environment, (ii) Biological Environment and (iii) Social Environment.

A. Physical Environment

(i) Topography

23. The West Garo Hills district is mostly hilly with plains fringing the northern, western and the south-western borders. There are three important mountain ranges

- **Tura Range:** This is one of the most important mountain ranges in the West Garo Hills. The Tura range is about 50km long and extends in the east-west direction from Tura to

Siju in the South Garo Hills district. The mountain peaks that are located in this range are Tura Peak, Nokrek Peak, Meminram Peak, Nengminjok Peak; Chitmag Peak. The highest peak of this range is the Nokrek (1412m) lying 13 km. South-east of Tura. To the west of the Tura range, low hill ranges run from north to south, whereas to the north of the Tura range, hill ranges run parallel to it, thereby gradually increasing in height till they meet in the south. Now the entire Tura range comes under the management of Nokrek National Park. These high ranges are strictly protected as Catchment areas right from the time of British Administration in Garo Hills. There is no human habitation in the heart of these ranges which has now become an ideal home to various flora and fauna.

- **Arbella Range:** Arbella Peak is 999 metres high. It lies on the northern side of Asananggre village on the Tura Guwahati road. Most of the peaks in this mountain range fall in the East Garo Hills district.
- **Ranggira Range:** This mountain range lies on the western fringe of the district and ends in Hallidayganj village. The height of this peak is 673 metres.

(ii) Climate and Rainfall

- (iii) In general, the district has a mildly tropical climate. The climate of the district is largely controlled by southwest monsoon and seasonal winds. The district being relatively lower in altitude to the rest of Meghalaya, it experiences a fairly high temperature for most part of the year. The average rainfall is 4203.8 mm, of which more than two-thirds occur during the monsoon, with winter being practically dry. The district has mostly dense tropical mixed forest, and a small patch of temperate forest in the higher parts of the Tura range. There are four seasons in the district namely summer, monsoon or rainy, autumn and winter. The summer season extends from the end of March to mid-May, which is characterized by relatively high temperature.
- (iv) Rainy season commences with the onset of southwest monsoon in April and lasts up to October. This is followed by short autumn from mid-October to November. This season indicates the slow retreating of monsoon with clear and sunny sky. Winter season extends from December to the end of March. This is the coldest season of the year with sharp decline in the temperature. Winter is basically dry with lower diurnal range of temperature in the northern and southern foothills, whereas central upland portion experiences temperate climate and the places of medium altitude of the northern, southern and western part of the district experiences sub-tropical climate.
- (v) The district receives a fairly high rainfall throughout the year. Most of the precipitation occurs during the rainy season i.e. between April and October due to southwest monsoon. The average rainfall recorded at the Tura meteorological station is presented in **Error! Not a valid bookmark self-reference..**

Table 2: Average Rainfall (mm) of Tura Station, West Garo Hills

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
22.1	14.7	105	269	514	889	910	643	502	298	13.3	24.2	4203.8

(vi) Seismicity

24. All districts, including West Garo Hills in the state of Meghalaya lies in Zone V. Since the earthquake database in India is still incomplete, especially with regard to earthquakes that had occurred prior to the historical period (before 1800 A.D.), these zones offer a rough guide of the earthquake hazard in any particular region. According to GSHAP data, the state of Meghalaya falls in a region of high to very high seismic hazard. Historically, parts of this state have

experienced seismic activity greater than M6.0 including an M8.1 in 1897. The seismic map of Meghalaya is depicted in the **Figure 2**. Seismic Vulnerability Assessment has been conducted and the outcome of the observation has been attached in the **Annexure 9**

(vii) **Drainage**

25. The topography controls the drainage system. The Tura range forms watersheds in the West Garo Hills district, from which the rivers flows towards Bangladesh plains in the south and the Brahmaputra valley in the north and in the west. The Simsang (Someswari), Jinjiram, Kalu, Ringgi, Didak, Bhogai, Darenetc. River Jinjiram and Simsang (Someswari) are the major rivers of Meghalaya (longest river in the Garo Hills districts), whose valley is of the most important feature to the neighbouring districts.

(viii) **Water Resources**

a. Surface Water

26. The surface water in West Garo hills are mainly the rivers and the wetlands. Few surface water sources are listed below

- Someswari:** This is the largest and the second longest river in the whole district. The river is locally known as Simsang. The chief tributaries are Chibok, Rongdik, Rompa and Ringdi rivers.
- Jinjiram:** It starts from Derek village and its main tributary starts from Upot Lake. It is the longest river in the Garo Hills district.
- Kalu:** Locally this river is called Ganol. Its sources start from Tura peak and runs towards the west through Damalgre, Garobadha and Rangapani before it enters Goalpara district. Its tributaries are Dilni and Rongram Rivers.
- Didak:** It stars from Anogre village and runs through Garo Hills district before it enters into Goalpara district.
- Bogai:** Locally known as Bugi. Its source starts from the southern side of Nokrek Mountains and runs through Dalu village and enters into Mymensingh district in Bangladesh.
- Rongai:** Starts from Arabela peak and runs through Ringgegrevillage and then falls into Jinjiram River. Locally known as Ringge River.
- Dareng or Nitai:** The source is on the southern side of Nokrek Mountain. It runs southwards through Silkigre and enters into Bangladesh. It has many famous deep pools like Warima, Rong'ang, Bamon etc. where Bamon is the deepest. The chief tributaries are Kakija, Daji and Rompa

b. Groundwater

27. As per the study conducted by Central Groundwater Board (CGWB), the net annual ground water availability of the district works out to be 28,850 ham (hectare meter) after deducting the natural discharge during non-monsoon season. The groundwater usage on account of irrigation

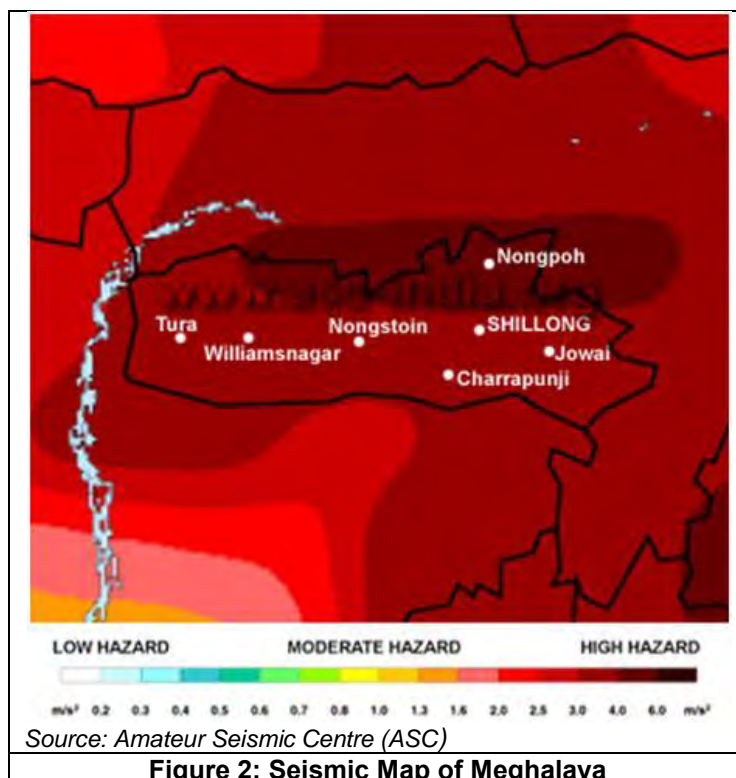


Figure 2: Seismic Map of Meghalaya

is 150 ham and the annual domestic usage is 3.55 ham, the gross groundwater usage for all uses is 153.55 ham. The annual allocation for domestic and industrial uses has been estimated as 2,055 ham based upon the population data projected up to year 2025. The over-all stage of ground water development of the West Garo Hills District is a meagre 0.59% and is categorised as 'SAFE'.

(ix) Air and Noise Quality

28. The Meghalaya State Pollution Control Board is monitoring the Ambient Air Quality in the state under the National Air Monitoring Programme (NAMP) sponsored by CPCB. The frequency of monitoring is twice a week. The monitoring has been performed for Particulate Matter (PM₁₀), Sulfur Dioxide (SO₂) and Oxides of Nitrogen (NO_x). The outcome of the monitoring for West Garo Hills District is presented in the **Error! Reference source not found.** It is observed that the annual concentration of the PM₁₀ (55.6 µg/m³) is close to the permissible limits (60.0 µg/m³) stipulated by CPCB. Other key air quality parameters like SO₂ and NO_x are well within the limits. The increase in PM₁₀ concentration may be due to the wind, increased traffic and other anthropogenic activities.

Table 3: Ambient Air Quality –West Garo Hills District

Month & Year 2011 - 2012	Parameters Tested (Monthly Averages)		
	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)
April'11	45.3	2.0	5.8
May'11	56.0	2.0	7.9
June'11	60.4	2.0	5.4
July'11	56.3	2.0	4.6
August'11	58.0	2.0	4.5
September'11	56.4	2.0	6.2
October'11	56.1	2.0	6.7
November'11	56.3	2.0	6.0
December'11	54.0	2.0	5.7
January' 12	53.3	2.0	4.5
February' 12	55.3	2.0	4.5
March' 12	59.6	2.0	4.5
Annual Avg.	55.6	2.0	5.5
Permissible Limits (Annual avg.)	60	50	40

Source: Meghalaya State Pollution Control Board - Annual Report 2011 -2012

29. During the Diwali festival seasons, Noise quality monitoring has been conducted by the state pollution control board. The noise levels have been monitored before Diwali and on Diwali. The recorded information reveals that, there is a drastic increase in the noise pollution on the Diwali day and it gradually decreases in a week's time after Diwali festival. Apart from the Diwali festival time, increased noise levels are observed in the Highways and major road intersections. However, in general the noise quality of the district is well under control in the settlements. Hence the proposed school upgradation interventions will not have any impact on the existing air and noise quality of the District/ Project area.

(x) Geology & Soil

30. The geological feature of West Garo Hills mainly comprises rocks of Gneissic Complex (quartzofeldspathic gneiss) with enclaves of granites, amphibolites; schists etc. and are exposed mostly in the eastern, central and northern parts of the West Garo Hills district. Southern part of the district is occupied by Tertiary sedimentary rocks, mostly semi-consolidated sandstone, siltstone, clay and marl of Jaintia group, Garo group and Dupitila Formation.

31. The district shows different types of soil as the provenance differs widely. Red Gravelly Soil and Red Sandy Loam in the hilly slopes and Clayey Loam in the plains are the common soil types. The soils are acidic in nature and comparatively rich in organic matter and nitrogen but poor in phosphorous.

B. Biological Environment

(xi) Flora

32. The West Garo Hills is a plateau wherein Nodrek is the highest point which has an altitude of 100 to 1,400 metres above sea level. The flora of this region can be categorised into tropical and sub-tropical. Dense forests of Rewak, Rongrenggre, Rongchugre, Dilma, Phulbari, Songsak, Singimari, Dhima, Emangre, Siju, Darugre, Rajasimlaldeh, Baghmara and others represent the main vegetation of West Garo Hills. Bamboo trees, deciduous, evergreen and semi-evergreen forests are the other trees found here. Mosses, Liverworts, ferns, Asteraceae, Balsaminaceae, etc. Nodrek Peaks, Tura Peak and others are home to sub-tropical vegetation though some deciduous trees are also noticed here. Epiphytic orchids, moss, liverworts and ferns are also common in West Garo Hills.

(xii) Fauna

33. The common avifauna found on the West Garo Hills district are Indian black baza, Barred jungle owlet, Red jungle-fowl, Thick-billed green pigeon, Blue throated barbet, Long-tailed broadbill, Grey-headed myna, Jungle myna, Green magpie, Indian house crow, Red winged crested cuckoo, Large green-billed malkoha, Crow pheasant, Red headed trogon, Redwattled lapwing, Burmese roller, Broad-billed roller, Spur-winged plover, Indian three-toed forest kingfisher.

34. Some other varieties of birds like the White-crested Laughing Thrush, Scarlet Minivet, Black-headed Oriole, Cockoo-shrike, Green Barbet, Chloropsis, Green Himalayan Barbet, White-capped Redstart, Magpie Robin, Yellow Bulbul, Brown Fish Owl, Bee-Eaters, Serpent Eagle, Hill Myna, Pied Myna, Grey-headed Sibia, Slaty-headed Scimitar Babbler as well as various species of Hornbills, Nightjars, Egrets, Parrots, Swallow-Shrikes have also been reported. Reptile fauna includes snakes of different species (Blind snakes, Indian Gamma, Chequered Keelback, Red necked Keelback and Important poisonous species include Indian Cobra and Vipers), lizards (geckos and skinks) and turtle/tortoises.

35. The large number of mammalian fauna includes Hoolock gibbon, Stump-tailed macaque, Rhesus macaque, Assamese macaque, Slow loris, Golden langur, Capped langur, Common monkey, Tiger, Leopard, Clouded leopard, Golden cat, Leopard cat, Marbled cat, Jungle cat, Large Indian civet, Masked Palm civet, Binturong, Indian Grey mongoose, Indian fox, Himalayan Black bear, Yellow Throated marten, Yellow-Bellied weasel, Madras Tree shrew, Indian flying squirrel, Malayan Giant squirrel, Bandicoot rat, Lesser Bamboo rat, Black Napped hare, Rufous-tailed hare, Sambar, Gaur, Indian Crested porcupine, Cheetal, Muntjac or Barking deer, Indian elephant, Wild dog, Indian Wild boar and Different Species of Bats.

(xiii) Protected area

36. **Nokrek National Park** or **Nokrek Biosphere Reserve** in West Garo Hills district, Meghalaya serves as the home for the red pandas which are on the verge of extinction. The national park is also classified as a Biosphere Reserve and was added to UNESCO's Biosphere Reserve list in 2009. The national park is located about 2 km away from the Tura

Peak. The national park has strict rules for exploring the core area where the red pandas dwell. Another important animal that is found in the national park is the Asian elephant. The biosphere reserve provides a safe habitat to the Asian elephant. Other animals that can be spotted in the park are tigers, eight species of cats including the marbled cat, the rare stump tailed macaque, pig-tailed macaque, Hoolock Gibbons and seven species of primates. Many species of birds can also be spotted and the national park is considered to be an important bird area.

37. A thick canopy of lush green forest cover provides habitats for several insects and allows sustainability for the food chain. Memang Narang, also known as Citrus Indici, the mother germoplasm was discovered in the Nokrek National Park which led to the establishment of the National Citrus Gene Sanctuary and Biosphere Reserve that covers an area of 47 sq km. The terrain of the national park is dominantly hilly with high amounts of iron found in the rocks. All the important rivers that flow through the Garo Hills originate from the Nokrek Hills. Of all the rivers, Simsang River is considered to be most important.

C. Social Environment

(xiv) Demographic Profile

38. As per the census 2011, the West Garo Hills is having population of 643,291 of which male and female were 324,159 and 319,132 respectively. The district population growth has seen an increase of 24.09 % in comparison with 2001 census. Average literacy rate of West Garo Hills in 2011 were 67.58% (male and female literacy were 72.39% and 62.70% respectively) compared to 50.69% of 2001. With regards to Sex Ratio in West Garo Hills, it stood at 984 female per 1000 male. The density of West Garo Hills district for 2011 is 175 people per sq. km.

(xv) Socio Economic Features

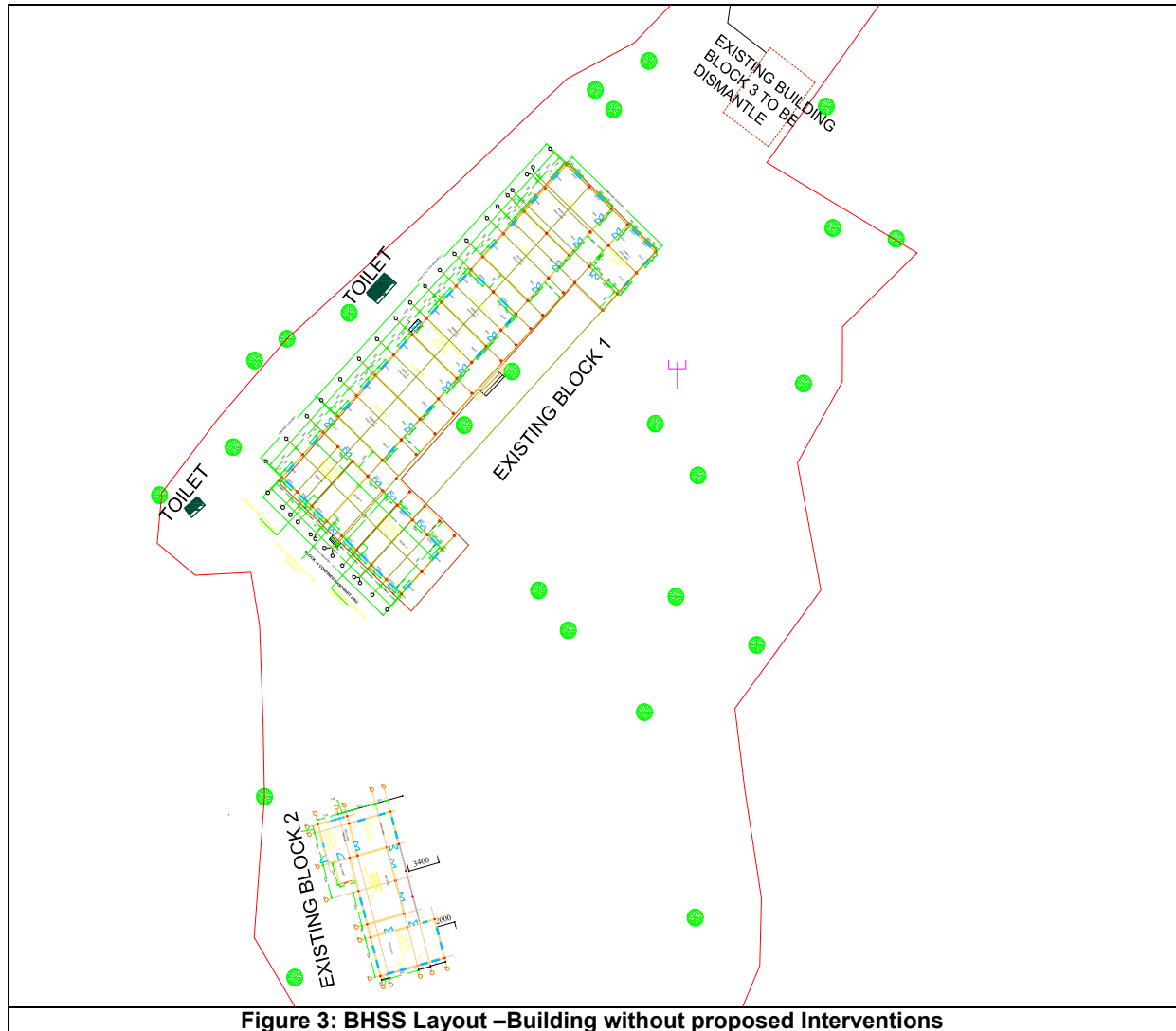
39. The economy of the district is basically agrarian in nature and about 62% of the persons engaged in economic activities are engaged in agricultural activities. Paddy is the major crop. The agro climatic conditions of the district are conducive for various agricultural activities. Rice is the most important of the food crops grown in the district. Other main crops grown are maize, millets, tapioca, other pulses and cereals etc. The increased demand for jute-mesta, mustard, ginger, cotton and other cash crops has also encouraged farmers to increase their cultivation for these crops (Census 2011).

40. As per Census 2011, the district has 255693 persons (151914 males and 103779 females) engaged in economic activities. The percentage of Cultivators is the most astounding with 47.22 percent out of which male cultivators are 44.96 percent and female cultivators are 50.53 percent. The percentage of other categories is the second most elevated in the district with 34.25 percent of which 40.25 percent are males and 25.47 percent are females. Persons engaged in agricultural activities are at 15.54 percent which incorporate male workers at 12.53 percent and female workers at 19.93 percent. Persons working in Household industries have the least percentage with 2.99 percent of which males are 2.26 percent and females are 4.06 percent. Female cultivators are the most astounding in percentage (50.53%) in the whole district.

III. PROJECT FACILITIES, IMPACTS AND MITIGATION MEASURES

A. Project Facilities

41. BHSS campus has three functional blocks B1, B2 and B3. B1 is used for both education and administration purposes. B2 is used only for educational purpose and B3 is used as storage room. The layout of the BHSS is depicted in the **Figure 3 & 4**.



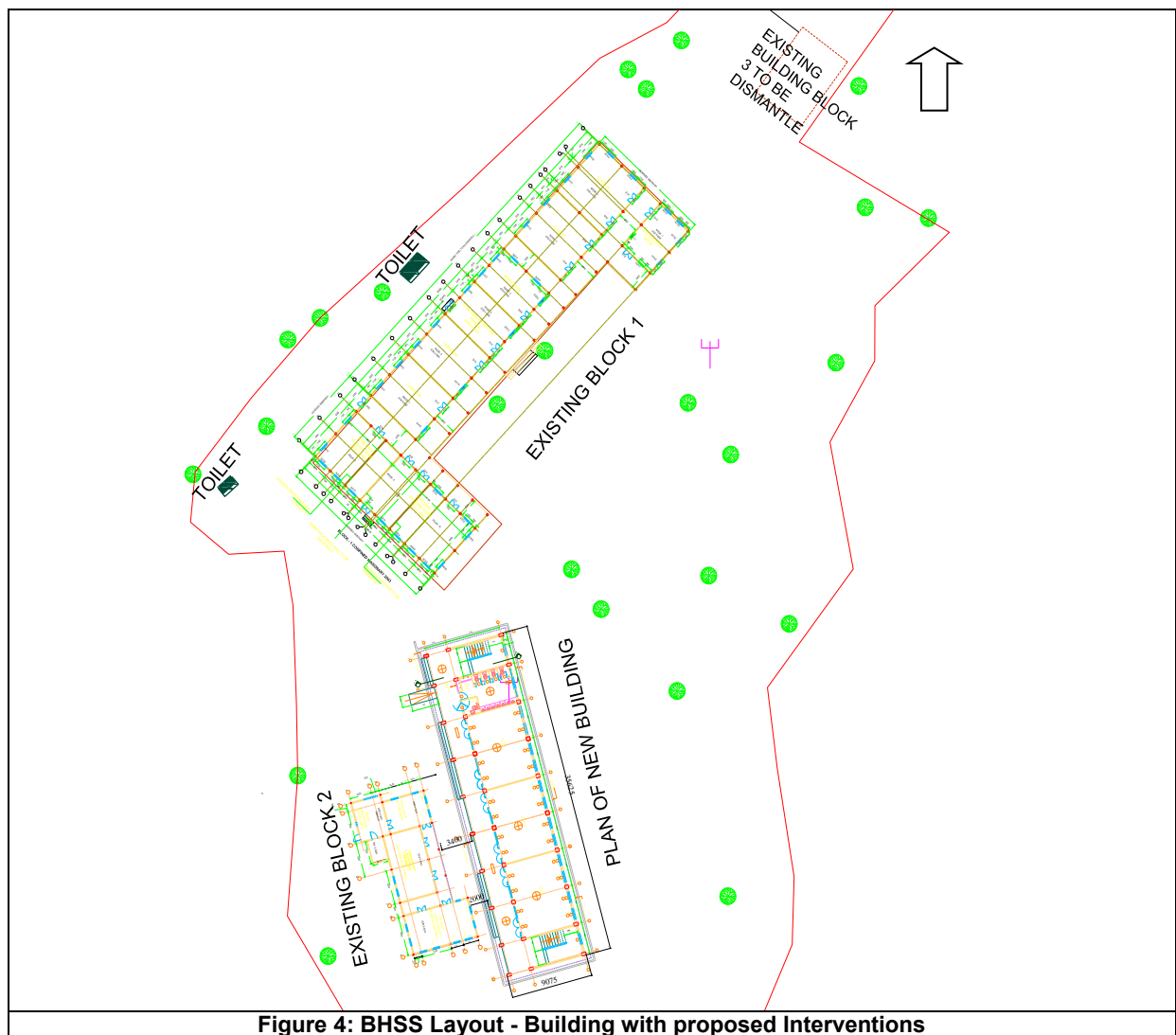


Figure 4: BHSS Layout - Building with proposed Interventions



Block 1



Block 2



Block 3



Approach road



Class XI



Staff room

B. Description of the School Buildings, existing condition and proposed Interventions

School Infrastructure	Type of structure	Usage	Existing Condition	Proposed Improvements	Remarks
Block- B1	Single storied – Masonry structure	Number of rooms: 10 Class rooms – 7, class XI, XII, IXA, IXB, IXC, XA and class XB, Head master room, Staff room 1 and Staff room 2	<ul style="list-style-type: none"> Cracks in walls of head master room, class XI, XII, IXA, IXB and both staff rooms; Floors are damaged in class IXA, IXB, IXC, XA and XB; Wooden planks are used as partition between class IXC & class XB and between class XB & class XA; Seepage in walls of all the rooms; 	<ul style="list-style-type: none"> Crack portion shall be hacked and chipped and re-plastered with polymer based mortar; The existing floor shall be hacked and chipped off and the surface shall be cleaned properly and plastering with neat cement finish; Wooden planks shall be replace with 125mm thick brick work; Seepage portion shall be hacked and chipped off and cleaned properly then re-plastering with 	

School Infrastructure	Type of structure	Usage	Existing Condition	Proposed Improvements	Remarks
			<ul style="list-style-type: none"> Improper ceiling (bamboo mesh) used in all the rooms. 	water proofing compound; <ul style="list-style-type: none"> Dismantling the existing ceiling and 3 mm ply ISI marked with proper framework and beading shall be done. <u>Global Solution:</u> Horizontal seismic band shall be provided at the lintel level all around the building from both inside and outside. 	
Block – B2	Single storied – Masonry structure	Number of rooms: 4 Unused rooms - 4	<ul style="list-style-type: none"> Cracks in walls of all the rooms; Floors are damaged in all the rooms; Improper ceiling (bamboo mesh) used in all the rooms. 	<ul style="list-style-type: none"> Crack portion shall be hacked and chipped and re-plastered with polymer based mortar; The existing floor shall be hacked and chipped off and the surface shall be cleaned properly and plastering with neat cement finish; Dismantling the existing ceiling and 3 mm ply ISI marked with proper framework and beading shall be done. <u>Global Solution:</u> Horizontal seismic band shall be provided at the lintel level all around the building from both inside and outside; One additional member shall be provided at the roof truss. 	
Block – B3	Single storied – Assam type structure	Number of room: 1 Store room	<ul style="list-style-type: none"> Cracks in ikra walls; Floor damaged; Ceiling absent. 	<ul style="list-style-type: none"> Construction of a new G+1 RCC building. New building shall have provisions for a science lab, computer room, 4 classrooms and 2 toilet blocks – one each for boys and girls. 	<ul style="list-style-type: none"> The existing building Block B3 is in unusable condition and hence it has been decided to dismantle the old building.

School Infrastructure	Type of structure	Usage	Existing Condition	Proposed Improvements	Remarks
				<ul style="list-style-type: none"> There will be 12 units in boy's toilet block and 9 units in girl's toilet block. This includes one extra unit for differently able persons in boys toilet block. 	
Toilet	Toilet block 1: For girls	Number of unit: 2	<ul style="list-style-type: none"> Poor condition 	<ul style="list-style-type: none"> Water storage, flushing system, etc., will be upgraded 	<ul style="list-style-type: none"> 2 new toilet blocks shall be provided in new building
	Toilet block 2: For teachers	Number of unit: 2			
Water supply	PHE pipeline		<ul style="list-style-type: none"> School has a PHE connection. The water is collected in a PVC tank of 1000 litres capacity. Water availability from PHE connection is limited to 1000L daily. 	<ul style="list-style-type: none"> Water from PHE Connection will be collected in a PVC tank of size 1000 X 2 litre (one new and one existing) capacity from where it will be pumped into the PVC tank of 2000 litres placed above stair head. As per the CGWB booklet, area comes under the suitable ground water development area, iron content is present in ground water and Pre monsoon ground water level is approximately 4.0 M. Thus, for potable use, iron removal with necessary PH moderator has been proposed in addition. Therefore, water from PHE supply will be treated in iron removal unit and then will be collected in RCC tank of (1.2X1.2X1.35 m) before filling the potable PVC of 2000 litres placed next to non-potable PVC tanks. 	
Electricity provisions	There is a 2 phase		<ul style="list-style-type: none"> There is no proper wiring in school 	<ul style="list-style-type: none"> Wiring shall be done in looping 	

School Infrastructure	Type of structure	Usage	Existing Condition	Proposed Improvements	Remarks
	power connection		building	system with copper PVC cable 250/440 volt grade of size 1.5 sqmm of approved quality using PVC casing capping including 5 amperes switch Indian best quality ceiling rose etc capable to a highest point. <ul style="list-style-type: none"> • 2 additional tube lights, 4 CFL lights and 5 fans shall be provided 	
Play Area	School does not have any dedicated play ground				
Type of approach road	Metalled road		<ul style="list-style-type: none"> • The school can be accessed by a 300m long metalled road branching out from Major District Road (MDR5). The road width is 4 metre 		
Trees within the school campus (if any)			<ul style="list-style-type: none"> • There are approx. 40 trees in the school campus 		<ul style="list-style-type: none"> • 6 nos of trees may be affected due to proposed improvements

C. Impacts and Mitigation Measures

42. Being a localised construction activity at a minimal scale (repair, restoration and retrofitting of the existing school building, provision of drainage, introducing water harvesting and improving the existing infrastructure facilities), the proposed project activities are not anticipated to have major environmental impacts during the project construction and operation stages. However, irrespective of the scale of the construction activity, the proposed interventions shall have minimal temporary environmental impacts. The following section will discuss the anticipated environmental impacts and management measures that need to be adopted. It also specifies the roles and responsibility of the contractor, DSC and PMC.

43. The negative environmental impacts associated with the proposed project interventions includes generation of dust and noise pollution during the building demolishing activities, excavation and earth works, land grubbing, transportation and storage of construction materials etc. If the construction safety is not adopted in the construction camp and labor camp, the proposed intervention shall have occupation health hazards to the labourer's and the public. The soil erosion is a predominant environmental impact which arises during the construction of any infrastructure projects in the hilly area; the project site being a hilly area, appropriate mitigation measures has to be adopted in containing the soil erosion. The soil and water pollution due to the surface runoff is anticipated during the project construction stage, hence major construction activities shall be temporarily retained during the monsoon period. The project area shall also

has natural disaster and extreme climate events, however, these impacts are not anticipated to be project induced but rather, they are related to the geographical location of project site.

44. The proposed project intervention shall also has positive environmental and social impacts, this includes

- Upgrading classrooms/ buildings to have ample natural light and good ventilation to the students and staffs.
- Provision of safety to the students and staffs by upgrading the building strength to withstand against natural calamities (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 which will enhance knowledge and awareness for sustainable school infrastructure development in the future.

D. Environmental Management Plan (EMP)

45. The following EMP Table 4 summarizes the impacts that are expected to arise from the project activities. The Site specific EMP has been prepared for the sub project and given in Table 5

Table 4: Environmental Management Plan (EMP)

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
Pre Construction Stage						
1.	Approvals/NOC Licences and Permits/ Insurance.	<ul style="list-style-type: none"> Illegal activity 	<ul style="list-style-type: none"> All necessary approvals, permits and licences required by the state and local legislation shall be obtained prior to commencing of the construction activity. All approvals, permits and licences shall be maintained and up dated before expiry, 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 The contractor shall maintain Pollution Under Control (PUC's) Certificates for the construction vehicles and machineries used for this project. Contractors shall insure all workers covered under the group insurance or any other suitable insurance schemes against all forms of injuries sustained at the workplace. All migrant labourers engaged by contractors, has to possess Work Permit issued by GoM/ADCs/Under Inter State Migrant (Regulation of employment and services Act 1979). 	<ul style="list-style-type: none"> Contractor shall obtain all necessary NOC and licences and permits, clearances etc required; for the construction activities. 	<ul style="list-style-type: none"> DSC/ PMC Labour/Work permit license, Group Insurance for labourers and PUC for Vehicles and Machineries as annexed. 	Prior to start of construction activity and at regular intervals mainly during license/ permit expiry/renewal time.
2.	Access, utility relocation	<ul style="list-style-type: none"> Disruption to local amenities 	<ul style="list-style-type: none"> 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 of closure, not 	<ul style="list-style-type: none"> DSC to prepare preliminary list and maps of utilities that needs to be shifted. Contractor needs to prepare the list 	<ul style="list-style-type: none"> DSC/ PMC Utility shifting is not required for this project. 	<ul style="list-style-type: none"> Monthly monitoring

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<p>less than 24 hours prior to such closure.</p> <ul style="list-style-type: none"> Any legal access/right of way affected by the works shall be reinstated to an original/ equivalent standard/level. Normal access to public roads and properties shall be maintained throughout the full duration of the construction works. 	of the operators of utilities who has to be shifted		
3.	Loss of land	<ul style="list-style-type: none"> Land acquisition Socio economic Impacts 	<ul style="list-style-type: none"> 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. 	• DSC/PMU	• PMC/PMU	• Monthly monitoring
4.	Clearing of trees/Removal of vegetation	<ul style="list-style-type: none"> Loss of trees and vegetation Soil erosion and surface runoff 	<ul style="list-style-type: none"> 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 As per the proposed design, felling of trees is not envisaged at any stage of the project. However under unavoidable conditions if any of the trees are required to be cut/ felled, then prior permission as per existing procedure from Forest/ADCs, ensuring appropriate compensation including compensatory plantation as stipulated by the forest department/ADC shall be undertaken. Avoid earthworks/breaking of land during monsoon season. 	• Forest Department/ ADC PMU	• PMU	• Fortnightly/ Monthly monitoring
5.	Drainage management	<ul style="list-style-type: none"> Drainage congestion due to garbage/wast 	<ul style="list-style-type: none"> As per the topography of the project site, it is located on a flat terrain (53m elevation) and slopes towards southwest direction; accordingly appropriate sediment control 	• Contractor / DSC	• DSC/ PMC	• Weekly/ Monthly monitoring

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		<ul style="list-style-type: none"> • e dumping • Water logging. • Vector proliferation 	measures will be designed and implemented prior to commencing of construction. <ul style="list-style-type: none"> • Design adequate drainage passage by following natural path. • Ancillary structures and work compounds shall be located at least 20 meters away from any built or natural drainage lines, springs/rivulets/water bodies. • Fill ditches/water logging in school premises. • Discharge drainage flow with proper downstream protection. • No silt trap is required as no natural drainage lines are located closed to the school campus • Regular cleaning of drains within the school premises and construction site including discharge points to storm water/main drains. 			
Construction Phase						
6.	Slope stability	<ul style="list-style-type: none"> • Landslide or gully erosion on slopes that may threaten school infrastructure. 	<ul style="list-style-type: none"> • Planning and designing the refurbishment/ upgrading of schools. • Keeping in mind the fragile natural environment and site specific geological conditions. • Avoid or maintain adequate distance from erosion prone areas. • Adopt right angle of cut on slopes. • Stabilize slopes by engineering and bioengineering measures. • Measures taken to avoid undercutting of hill toes that may cause slides. • Do not exert excess load on slopes by disposing spoil. 	• Contractor	• DSC/ PMC	<ul style="list-style-type: none"> • Weekly basis during the monsoon season and monthly monitoring during non monsoon season
7.	Erosion and sediment	<ul style="list-style-type: none"> • Loss of soil, water pollution 	<ul style="list-style-type: none"> • Temporary erosion and sediment controls like having vegetation, surface covering etc., 	• Contractor	• DSC/ PMC	<ul style="list-style-type: none"> • Weekly basis during the monsoon

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<p>shall be installed prior to the commencement of any works with the potential to cause soil erosion, including stockpiling of construction materials.</p> <ul style="list-style-type: none"> 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. 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. A Minimum of 4 cubic feet of topsoil in the construction area shall be stripped and stockpiled later for re-spreading on all exposed areas when final shaping has been completed. Fill material shall not be placed around or pushed up against the base of the trees and shrubs that needs to be retained within the construction site. All fill shall be sufficiently compacted to minimize erosion potential. All exposed soil areas shall be stabilized and re-vegetated as soon as possible on completion of works to prevent potential erosion. 			season and monthly monitoring during non monsoon season
8.	Spoil Management	<ul style="list-style-type: none"> Drainage blockage causing localized ponding and/or slush/muddy 	<ul style="list-style-type: none"> Minimize spoil disposal by balancing cut and fill wherever possible Manage spoil to reclaim land with proper landscaping and vegetation Do not dispose spoil on drainage path A Comprehensive Disposal Plan of 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> DSC/ PMC 	<ul style="list-style-type: none"> Daily inspection by contractor Weekly visual inspection by DSC Random inspection by PMC & PMU

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		runoff. • Spoil tipped over slope may cause slide	construction waste/debris; solid waste etc. • 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 at site for the construction workers			
9.	Water Pollution	• Impact on existing water resources • Contamination of ground water and other water bodies. • Impact on school drinking water sources.	• Domestic effluent/Sewage shall be discharged into septic tanks with soak pits/bio-toilets. • Total prohibition on direct discharge of sewage/sullage/solid waste into drains, open spaces, water bodies to ensure downstream/adjoining settlement are not affected at any through water borne diseases. • Assess capacity and structural integrity of existing septic tanks in all schools where the project provides new class rooms / toilets; take appropriate measures for augmentation of septic tank as per additional sewage generation.	• Contractor	• DSC/ PMC	• Monthly Monitoring
10	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 • Diesel and other lubricant oil shall be stored in a covered area with hard surface/paved surface provided with spill trays to prevent soil pollution. • Any transportation of materials on local roads shall be done during day light hours. • All vehicle movements or other construction	• Contractor	• DSC/ PMC	• Daily / weekly inspection during construction

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<p>activities shall be restricted to the delineated construction zone, the existing road network or previously disturbed areas.</p> <ul style="list-style-type: none"> • Construction vehicles, personnel and machinery shall not enter fenced off areas or areas beyond the delineated construction zone • Appropriate signage should be given to the designated areas (storage/ restriction of entries/toilets/ laboratory etc.,) in the construction area/workers camp. 			
11	Stone crushing	<ul style="list-style-type: none"> • Dust and noise pollution 	<ul style="list-style-type: none"> • Locate crusher plant, if any, away from settlement, school, and forest areas. • Enclose and use water sprinklers to arrest dust. • Buy required material from authorized operating plants/quarries. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • During the procurement of construction materials
12	Air and noise pollution and fugitive emissions	<ul style="list-style-type: none"> • Dust nuisance to children from construction works • Dust and noise generated by vehicles passing by schools • Loud noise during construction • Gaseous Emissions 	<ul style="list-style-type: none"> • Wherever feasible, dust generating type of work shall be done. during off-school time • Construction work shall be limited to day light hours. • The contractor shall provide HDPE construction impermeable scaffold safety net (1442 m) at site to control dust pollution. • Labourers' use of masks and safety gears. • Water sprinkling on dust prone work areas. • Vehicles transporting construction materials to site must be covered to prevent dust pollution. • Cover fine grain construction materials with tarpaulin or sheets. • Cover construction debris and waste prior to disposal. • Newly exposed surface areas shall be mulched and replanted as soon as possible 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • Daily inspection by contractor • Weekly visual inspection by DSC • Random inspection by PMC & PMU

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<p>in order to reduce the potential for erosion and suppress dust</p> <ul style="list-style-type: none"> • All vehicles, construction machineries and equipment will be maintained so that emissions conform to National Ambient air quality standards • All vehicles, construction machineries and equipment should possess Pollution Under Control Certificates (PUC's) • Face masks can be provided for the school children, teachers and school personnel including workers at site in case of excessive dust generation. 			
13	Water Quality	<ul style="list-style-type: none"> • Construction waste water impact 	<ul style="list-style-type: none"> • The required water will be sourced from the PWD/ PHED. In absence of the water supply, the contractor shall obtain necessary clearance from the competent authority for utilising surface/groundwater. • Construction waste and debris under no circumstances be dumped/discharged/released into surrounding water bodies. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • Biannual/02 season.
14	Wildlife/Fauna	<ul style="list-style-type: none"> • Threat to wild animals/ fauna 	<ul style="list-style-type: none"> • Construction workers will protect natural resources & wild animals (including avifauna). • Hunting will be prohibited 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • Quarterly.
15	Employment opportunity	<ul style="list-style-type: none"> • Local people employed in project activities 	<ul style="list-style-type: none"> • Contractors are encouraged to use local labour, wherever possible. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • Monthly.
16	Waste management and minimization	<ul style="list-style-type: none"> • Impacts on land, water and visual impacts showing poor 	<ul style="list-style-type: none"> • Recycled materials shall be used to the limits of design. • Any construction waste generated from the construction site shall be contained within the boundary of the site and removed at regular 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • DSC/ PMC 	<ul style="list-style-type: none"> • Daily / weekly inspection

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		housekeeping practices.	intervals to an appropriate, authorized waste disposal or recycling facility. <ul style="list-style-type: none"> • The Municipal Solid Waste (MSW) generated in the construction and labour camp shall be separated as organic and inorganic wastes. • The worksite shall be left in a tidy and rubbish free state upon completion of the works • There should be no burning of waste. • Segregation of waste at source be adopted. • Composting shall be practised for organic waste. The compost shall be used to raise plants/ landscaping within the school premises. 			
17	Occupational Health and Safety	<ul style="list-style-type: none"> • Lack of safety tools • Lack of safe construction practices. • Accidents occurring on site • Site and task specific hazards • Lack of minimum required facilities of space, ventilation, sanitation, light and safe drinking water in labour 	<ul style="list-style-type: none"> • Highest priority to safe construction practices • Provide safety gears to workers working in hazardous areas and provide training in the use of these safety gears • Keep first aid box ready at work areas and camps • Provide adequate space with ventilation, clean toilet/ bio toilet (1 no), solid waste management, light and safe drinking water in camps. • Provide mosquito nets at labour camps • Separate covered / walled toilet rooms (including bathing platforms) shall be provided for male and female labourers • Keep camp and work area clean and without water logging • Fire fighting equipment like fire extinguishers will be provided in the camp as per fire safety standards. • Compulsory use of PPE like helmets, boots, gloves, eye protection gear, face mask and 			<ul style="list-style-type: none"> • Monthly/At random inspection

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		camps.	other safety measures • Display prominently telephone/contact number of nearest ambulance service, health units			
18	Community, health and safety.	• Security and safety of the school children, teachers and staff and community members. • Vector disease	• Wire Mesh Barricading / Fencing (140 m) will be provided for the construction and labour camps sites to fully separate construction activities from school yards and buildings to prevent injuries and health hazards particularly to school children • Fire fighting equipment like fire extinguishers will be provided in the construction site as per fire safety standards.	• Contractor	• DSC/ PMC	• Monthly/At random inspection
19	Use of wood as construction materials	• Deforestation	• Minimize use of wood for construction • Use local materials as much as possible • Innovations shall be integrated within the design to make schools more environment-friendly for students.	• Contractor	• DSC/ PMC	• Weekly inspection
20	Cooking and heating with firewood by construction workers.	• Deforestation	• Contractor shall supply kerosene or LPG at camps and restrict cooking and heating using firewood.	• Contractor	• DSC/ PMC	• Daily / weekly inspection
21	Influx of migrant workers	• Health and safety risks • Chances of spread of sexually transmittable diseases like AIDS • Water	• Local labourer's to be given preference for job opportunities and each contractor should be bound by this commitment • Ensure labour-related regulations are met • In case of hiring outside labour, ensure that their working conditions as well as camps meet local regulations and the best practices of the industry	• Contractor	• DSC/ PMC	• Weekly inspection

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		pollution				
Operation Phase						
22	Maintenance of the school infrastructure facilities	<ul style="list-style-type: none"> Damages to school property due to inadequate maintenance. 	<ul style="list-style-type: none"> Maintenance activities that needs to be carried out by SMC as and when required. Maintenance registers to be maintained. 	<ul style="list-style-type: none"> Contractor (during DLP). PMU (SMC) (after contractor DLP) 	<ul style="list-style-type: none"> DSC/ PMC (during contractor DLP) PMU (after DLP) 	<ul style="list-style-type: none"> Monthly Inspection
23	Health and hygiene	<ul style="list-style-type: none"> Un-hygienic drinking water leading to health issues Lack of sufficient quantity of water for drinking and sanitation 	<ul style="list-style-type: none"> Drinking water quality to be tested at least twice a year. The students to be made aware on the importance of conservation of water. The sanitary facilities to be cleaned on a regular basis. Sufficient water storage facilities from both piped and rain water sources. 	<ul style="list-style-type: none"> Contractor (during DLP). PMU (SMC) (after contractor DLP) 	<ul style="list-style-type: none"> DSC/ PMC (during contractor DLP) PMU (after DLP) 	<ul style="list-style-type: none"> Monthly Inspection

Table 5: Site Specific EMP for the Sub-Project

Sl. No	Project Activity	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
A. Pre Construction Stage					
1.	Environmental Monitoring	<ul style="list-style-type: none"> Water Quality Monitoring - Near site, one each for ground water and surface water (Minimum two samples at each sub-project/ site). 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> Once
		<ul style="list-style-type: none"> Air Quality Monitoring - Twice a week @ 2 locations (upwind and downwind) at each sub-project/ site 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> Once
		<ul style="list-style-type: none"> Noise Monitoring - Once before construction stage at sub-project/ site. 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> PMC 	<ul style="list-style-type: none"> Once
B. Construction Phase					
2.	Dust Control Measures	<ul style="list-style-type: none"> The contractor shall provide HDPE construction impermeable scaffold safety net (1442m) at site 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> DSC/ PMC 	<ul style="list-style-type: none"> Daily inspection by contractor Weekly visual inspection by

Sl. No	Project Activity	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
		to control dust pollution.			DSC • Random inspection by PMC & PMU
3.	Labour Camp	<ul style="list-style-type: none"> • Provide anaerobic bio toilet (one) in labour camp • Provide bathroom with soak pit (one) in labour camp 	• Contractor	• DSC/ PMC	• Monthly/At random inspection
4.	Safety Measures	• Wire Mesh Barricading / Fencing (140 m) will be provided for the construction and labour camps sites to fully separate construction activities from school yards and buildings to prevent injuries and health hazards particularly to school children	• Contractor	• DSC/ PMC	• Monthly/At random inspection
5.	Environmental Monitoring	• Water Quality Monitoring - Near site, one each for ground water and surface water (Minimum two samples at each sub-project/ site).	• PMC	• PMC	• Once in a year
		• Air Quality Monitoring - Twice a week @ 2 locations (upwind and downwind) at sub-project/ site	• PMC	• PMC	• Once in a year
		• Noise Monitoring - Once after construction stage at sub-project/ site.	• PMC	• PMC	• Once in a year
C. Operational Phase					
6.	• Tree Plantation	• Supplying of 10 numbers of locally available saplings of ornamental/fruit/broad leaf/conifer species according to site as per understanding with School Management Committee (SMC) and necessary planting and maintenance by SMC.	• SMC	• DSC/PMC/PMU	• Monthly
7.	• Environmental Monitoring	• Water Quality Monitoring - Near site, one each for ground water and surface water (Minimum two samples at each sub-project/ site).	• PMC	• PMC	• Once
		• Air Quality Monitoring - Twice a week @ 2 locations (upwind and downwind) at sub-project/ site	• PMC	• PMC	• Once
		• Noise Monitoring - Once after construction stage at sub-project/ site.	• PMC	• PMC	• Once

IV. INSTITUTIONAL ARRANGEMENT

46. Based on consultations with the RMSA project directorate in Shillong, Meghalaya, it was found that there is no existing institutional setup, position, or assigned personnel in DOE for monitoring environmental safeguards issues. The Public Works Department (PWD), Government of Meghalaya (GOM), is mainly responsible for planning, designing, and implementing civil works projects in the state. The PWD engineers are generally assigned additional environmental tasks in addition to their technical responsibilities. In view of this situation, the following measures will be taken:

- (i) The project director to be nominated by GOM will be designated as the focal point for all environment and social safeguard issues.
- (ii) The project director will be assisted in his/her work by the two environment specialists who will be engaged under the loan as part of the project management consultants (PMCs) and the design and supervision consultants (DSCs).
- (iii) The environmental specialists will undertake initial environmental examination (IEE) of selected schools and TTCs in line with the EARF. They will prepare an environmental management plan (EMP) for each site and ensure that the principles and processes laid down in the EARF are followed.
- (iv) The environment specialists will work with DOE and PWD staff that is designated to project implementation unit 1 (PIU1) to ensure that all refurbishment works comply with the environmental legislation and policies of the government and ADB.
- (v) They will also facilitate capacity development activities for DOE and PWD staff in Shillong (capital of Meghalaya) as well as in each district headquarter. They will prepare the required manuals and procedures, and guide DOE and PWD on how best to institutionalize the function of environmental safeguards.
- (vi) The environmental specialists will prepare semi-annual monitoring reports and submit these to GOM and ADB. They will guide the project director and PIU1 in terms of handling grievances pertaining to environmental safeguards.

Table 6: Mechanism for Implementation of EMP

Sl. no	Activities	Responsibility	Remarks
1.	Environmental Assessment and Management		
1.1	Prepare the IEE report as relevant	DSC/PMC	
1.2	Environmental screening of proposed works using the REA checklist	PMC	REA checklist (Refer Annexure - 1) provided in the EARF. Categorizes the environmental type
1.3	Follow procedures in EARF to prepare the environmental assessment reports depending on the results of REA	PMC	Follow provisions of the approved EARF
1.4	Prepare EMP as part of the IEE report.	PMC	Follow the steps given in the approved EARF
1.5	Incorporation of EMP provisions in contract documents	DSC/PIU4	EMP requirements to be clearly defined in contract agreement
2.	EMP Monitoring		
	During implementation - verification through field visits	PMC/DSC	The environmental specialist of the PMC and DSC will conduct routine monitoring, document compliance or non-compliance, fill monitoring checklists, and prepare semi-annual reporting. He/she will check adequacy of environmental safeguards

Sl. no	Activities	Responsibility	Remarks
			maintained in district works, and verify if EMP's recommendations are being complied with. Consolidate semi-annual progress report. (Refer Annexure - 4 and 5 for environmental monitoring and reporting formats)
3.	Monitoring and Auditing		
	Compliance Audit during annually implementation	PMC/DSC/SMC/ DPCU	Visits to random sites. Verify overall compliance.
4.	Annual Reporting & Feedback		
	Interactions/workshops reports	PIU1	PMC will conduct an annual interaction with various DPCUs to encourage replication of best practices.

EARF = Environmental Assessment and Review framework, DSC= Design Supervision Consultant, PMC = Project Management Consultant, SMC = School Management Committee

V. ENVIRONMENT MONITORING PLAN

47. Through integration of mitigation measures in project design, impacts are mostly insignificant, temporary in nature and can be properly avoided or mitigated by following proposed mitigation measures given in the EMP (**Table 4**) of this IEE report.

A. Summary of Site and Activity-Specific Plans

48. The following **Table 7** summarizes site and activity-specific plans with responsibilities to be adopted

Table 7: Site and Activity Specific Plans/Programs as per EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Detailed Design Phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion	DSC/PMC	Contractor
Detailed Design Phase	List of utilities and corresponding maps showing utilities to be shifted	Utilities shifting	DSC/PMU (SMC) during preliminary stage Contractor as per detailed design	Contractor
Detailed Design Phase	Contingency plan	Mitigate impacts due to interruption of services during utilities shifting	Contractor	Contractor
Detailed Design Phase	Chance find protocol	Address archaeological or historical finds	DSC/PMC	Contractor
Detailed Design Phase	List of pre-approved sites	Location's for work camps, areas for stockpile, storage and disposal	DSC/PMC	Contractor
Detailed Design Phase	Waste Management Plan	Mitigate impacts due to waste generation	Contractor	Contractor
Detailed Design Phase	Health and Safety plan	Occupational health and safety	Contractor	Contractor
Detailed Design Phase	Traffic Management Plan	Mitigate impacts due to transport of materials and pipe laying works	Contractor	Contractor

B. Environmental Monitoring Program

49. The environmental monitoring plan forms the basis for verifying the extent of compliance during the implementation stages of the project. Implementation of mitigation measures will be ensured through both routine and periodic monitoring (refer Annexure – 4 for environmental monitoring format). Monitoring activities for project during the construction and operation phases are given in the following **Table 8**.

Table 8: Environmental Monitoring Program

Sl. No	Indicators of Monitoring	Types of Monitoring/ Method of Monitoring	Monitoring Frequency	Responsibility
Pre - Construction Stage				
1.	Drinking Water Quality- Ground and Surface	Grab sampling method shall be adopted and analysis shall be done as per Standard Methods for Examination of Water and Wastewater	Once	PMC
2.	Air Quality Monitoring	High volume air sampler to be located 50m from the project site in the downwind direction. Use method specified by CPCB for analysis	Once	PMC
3.	Noise Monitoring	The equivalent noise levels shall be measured using an integrated noise level meter kept at a distance of 15m from edge of project site.	Once	PMC
Construction Stage				
1.	Drinking Water Quality- Ground and Surface	Grab sampling method shall be adopted and analysis shall be done as per Standard Methods for Examination of Water and Wastewater	Once in a year	PMC
2.	Air Quality Monitoring	High volume air sampler to be located 50m from the project site in the downwind direction. Use method specified by CPCB for analysis	Once in a year	PMC
3.	Noise Monitoring	The equivalent noise levels shall be measured using an integrated noise level meter kept at a distance of 15m from edge of project site.	Once in a year	PMC
4.	Transportation of construction material in covered condition, and safe loading & unloading of construction materials	Visual observation	Daily/ weekly during construction	Contractor/ DSC
5.	Stockpiling of excavated materials	Visual observation	Daily/ weekly	Contractor/ DSC
6.	Reuse of excavated materials	Visual observation	Daily/ weekly	Contractor/ DSC

Sl. No	Indicators of Monitoring	Types of Monitoring/ Method of Monitoring	Monitoring Frequency	Responsibility
7.	Solid waste segregation disposal	Visual observation	Daily/ weekly	Contractor/ DSC
8.	Clearing of trees	Visual observation	Regular during construction	Contractor/ DSC
9.	Occupational health and safety, use of safety gears	Visual observation	Once a month	Contractor/ DSC
10.	Safety to students	Record of injury	Once a week	Contractor/ DSC
11.	Water logging and vector proliferation	Direct observation	Once a week	Contractor/ DSC
Operation Stage				
12.	Preparation of monitoring reports	Preparation of monitoring reports	Monthly	PMU (SMC)
13.	Drinking water quality Ground and Surface	Grab sampling method shall be adopted and analysis shall be done as per Standard Methods for Examination of Water and Wastewater	Once	PMC
14.	Air Quality Monitoring	High volume air sampler to be located 50m from the project site in the downwind direction. Use method specified by CPCB for analysis	Once	PMC
15.	Noise Monitoring	The equivalent noise levels shall be measured using an integrated noise level meter kept at a distance of 15m from edge of project site.	Once	PMC
16.	Solid waste management system	Records of waste collected and managed	Bi-annual	PMU (SMC)
17.	Number of orientation and training	Number of orientation and trainings conducted	Regular	PMU (SMC)
18.	Impact Audit	Compliance with EARF	Annual	PMU (SMC) through third party audit

EARF = Environmental Assessment and Review framework, DSC= Design Supervision Consultant, PMC = Project Management Consultant, SMC = School Management Committee

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

VI. PUBLIC CONSULTATION AND DISCLOSURE MECHANISM

51. 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 (refer **Annexure - 6**), 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.

VII. GRIEVANCE REDRESS MECHANISM

(i) Introduction

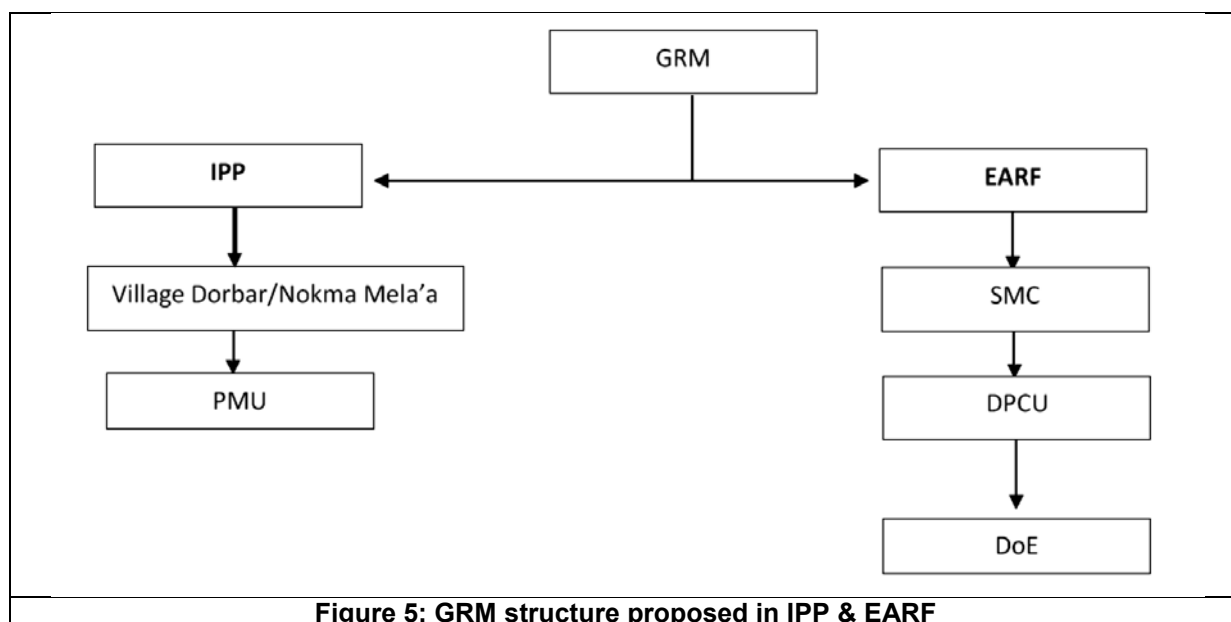
52. Asian Development Bank (ADB) requires that the borrower/client establish and maintain a grievance redress mechanism to receive and facilitate resolution of stakeholders concerns and grievances about the social and environmental performance at project level. It should address people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the community. The aim of Grievance Redress Mechanism (GRM) will be to provide a time-bound and transparent mechanism to voice and resolve complaints of the people in a sensitive manner.

(ii) Objectives of GRM

53. In order to provide an accessible mechanism to the affected people, community and any stakeholder(s) to raise their issues and grievances as well as concerns, a GRM will be established within the project ambit. The GRM shall be an officially recognized “non-judicial” process that will seek to resolve non-judicial disputes arising out of various matters related to the implementation of the environmental and social safeguards, as well as other aspects of the project, as may deemed fit to be raised. The fundamental objectives of GRM are to resolve any social and environmental related grievances locally in consultation with the aggrieved party to facilitate smooth implementation of the project. Another important objective is to democratize the development process at the local level and to establish accountability to the stakeholders. However, the options of legal recourse will not be restricted in any way by the project proponent.

(iii) Need for an updated GRM structure

54. The Indigenous Peoples Plan (IPP) and Environmental Assessment and Review Framework (EARF) reports prepared for the project has recommended for setting up of Grievance Redress Mechanism. However, the mechanism structure recommended in both the documents is different from each other. The recommended grievance redress mechanism in both the documents is depicted in **Figure 5**.



55. The structures proposed in the IPP and EARF reports have some or other limitations. In the case of IPP recommendation, the grievance from village level will come directly to PMU level, which is a very high-level body in the project context. Given that the Project Management Unit (PMU) is consisting of very senior level officials, it is not feasible for the PMU to meet frequently to dispose of grievances.

56. Moreover, the PMU is based in the state capital and people will find it difficult and expensive to travel to state capital for Redressal of grievances after it fails at village level.

57. The recommended structure of GRM in EARF is somewhat close to correct structure, but this also suffers from some limitations. Inclusion of School Management Committee (SMC) and Department of Education (DoE) as part of the GRM limits the usefulness of it in the project context. The mention of DoE in GRM structures shows that the structure has been proposed specifically to deal with the education sector, whereas, the project scope is much wider with the inclusion of skill sector in it. Furthermore, a Project Implementation Unit (PIU) in DoE has been created to handle the project and is represented in the project through the PIU. Therefore, the mention of DoE may not be appropriate from that stand point.

58. In view of these limitations and much wider scope of the project, it is therefore recommended to have a common GRM structure that covers all the sectors and duration of the project.

(iv) Approach to Establishing GRM

59. A common Grievance Redress Mechanism (GRM) for social and environmental complaints has been proposed to be in place for the project. Indigenous Peoples Plan (IPP) and Initial Environmental Examination (IEE) and/or Environmental Impact Assessment (EIA) related grievances will follow the GRM described below, which is developed culturally appropriate manner and in line with the ADB safeguard policy requirement.

60. The GRM will provide an accessible platform for receiving and facilitating resolution of affected persons' grievances related to the social and environmental issues of the project. This redress mechanism process can be extended to address other project related grievances. Grievances of affected person/group can be conveyed through personal visit, phone or email. The NGO (Aide-et-Action International - South Asia), as part of awareness campaign will also create awareness about the grievance redress mechanism, the process, timeframe for Redressal of grievance etc. The grievance redress procedure and the timeline to redress at respective level is depicted in **Figure 6. Annexure 7** shows the sample Grievance Registration Form and Action taken report.

(v) Scope of GRM

61. The GRM will:

- Consider only those grievances that has linkages to or bearing on the project
- Review, consider and resolve grievances related to social and environmental aspects of the project received by the different forums devised for GRM;
- Resolve grievances within a specified period set out in the document;
- Not engage in any review of the legal standing of an "awardee";
- Arrive at decisions through consensus as far as possible. Any decision made by the GRM must be within the purview of project framework and entitlements;
- Not deal with any matters pending in the court of law;

62. The DLF, PLF and PMU shall meet depending on number cases referred to it. However, any cases referred to these entities shall be heard within the time limit of referral stated above. The DLF meetings will be held in the District Magistrate/Deputy Commissioner Office of that particular district. The PLF meeting will be held in respective Project Implementation Unit office in Shillong and PMU meeting shall be held in State Secretariat in Shillong.

(vi) Tier of GRM

63. Given the traditional socio-cultural setup of the state and readily accessible to all segments of the community, it is suggested to have three levels of grievance redress mechanism for the project, viz. village level, district level and at PIU level. The aim of having different levels of

grievance redress mechanism is to provide a higher forum to the aggrieved person, if the same is not satisfied with the decision of lower level forum.

a. 1st Tier- Village Level Forum (VLF)

64. Historically, the major tribal groups (Khasis, Jaintias, and Garos) have had well-developed political systems of their own with wide ranging power and authority. The village headmen enjoy the support and trust of the villagers in dealing with certain administrative, social, religious and welfare functions within their jurisdictions. Keeping in view of existing traditional system that has been working efficiently for generations, it is therefore suggested to have the village headmen as the first tier of GRM proposed under this project. The composition of village level forum shall remain same as the traditional Dorbar Shnong, Elaka Durbar and Nokma Mela'a as the case may be. The village headmen can obtain the support of the Community Mobilizer (CM) of the project in redressing the grievances at their level, if required. The Community Mobilizer will provide the necessary guidance and help as and when requested by the headmen.

b. 2nd Tier - District Level Forum (DLF)

65. The next level of GRM would be at the district level. The institutional arrangement under the project has established District project Coordination Units (DPCU) at each district for coordination, monitoring and supervision of the project. The DPCUs are comprising of the Deputy Commissioner, District Planning Officer, District Education officers, District Employment Officer/ITI Principal, all Block Development Officers (BDOs) and Monitoring Officers. The district level grievance redress mechanism will consist of DPCU members.

c. 3rd Tier – Project Implementation Unit Level Forum (PLF)

66. The third level of GRM would be at the Project Implementation Unit (PIU) level. The project has already established four PIUs at the state head quarter. The PLF level grievance redress mechanism will consists of following members.

- Head Project Implementation Unit or her/his representative
- Safeguards officer - PIU
- Social safeguards Specialist - Project Management Consultant
- Environment Specialist – Project Management Consultant
- Team Leader of NGO (Aide-et-Action International - South Asia)

d. 4th Tier – Project management Unit (PMU)

67. The fourth and final level of GRM would be at the Project management Unit (PMU) level. The PMU has already been established at the state head quarter. The existing officials of the PMU shall constitute the members of grievance redress mechanism at this level.

(vii) Grievance Reporting Procedure

68. An aggrieved person, a group of persons or a community will be able to access the grievance redress mechanism without any fear and intimidation. The aggrieved party can approach the village headman or directly the Community Mobilizer for reporting of grievance. If the aggrieved person/group/community approaches the headman with the grievance, the village headmen in turn will get in touch with the Community Mobilizer and brief him on the grievance.

69. All the grievances reported to the Community Mobilizer directly or through village headman will be screened to determine whether the grievance comes under the project purview or not. If the grievance is outside the scope of project mandate, the same shall be communicated to the village headman or to the complainant by the Community Mobilizer. After the screening, if the grievance found to be falling within the project purview, the Community Mobilizer will register the grievance by filling the grievance registration form. The Community Mobilizer will try to resolve the grievance at his level with the help of headmen. If the grievance is unresolved at his level or the grievance needs Redressal at higher-up, the Community Mobilizer shall refer the grievance

to the district level forum. The timeline for VLF/Community Mobilizer to redress the grievance or come to conclusion of referring to DLF is one week from the date of reporting.

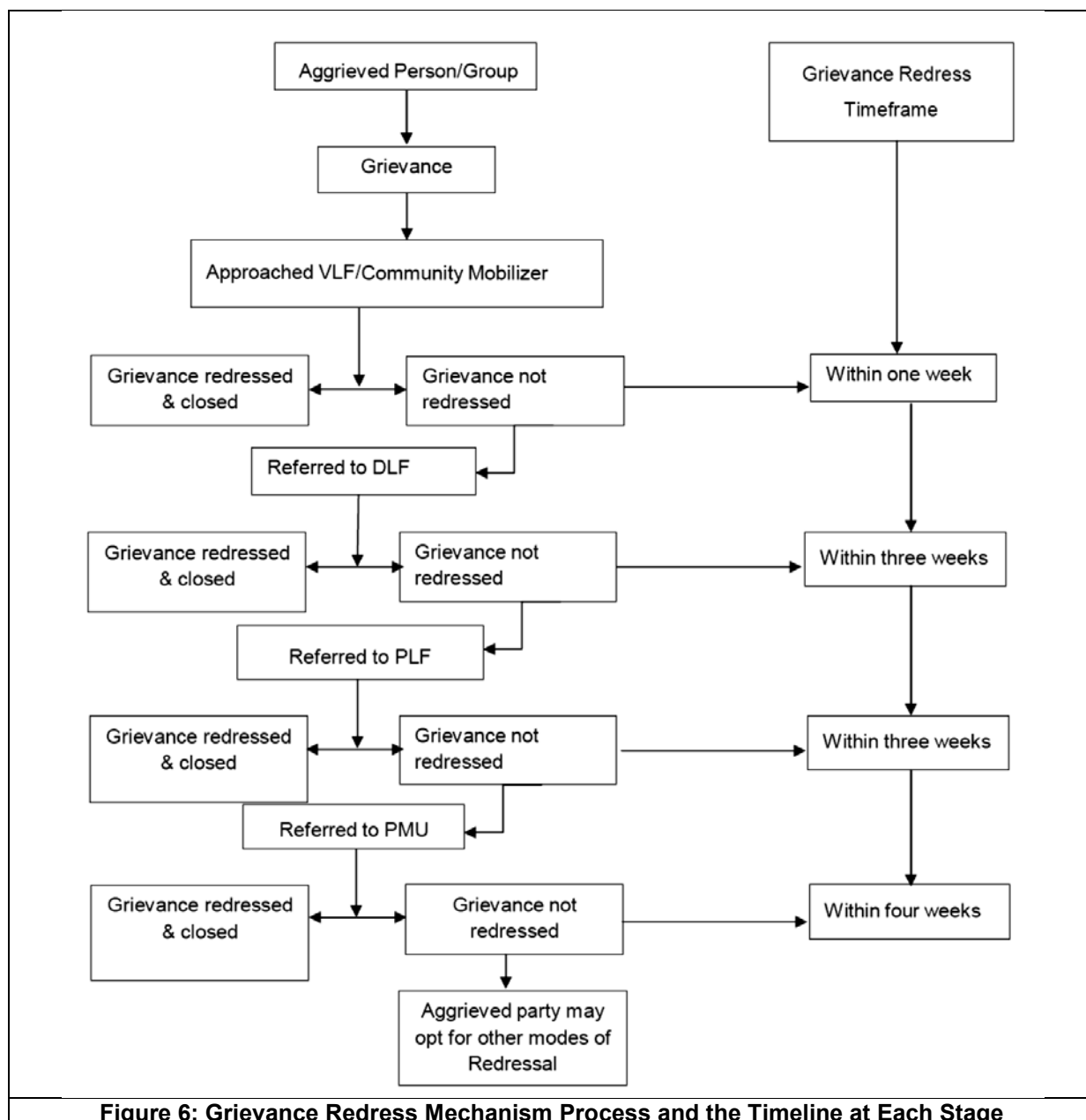


Figure 6: Grievance Redress Mechanism Process and the Timeline at Each Stage

70. All grievances referred to DLF must be submitted in writing with action taken report. The grievance reference letters etc. to DLF shall contain the filled in registration form, action taken report and any other relevant material that will help the DLF in resolving the issue. The complainant/s may be present personally or through appointed representative for hearing of grievance at district level forum on a date communicated to him by Community Mobilizer in advance. The decision made by DLF will be communicated to the concerned person/group/community in writing. The proceedings of DLF shall be maintained by the DPCU. The DLF will hear the grievance within three weeks of its referral. If dissatisfied, with the decision of the DLF, the person/group/community may request a further review of the same by the PLF. The DPCU will refer the grievance to the appropriate PIU for redress. The referral letters etc. shall be send to PLF with all the records of previous proceedings related to the grievance. The PLF will try to redress the grievance amicably within three weeks of its referral. If the grievance

remains unresolved at PLF level, the same shall be referred to the PMU for the hearing. The PMU will hear the matter within four weeks of grievance referral from the PLF.

71. In order to maintain the continuity of the grievance redress mechanism for the entire duration of the project life, the DPCU has to play a prominent role. In the beginning, the Community Mobilizer of the NGO will be the point to go person for grievance reporting. However, in the long-term the DPCU will take over from the Community Mobilizer as their withdrawal period come close. The DPCU members will work along with the Community Mobilizer until their deployment and will gradually take over from them for the continuity.

(viii) Disclosure of the Grievance Redress Mechanism

72. The true benefit of grievance redress mechanism can be accrued only if the process is widely known among the people of the state. Therefore, disclosure and wider publicity of grievance redress mechanism of the project will form an important part of the awareness campaign strategy devised in the project. The methods that will be adopted for disclosure of grievance redress mechanism are:

- The grievance redress mechanism process will be made part of the training programme of District Project Coordination Unit, Project Implementation Unit and Community Mobilizer engaged in the project.
- GRM procedures and operational rules will be publicized widely through community meetings and pamphlets in the local language so that people are aware of their rights and obligations, and procedure of grievance redress.
- As part of the community awareness exercise, the GRM process will be explained to the village level committee members and the people in general. Also, the process will be displayed at important places such as village Durbar/Nokma Mela'a Office, Block Development Office, District Magistrate Office and on the website.

(ix) Monitoring of GRM Process

73. Like the other project components, GRM process shall be monitored to ensure that the stakeholders are having no or limited issues with the project and in case there are concerns, they are being adequately addressed as per the mandate. The mechanism shall be integrated in the monitoring framework of the project and shall follow the same reporting timeline. Thus, this shall be aligned with project monitoring rather than doing it separately all the time. The format suggested for registering of grievances will form the basis of data collection and monitoring purpose.

VIII. ENVIRONMENTAL BUDGET

74. As part of good engineering practices in the project, there have been several measures as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subprojects. Therefore, these items of costs have not been included in the IEE budget. Only those items that are not covered under budget for construction are considered in the IEE budget.

75. This is a small construction project and it is not expected to cause much significant air, and noise pollution. However, as per the environmental monitoring plan routine environmental quality monitoring shall be conducted by the PMC/ Contractor. The costs of water sprinkling for dust suppression and providing personal protective equipment's to construction workers shall be borne by contractor as part of conditions of contract. The indicative EMP cost is given in the

76.

77. **Table 9.**

Table 9: Indicative EMP Budget

S.NO	DESCRIPTION OF ITEMS	QUANTITY	UNIT	Unit Rate		AMOUNT
				in Figure	in Words	
1	Safety Measures					
	Barricading of the construction site with chain link fencing as per specification to restrict entry of students and outsiders as a safety measures	140	Rm	870	Eight Hundred Seventy only	121,800.00
2	Dust Control Measures					
	Installation of HDPE construction scaffold safety net of impermeable materials to fully separate construction activities from school yards and buildings to prevent dust and other accompanying health hazards arising from air pollution and dust generation from construction materials, construction waste and debris etc	1442	Rm	50	Fifty Only	72,100.00
3	Labour Camp					
	Toilet for Labours: DRDO based Biodegradable Bio-digester FRP tank of 6 mm thickness, 2 cubic meter (2000 liters) capacity for 25-30 users per day including Anaerobic Microbium Inoculum (AMI) 600 liters in 200 liters container. FRP Toilet Cabin IWC type of size: 1250mm X 915mm X 1675mm with 5% tolerance.	1	Nos	115784	One Lac Fifteen Thousand Seven Hundred Eighty Four Only	115,784.00
(i)						
	Construction of Bathroom for Labour (One Bathroom + One Soak Pit)	1	Nos	66800	Sixty Six Thousand Eight Hundred Only	66,800.00
(ii)						
4	Tree Plantation					
	Supplying of locally available saplings of ornamental/fruit/broad leaf/conifer species according to site as per understanding with School Management Committee (SMC) and necessary planting and maintenance by SMC.	10	Nos	LS	Five Thousand Only	5,000.00
5	Environmental Monitoring					
(i)	Water Quality Monitoring - Ground and Surface Parameters: pH, Turbidity, Total Coliform, Faecal Coliform, Iron, Arsenic Frequency: Near subproject / site specific; (One ground water / One Surface water, (Minimum two samples at each subproject / site during various stage of	16	Nos	2470.00	Two Thousand Four Hundred Seventy only	39520.00

S.NO	DESCRIPTION OF ITEMS	QUANTITY	UNIT	Unit Rate		AMOUNT
				in Figure	in Words	
	construction) as applicable during pre-construction, construction and post construction stage.					
(ii)	Air Quality Monitoring Parameters: PM 2.5, PM10 Frequency: Twice a week @ 2 Locations upwind and down wind at each sub-project/site; during pre-construction, construction and post construction stage.	16	Nos	3800.00	Three Thousand Eight Hundred only	60800.00
(iii)	Noise Monitoring Parameters: Leq (Day), Leq (Night), Maximum Noise level Frequency: Once during pre-construction stage, once in a year during peak construction period and once during operation stage at each sub-project/site.	4	Nos	4,000.00	Four Thousand only	16,000.00
	Total					497,804.00
	Add Contingencies (@5 %)					522,694.00

IX. CONCLUSION AND RECOMMENDATION

78. The IEE carried out for the Babelapara Higher Secondary School up gradation project shows that the proposed interventions will result in net environmental benefits to the school and that any moderate environmental impact (drainage congestion/water logging, dust and noise pollution, occupational health hazards, risk from poor sanitation system, improper lighting and ventilation system in school, and management of labour at the site) anticipated during the project construction and operation shall be addressed through proper location, planning and design; control of construction activity and mitigation measures as suggested in the EMP. Appropriate barricading measures has been suggested for all the schools to prevent the students and staff entering the construction site.

79. The EMP provides mitigation for all identified impacts and the Contract clauses (annexure - 8) for the environmental provisions will be part of the civil works contract. Further, the proposed designs have been consulted with the stakeholders and no significant issues requiring redress in terms of environmental safeguards are known to exist at present.

80. Based on the findings of the IEE, it is evident that there are no significant impacts associated with the project activity. As per the ADB safeguard requirement, this project shall be categorised as Category "B". No further special study or detailed Environmental Impact Assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Annexure – 1

Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

IND: 46166-001: Supporting Human Capital Development in Meghalaya – Babelapara Higher Secondary School, Babelapara village, South West Garo Hills District

Sector Division:

Human and Social Development Division, SARD

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following areas:			Babelapara Higher Secondary School is located in Babelapara village of West Garo Hills District. The school in its vicinity does not have any protected/ ecological resources
▪ Underground utilities		✓	
▪ Cultural heritage site		✓	
▪ Protected Area		✓	
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	
• Bay			
B. Potential Environmental Impacts Will the Project cause...			
▪ Encroachment on historical/cultural areas?		✓	The proposed project interventions include construction of a new G+1 RCC building and retrofitting works that is proposed to be carried out for the existing school building at Babelapara Higher Secondary School which undergoes upgradation.
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	There are no protected area in the vicinity of the project area
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems?		✓	Does not arise
▪ Dislocation or involuntary resettlement of people?		✓	Land belongs to the school authority, hence involuntary resettlement are not envisaged

Screening Questions	Yes	No	Remarks
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Does not arise
▪ Accident risks associated with increased vehicular traffic, leading to loss of life?		✓	Does not arise
▪ Increased noise and air pollution resulting from increased traffic volume?		✓	Does not arise
▪ Occupational and community health and safety risks?	✓		During the project construction safety risk may arise. However, by adopting the proposed EMP, it shall be mitigated
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?		✓	Does not arise
▪ Generation of dust in sensitive areas during construction?		✓	There are no sensitive areas in the vicinity of the sub project area.
▪ Requirements for disposal of fill, excavation, and/or spoil materials?		✓	The proposed project interventions include construction of a new G+1 RCC building and retrofitting works for the existing school. Hence minimal disposal of spoil materials are anticipated.
▪ Noise and vibration due to blasting and other civil works?		✓	Does not arise
▪ Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?		✓	Does not arise
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?		✓	Does not arise
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	The proposed project interventions include construction of a new G+1 RCC building and retrofitting works; hence very minimal labourers will be employed during the project construction and it won't have any impact on the existing social infrastructure and services
▪ Social conflicts if workers from other regions or countries are hired?		✓	The proposed construction of a new G+1 RCC building and retrofitting works will require very minimal labourers and hence local labourers shall be employed to the extent possible.
▪ Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?		✓	Does not arise
▪ Risks to community health and safety caused by management and disposal of waste?		✓	Does not arise
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	Does not arise

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: IND: Supporting Human Capital Development in Meghalaya – Babelapara Higher Secondary School, Babelapara village, West Garo Hills District

Sector: Education

Sub sector: Technical and Vocational Education and Training

Division/Department: Human and Social Development Division, SARD

Screening Questions		Score	Remarks ³
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	The proposed project interventions include construction of a new G+1 RCC building and retrofitting works for the existing school Babelapara Higher Secondary School. Hence there are no climatic impacts anticipated
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	Does not arise
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	The construction materials used for this project shall not have any impact on the climate change
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	Does not arise
Performance of project outputs	Would weather/climate conditions and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Does not arise

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Low

Other Comments: The proposed project interventions include construction of a new G+1 RCC building and retrofitting works for the existing school buildings at Babelapara Higher Secondary School (BHSS). The retrofitting works includes up gradation of the existing infrastructure (like provision of water supply, building renovation works, repair works, provision of additional lights / fans, toilet facilities etc.). The new building shall have provision for a science lab, computer room, separate toilets for boys and girls and four classrooms. Hence the proposed construction activities do not have any impact on the climatic conditions.

Prepared by: The Department of Finance (DoF), Government of Meghalaya

³If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Annexure 1A: Environment Categorization

Date: _____

Project Data	
Country/Project No./Project Title : IND: 46166-001: Supporting Human Capital Development in Meghalaya	
Subproject title	Babelapara Higher Secondary School, Babelapara village, West Garo Hills District
Project Executing Agency	The Department of Finance (DoF), Government of Meghalaya
Project Implementing Agency	Public Works Department (Buildings), Government of Meghalaya
Modality	
<input checked="" type="checkbox"/> Project Loan	<input type="checkbox"/> Program Loan
<input type="checkbox"/> Sector Loan	<input type="checkbox"/> MFF
<input type="checkbox"/> Other financing modalities:	
<input type="checkbox"/> Financial Intermediary	<input type="checkbox"/> General Corporate Finance
<input type="checkbox"/> Emergency Assistance	<input type="checkbox"/> Grant
ENV Impact categorization <input checked="" type="checkbox"/> New <input type="checkbox"/> Recategorization — Previous Category <input type="checkbox"/>	
<input type="checkbox"/> Category A: Significant ENV impact	
<input checked="" type="checkbox"/> Category B: Non-significant ENV impact	
<input type="checkbox"/> Category C: No ENV impact	
Prepared by: the Department of Finance (DoF), Government of Meghalaya	
DSC Environment Specialist (Name, title, signature)	PMC Environment Specialist (Name, title, signature)
Date: 31/10/17 <i>Ad. Rahman</i>	Date: 31/10/2017 <i>Adhakar</i>
For Project Implementing Agency (Name, title, signature)	<i>L. D. Suchiang</i>
Date: 05.10.17	Chief Engineer PWD (B) Meghalaya, Shillong
For Project Executing Agency (Name, title, signature)	<i>Agar</i>
Date:	Deputy Project Director Supporting Human Capital Development in Meghalaya Finance Deptt. Govt. of Meghalaya

ADB SPS, 2009

I. Environmental Safeguards

1. **Objectives:** To ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process.
2. **Scope and Triggers:** Environmental safeguards are triggered if a project is likely to have potential environmental risks **and** impacts.
3. **Policy Principles:**
 - Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.
 - Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.
 - Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.
 - Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.
 - Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.
 - Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.
 - Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.
 - Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located

within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.

- Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.
- Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.
- Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

II. Involuntary Resettlement Safeguards

4. **Objectives:** To avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

5. **Scope and Triggers:** The involuntary resettlement safeguards covers physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers them whether such losses and involuntary restrictions are full or partial, permanent or temporary.

6. Policy Principles:

- Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks.
- Carry out meaningful consultations with affected persons, host communities, and concerned nongovernment organizations. Inform all displaced persons of their entitlements and resettlement options. Ensure their participation in planning, implementation, and monitoring and evaluation of resettlement programs. Pay particular attention to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land, and ensure their participation in consultations. Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns. Support the social and cultural institutions of displaced persons and their host population. Where involuntary resettlement impacts and risks are highly complex and sensitive,

compensation and resettlement decisions should be preceded by a social preparation phase.

- Improve, or at least restore, the livelihoods of all displaced persons through (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.
- Provide physically and economically displaced persons with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
- Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
- Develop procedures in a transparent, consistent, and equitable manner if land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status.
- Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of nonland assets.
- Prepare a resettlement plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.
- Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to affected persons and other stakeholders. Disclose the final resettlement plan and its updates to affected persons and other stakeholders.
- Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.
- Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation.
- Monitor and assess resettlement outcomes, their impacts on the standards of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Disclose monitoring reports

III. Indigenous Peoples Safeguards

7. **Objectives:** To design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

8. **Scope and Triggers:** The Indigenous Peoples safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, or culture of Indigenous Peoples or affects the territories or natural or cultural resources that Indigenous Peoples own, use, occupy, or claim as an ancestral domain or asset. The term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (i) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (ii) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; (iii) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and (iv) a distinct language, often different from the official language of the country or region. In considering these characteristics, national legislation, customary law, and any international conventions to which the country is a party will be taken into account. A group that has lost collective attachment to geographically distinct habitats.

9. **Policy Principles:**

- Screen early on to determine (i) whether Indigenous Peoples are present in, or have collective attachment to, the project area; and (ii) whether project impacts on Indigenous Peoples are likely.
- Undertake a culturally appropriate and gender-sensitive social impact assessment or use similar methods to assess potential project impacts, both positive and adverse, on Indigenous Peoples. Give full consideration to options the affected Indigenous Peoples prefer in relation to the provision of project benefits and the design of mitigation measures. Identify social and economic benefits for affected Indigenous Peoples that are culturally appropriate and gender and intergenerationally inclusive and develop measures to avoid, minimize, and/or mitigate adverse impacts on Indigenous Peoples.
- Undertake meaningful consultations with affected Indigenous Peoples communities and concerned Indigenous Peoples organizations to solicit their participation (i) in designing, implementing, and monitoring measures to avoid adverse impacts or, when avoidance is not possible, to minimize, mitigate, or compensate for such effects; and (ii) in tailoring project benefits for affected Indigenous Peoples communities in a culturally appropriate manner. To enhance Indigenous Peoples' active participation, projects affecting them will provide for culturally appropriate and gender inclusive capacity development. Establish a culturally appropriate and gender inclusive grievance mechanism to receive and facilitate resolution of the Indigenous Peoples' concerns.
- Ascertain the consent of affected Indigenous Peoples communities to the following project activities: (i) commercial development of the cultural resources and knowledge of Indigenous Peoples; (ii) physical displacement from traditional or customary lands; and (iii) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual uses that define the identity and community of Indigenous Peoples. For the purposes of policy application, the consent of affected Indigenous Peoples communities refers to a collective expression by the affected Indigenous Peoples communities, through individuals and/or their recognized representatives, of broad community support for such project activities. Broad community support may exist even if some individuals or groups object to the project activities.
- Avoid, to the maximum extent possible, any restricted access to and physical displacement from protected areas and natural resources. Where avoidance is not possible, ensure that the affected Indigenous Peoples communities participate in the design, implementation, and monitoring and evaluation of management arrangements for such areas and natural resources and that their benefits are equitably shared.
- Prepare an Indigenous Peoples plan (IPP) that is based on the social impact assessment with the assistance of qualified and experienced experts and that draw on indigenous knowledge and participation by the affected Indigenous Peoples communities. The IPP includes a framework for continued consultation with the affected Indigenous Peoples communities during project implementation; specifies measures to ensure that

Indigenous Peoples receive culturally appropriate benefits; identifies measures to avoid, minimize, mitigate, or compensate for any adverse project impacts; and includes culturally appropriate grievance procedures, monitoring and evaluation arrangements, and a budget and time-bound actions for implementing the planned measures.

- Disclose a draft IPP, including documentation of the consultation process and the results of the social impact assessment in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected Indigenous Peoples communities and other stakeholders. The final IPP and its updates will also be disclosed to the affected Indigenous Peoples communities and other stakeholders.
- Prepare an action plan for legal recognition of customary rights to lands and territories or ancestral domains when the project involves (i) activities that are contingent on establishing legally recognized rights to lands and territories that Indigenous Peoples have traditionally owned or customarily used or occupied, or (ii) involuntary acquisition of such lands.
- Monitor implementation of the IPP using qualified and experienced experts; adopt a participatory monitoring approach, wherever possible; and assess whether the IPP's objective and desired outcome have been achieved, taking into account the baseline conditions and the results of IPP monitoring. Disclose monitoring reports.

Indian Labour Law

1. Labour Law is the body of law that governs the employer-employee relationship, including individual employment contracts, the application of tort and contract doctrines, and a large group of statutory regulation on issues such as the right to organize and negotiate collective bargaining agreements, protection from discrimination, wages and hours, and health and safety.
2. The law relating to labour and employment in India is primarily known under the broad category of "Labour and Industrial Law". The relevance of the dignity of human labour and the need for protecting and safeguarding the interest of labour as human beings has been enshrined in Chapter-III (Articles 16, 19, 23 & 24) and Chapter IV (Articles 39, 41, 42, 43, 43A & 54) of the Constitution of India keeping in line with Fundamental Rights and Directive Principles of State Policy.
3. Factors responsible for shaping the Indian Labour legislation include:
 - a. The prevailing social and economic conditions
 - b. The views expressed by important nationalist leaders during the days of national freedom struggle
 - c. The provisions of the Constitution
 - d. The International Conventions and Recommendations.
 - e. Important human rights and the conventions and standards that have emerged from the United Nations.
 - f. The deliberations of the various Sessions of the Indian Labour Conference and the International Labour Conference.
 - g. Recommendations of the various National Committees and Commissions such as First National Commission on Labour (1969) under the Chairmanship of Justice Gajendragadkar, National Commission on Rural Labour (1991), Second National Commission on Labour (2002) under the Chairmanship of Shri Ravindra Varma etc.
 - h. Judicial pronouncements on labour related matters specifically pertaining to minimum wages bonded labour, child labour, contract labour etc.

Semi-Annual Environmental Monitoring Report Template

1.0 Introduction

- Overall project description and objectives
- Description of projects
- Environmental category of the projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project progress and status

Sl.	Project Name	Status of Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

2.0 Compliance Status with National/State/Local Statutory Environmental Requirements

No.	Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

3.0 Compliance Status with Environmental Loan Covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

4.0 Compliance Status with the Environmental Management and Monitoring Plan

- Provide the monitoring outcomes/ analysis as mentioned in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
 - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
 - If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
 - adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
 - Are their designated areas for concrete works, and refuelling;
 - Are their spill kits on site and if there are site procedure for handling emergencies;
 - Is there any chemical stored on site and what is the storage condition?
 - Is there any dewatering activities if yes, where is the water being discharged;

- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Annexure – 5

Monitoring Table Format

Name of Subproject :						
Location :				Date :		
Name of Person Monitoring :						
Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Implementation Status During the Reporting Time
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Annexure – 6

Public Consultations at Rongsakgre Secondary School

1. During the project preparation, consultations have been held by the DSC safeguards team with the School Management Committee, Teachers and Public on suggestions and issues pertaining to the implementation of the proposed subprojects. The key issues highlighted during the discussion include the project detail.
2. The main outcomes of the Public Consultations are as under:
 - a) They were aware about the project but detail information was not available with them.
 - b) They were happy to know about proposed infrastructure and informed that it will help the students and teachers with improved infrastructure.
 - c) They also envisaged increase in the enrolment and reduce dropout of students after the project.
 - d) The following are the main outcome of the discussions:
 - The public was informed that the school infrastructure is proposed for improvement as per RMSA guidelines and proposed infrastructure improvement includes civil works, electrical and PHE.
 - It was also informed that condition assessment of the existing buildings will be carried out and decision on renovation, retrofitting and necessary rearrangement of rooms will be taken after structural and economical analysis.
 - The public was brief that during construction environment aspect would be taken care by implementation EMP

The below table reflects the consultations done and issues discussed.

Table 1: Consultations during Preliminary and Detail Design at Rongsakgre Secondary School

Sl. No.	Date of Site Visit	Place of Site	Participants	Issues Discussed
1.	2 nd May 2015	Babelapara Higher Secondary School	DSC experts and Teaching Staffs	Consultation on the proposed project.
2.	23 th June 2016	Babelapara Higher Secondary School	DSC experts, Site Engineers and Workers	Consultation on new building construction and EMP implementation

PHOTOGRAPHS OF PUBLIC CONSULTATIONS



Consultation with Teaching Staffs



Consultation with Workers



Consultation with Site Engineers & Staffs

Supporting Human Capital Development in Meghalaya



Name of School/ ITI/ TTC/

DIET:

District

Block

Venue

Meeting Title

Balsapur Grah. Hr. Sec. School

Date : 2/5/2015

Time : 11:00 AM

Bahupura Girls H. Sec. School.

Consultation on the detail of proposed project

S. N.	Name	M/F	Designation	Contact No.	Signature
1	Lohit Kanate	M	HR	8731855855	[Signature]
2	Neel G. Pande	F	AT	8414804353	Neel
3	Marbilla K. He	F	AT	8774477009	[Signature]



Annexure – 7

Sample Grievance Redress Form

Reference No.			Date		
Aggrieved party	Individual	Group	Community	Organization	
Full Name/ description in case of group/ Community/ Organization					
Address					
Phone no. / Mobile no.					
Description of Grievance (add page if space is not sufficient)					
Date, time & venue of village level meeting					
Description of Village level Forum decision (add page if space is insufficient): -					
Date, time & venue of DLF meeting (if required)					
Description of PIU level Forum decision (add page if space is insufficient): -					
Whether the complaint get resolved (Y/N)					
If No, whether it has been sent to next higher tier (Y/N)					
Signature/thumb impression of complainant			Signature of Community Mobilizer		

EMP Contract Clauses

1.0 GENERAL

1.1 The Contractor shall be responsible for implementation of environmental provisions outlined in the EMP, in addition to adhering to all environmental provisions in the applicable specifications for the works will be adhered to as part of good engineering practices.

1.2 All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise specified explicitly. The costs towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of the BoQ of the project. The scope of works of the contractor towards the implementation of the environmental provisions shall be as follows:

- Abide by all existing environmental regulations and requirements of the Government of India and State Government of Meghalaya, during implementation,
- Compliance with all mitigation measures and monitoring requirements set out in the Environmental Management Plan (EMP)
- Submission of a method statement detailing how the EMP will be complied with. This shall include methods and schedule of monitoring.
- Monitoring of project environmental performance and periodic submission of monitoring reports.
- Compliance with all measures required for construction activities in sensitive areas (if any), including protected areas, in line with the regulatory requirements adopted by MoEF, GoI.
- Compliance of all safety rules at work, and provision of adequate health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities.

1.3 The detailed provisions for specific environmental issues are outlined in the EMP table. Key clauses are outlined in the following sections.

2.0 QUARRY AND BORROWING

2.1 The Contractor will identify and seek prior approval of the Engineer for quarrying and borrowing operations. Quarry and borrowing will be carried only from locations approved by the Engineer. Quarrying, if required in the project will be only from approved quarries and no new quarries will be opened for the purpose of the project. Any deviation from the provisions will be immediately notified and approval of the Engineer is to be sought.

2.2 The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas so as to assure the stability and safety of the works and that any adjacent feature is not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion. Stockpiling of materials (topsoil, fill material, gravel, aggregates, and other construction materials) shall not be allowed during rainy season unless covered by a suitable material. Storage on private property will be allowed if written permission is obtained from the owner or authorized lessee.

2.3 Borrow areas and quarries shall be sited, worked, and restored in accordance with the specifications. Spoils shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements.

2.4 Following excavation for the works, the Contractor shall take all steps necessary to complete drainage and slope protection works in advance of each mining season. Erosion or instability or sediment deposition arising from operations not in accordance with specifications shall be made good immediately by the Contractor at the Contractor's expense. The Contractor shall take all steps necessary to complete drainage in advance of each rainy season in the areas excavated for borrow materials.

3.0 PRECAUTIONS FOR PROTECTION OF ENVIRONMENTAL RESOURCES

3.1 The Contractor shall ensure that construction activities do not result in any contamination of land or water by polluting substances.

3.2 Unless otherwise provided in the specifications, the Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except those required to be cleared for execution of the works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer.

3.3 The Contractor shall not use or permit the use of wood as a fuel for the execution of any part of the works and to the extent practicable, shall ensure that fuels other than wood are used for cooking and heating in all camps and living accommodations. Any wood so used must be harvested legally, and the Contractor shall provide the Engineer with copies of the relevant permits, if required.

3.4 The Contractor shall take all precautions necessary to ensure that vegetation existing adjacent to the project site is not affected by fires arising from the execution of the contract. Should a fire occur in the natural vegetation or plantation adjacent to the project site for any reason, the Contractor shall immediately suppress it. Areas of forest, shrub, or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or labourers shall be replanted or otherwise restored.

3.5 The Contractor shall confine operations to the dry season, use silt traps and dispose spoils in locations approved by the Engineer that will not promote instability and result in destruction of property, vegetation, irrigation and water supply. Disposal near wetlands, protected areas, and other areas that will cause inconvenience or deprive local residents of their livelihood shall not be allowed. Acidic and saline spoils shall not be spread into agricultural land.

3.6 The Contractor shall consult with local residents and local government before locating project offices, sheds, and construction plant. The work camps shall not be located near settlements, near drinking water supply intakes, protected areas, or wildlife habitats.

3.7 The Contractor shall maintain ecological balance by preventing felling of trees, water pollution and defacing of natural landscape. The Contractor shall, so conduct his cleaning operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of the archaeological site. In respect of ecological balance, the Contractor shall observe the following instructions.

3.8 In the conduct of cleaning activities and operation of equipment, the Contractor shall utilize such practicable methods and devices as reasonably available to control, prevent and otherwise minimize water, air, noise pollution.

4.0 WATER POLLUTION

4.1 The Contractor shall take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. Contractor shall avoid construction works close to the streams or water bodies during monsoon.

4.2 The Contractor shall monitor the water quality parameters periodically as specified in the monitoring plan and report to the Engineer

4.3 All waste arising from the project are to be disposed off in the manner that is acceptable to the State Pollution Control Board. The Engineer shall certify that all liquid wastes disposed off from the sites meet the discharge standards.

5.0 NOISE AND AIR POLLUTION

5.1 All works shall be carried out without unreasonable noise and air pollution. Subject and without prejudice to any other provision of the Contract and the law of the land and its obligation as applicable, the Contractor shall take all precautions outlined in the EMP to avoid the air and noise pollution.

5.2 The Contractor shall monitor the noise and air quality parameters periodically as specified in the monitoring plan and report to the Engineer.

5.3 The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

6.0 OCCUPATIONAL HEALTH AND SAFETY DURING CONSTRUCTION

6.1 The Contractor shall, in accordance with the safety and health provisions specified in the EMP, provide workers with a safe and healthy working environment, in the work areas, through

application of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. The borrower/client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by

- (i) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances;
- (ii) providing appropriate equipment to minimize risks and requiring and enforcing its use;
- (iii) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment;
- (iv) documenting and reporting occupational accidents, diseases, and incidents; and
- (v) having emergency prevention, preparedness, and response arrangements in place.

7.0 POST CONSTRUCTION CLEARANCE

7.1 On completion of work, wherever applicable, the Contractor shall clear away and remove from the sites all constructional plant, surplus materials, rubbish, scaffoldings and temporary works of every kind and leave the whole of the site and works in a clean condition to the satisfaction of the Engineer.

7.2 Construction camp sites post construction shall be cleared as specified in the EMP and handed over to the Owner. It will be ensured by the contractor that the site handed over is in line with the conditions of temporary acquisition signed by both parties.

Annexure – 9

SEISMIC VULNERABILITY ASSESSMENT OF SCHOOLS BASED ON QUESTIONNAIRE SURVEY

“Supporting Human Capital Development in Meghalaya”

Supported by Asian Development Bank

SEISMIC VULNERABILITY ASSESSMENT OF SCHOOLS BASED ON QUESTIONNAIRE SURVEY

Structural Characteristics:									
Block No.:	<input type="text" value="1"/>								
Building Type:	Confined Masonry Building	<input checked="" type="checkbox"/>					Reinforced Concrete Building	<input type="checkbox"/>	
	Assam Type	<input type="checkbox"/>					Unconfined Masonry Building	<input type="checkbox"/>	
Interstory height:	<input type="text"/>								
No. of cores:	<input type="text"/>								
Plan shape:	Rectangular	<input type="checkbox"/>	L Shape	<input type="checkbox"/>	U Shape	<input checked="" type="checkbox"/>	T Shape	<input type="checkbox"/>	
Length L:	<input type="text" value="43.21"/> m								
Width W:	<input type="text" value="18"/> m								
Slab thickness:	<input type="text"/> mm								
No. of staircase:	<input type="text"/>								
Width of staircase:	<input type="text"/>								
No. of doors:	<input type="text" value="22"/>								
Width of doors:	<input type="text" value="1"/> m								
Size of Post:	<input type="text"/> mm								
Size of Beam:	<input type="text"/>								
Projected reinforcement Detail:	<input type="text"/>								
Differential settlement:	<input type="text"/>								
Topography:	Hill top	<input checked="" type="checkbox"/>	Hill side	<input type="checkbox"/>	Steep slope	<input type="checkbox"/>	Mild slope	<input type="checkbox"/>	
	Mild slope	<input type="checkbox"/>	Plain	<input type="checkbox"/>	Low Land	<input type="checkbox"/>	Close to river	<input type="checkbox"/>	
	Other (specify)	<input type="text"/>							
Present condition of building:	Good (new)	<input type="checkbox"/>	Recently renovated	<input type="checkbox"/>					
	Need of Renovation	<input checked="" type="checkbox"/>	Bad (decayed)	<input type="checkbox"/>					
Age (in years):	< 10	<input type="checkbox"/>	10-20	<input type="checkbox"/>	20-40	<input type="checkbox"/>	> 40	<input type="checkbox"/>	
Year of construction:	<input type="text"/>								
Remarks:	<input type="text"/>								

Structural Details	YES	NO	NA
Structural Vulnerability			
Is the building irregular in plan?		✓	
Are the columns regularly distributed?	✓		
Are both building directions adequately braced (RC frames/shear walls, masonry walls)?	✓		
Does the ratio between the building's length and width is > 2.5 ?		✓	
Does the building possess eccentric cores (staircases or elevators)?		✓	
Does the building have a soft storey?		✓	
Is the building irregular in elevation caused by setbacks of upper stories?		✓	
Does the building have cantilevering upper stories?		✓	
Does the building have gable wall?			
Does the building possess a heavy mass at the top or at roof level?		✓	
Are pounding effects possible?		✓	
Does the building have short columns?		✓	
Are strong beams-weak columns available?		✓	
Does the building possess shear walls ?		✓	
Did the building suffer any significant structural damage in the past?		✓	
Does the building possess seismic retrofitting or strengthening measures?		✓	
Are there any significant amount of cracks/deformation in walls?		✓	
Are there any significant amount of cracks/deformation in columns?		✓	
Are there any significant amount of cracks/deformation in beams?		✓	
Are there any significant amount of cracks/deformation in slab?		✓	
Are there any significant amount of cracks/deformation in joints?		✓	
Is the building periodically painted?		✓	
Spalling of concrete observed in beams?		✓	
Spalling of concrete observed in column?		✓	
Spalling of concrete observed in slab?		✓	
Spalling of concrete observed in wall?	✓		
Spalling of concrete observed in other location?	✓		
Does the reinforcement bars suffer severe corrosion?		✓	
Growth of algae/vegetation observed in and around the structure?		✓	
Does the building have any fire safety device installed?		✓	
Does the building have flat roof?		✓	
Does the building have two way sloped roof?			
Does the building have four way sloped roof?			
Non-Structural Vulnerability Index			
I. Fire Fighting			
Are there smoke detectors and alarms available?		✓	
Are there enough fire extinguishers and hose-reel cabinets available?		✓	
Are they easily accessible? (if Q2 = NO → NA)			✓
II. Non-structural Infill Walls and Partitions			
Are (infill) brick walls protected against out-of-plane failure by e.g. internal reinforcement or surface meshes?		✓	
Do movement joints between brick infill walls and RC frames exist to allow damage-free movement? (for masonry → NA)			✓
IV. Ceilings			
Are suspended ceilings available?	✓		
Are the suspended ceilings adequately secured against failure? (if Q9 = NO → NA)		✓	
V. Emergency Exits and Escape Routes			
If exit fire doors jam in an earthquake, is there a crowbar or sledge hammer readily available to facilitate emergency opening?		✓	
Do all exit doors open outwards?	✓		
Are all doors unlocked from the inside and also unblocked?	✓		
Are the windows of ground floor barred/trellised?		✓	
Are glazed windows available?		✓	
Has the glazing of windows been designed to accommodate lateral movement? (if Q15 = NO → NA)			✓
Do large windows, door transoms and skylights have safety glass? (if Q15 = NO → NA)			✓
Are emergency exits and escape routes adequately designated, e.g. by fluorescent signs?		✓	
Are emergency exits and escape routes adequately illuminated?		✓	

VI. Appendages			
Can nonstructural elements (e.g. parapets, facade cladding, roof tiles, chimneys) fall from the building and harm children or teachers running outside?		✓	
VII. Movable Equipment			
Are wardrobes/lockers/bookshelves/blackboards adequately anchored to the walls?		✓	
Are tables stable enough to protect children from falling objects (e.g. suspended ceilings)?		✓	
VIII. Appurtenant structures			
Are enough open spaces around the building to be used as escape routes and where people are safe from falling objects?		✓	
Can neighboring structures (also walls, electricity lines) block escape routes or harm people running/gathering outside?		✓	
Can road access to and from the school be blocked due to collapse of buildings or geotechnical effects (landslides etc.)?		✓	
IX. FLOOD VULNERABILITY ASSESSMENT:			
Is the school situated near a river, pond, lake or any other water bodies?		✓	
Has the school affected by past flood event?		✓	
Are heavy debris flow and sediment deposits expected?		✓	
How quickly the flood water enters and leaves the site?		✓	
Is the school protected by any flood retention structures like embankments, flood walls etc.?		✓	