MIZORAM STATE ROADS - II PROJECT
GROUP – 1

PUBLIC WORKS DEPARTMENT

EXECUTIVE SUMMARY OF ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF)

IN ENGLISH VERSION

February 2014

STUP CONSULTANTS PVT LTD.

Executive Summary

1. Background

The Government of India has requested World Bank for financing rehabilitation, widening and strengthening of State Highways and District Roads which are managed by Public Works Department (PWD) in the State of Mizoram. The proposed improvements are expected to enhance the quality of service level. In line with this request, Mizoram State Roads Project – II is proposed.

Considering the proposed implementation of different corridors under the project, it is felt necessary to upfront define an Environmental Management Framework (EMF) which will: (i) guide the process of preparation of corridor level EA/EMPs as well as institutional structure for better overall environmental management at project level in addition to corridor level specific EMP implementation; and (ii) add to institutional capacity of PWD in streamlining the environmental management aspects within PWD for construction and management of any future road projects. The principles of EMF are based on the regulatory requirements of Government of India and Mizoram, and World Bank Safeguards. The EMF provides the overall framework in the form of a methodology to carry out Environmental Assessment and guidance in to minimize and mitigate negative impacts of the proposed project, preparation of Corridor specific Environmental Management Plans (EMP), and Generic EMPs

2. Project Objective

The Mizoram State Roads Project II (MSRP-II) key objective is to improve existing road connectivity through rehabilitation, strengthening and widening efforts. Such an effort would also lead to incidental benefits of improving the quality of existing connectivity to Bangladesh and Myanmar. The project also envisages enhancing the institutional capacity building of PWD for road construction and maintenance.

As part of the project preparation, about 157 km of existing road length, under Group 1 will be strengthened and upgraded, as they are already designed; and as part of project implementation, design additional 284 km of existing roads under Group 2 for upgradation. The proposed road corridors under Group I and II are given in the table below:

Proposed Project Roads under MSRP II Project

Group -1	**District(s)**	**Length**
i. Lunglei - Tlabung - Kawrpuichhuah	Lunglei	87.9 km, (E-W corridor)
ii. Champhai – Zokhawthar	Champhai	27.5 km, (E-W corridor)
iii. Chhumkhum-Chawngte	Lunglei	41.7 km, (N-S corridor)
Group - 2		
i. Junction NH44A (Origination) Chungtlang – Darlung – Buarpui	Mamit & Lunglei	83 km
ii. Buarpui – Thenlum – Zawlpui	Lunglei	95 km
iii. Chawngte to BungtlangSouth up to Multimodal Road junction	Lawngtlai	76 km
iv. Zawlpui – Phairuangkai	Lunglei	30 km

3. Benefits of the project

Given that the road infrastructure is the only mode transport in the state, the MSRP-II is expected to improve basic access in a remote, hilly, and mountainous region. This will facilitate enabling environment for development and growth by reducing freight and passenger transport costs and providing quicker and safer accessibility. Improvements in road access, capacity, quality, and safety would foster: (a) increased economic and social development; (b) better access to health and education services for a large portion of the State's population; (c) lower cost for goods and services within the State; and (d) improved market access for agriculture-based products. The Project is also expected to result in more effective management of State road assets, which should lead to improved value-for-money for Government of India's (GoI's) and Government of Mizoram's (GoM's) spending on road infrastructure. The roads built and improved under the Project will also provide public amenities such as covered bus shelters and toilets. Usable land will be reclaimed by the controlled and/or safe disposal of excavated materials. Abandoned worker and contractor camp sites and water harvesting structures will be given to the communities for their use after implementation.

The Environmental benefits to be generated by the Project are: (a) improved roads; (b) improved drainage; (c) reduced landslides and soil erosion; (d) increased road safety; (e) recycling of debris and surplus excavated material to create new sites for development and prevent the negative impacts of indiscriminate dumping; (f) afforestation (10 native trees will be planted for each tree lost), enhancing degraded forests; and (g) introduction of "environment sensitized" construction management and machinery and landscaping of the Project's surrounding areas, thus improving the aesthetics.

4. Potential Environmental Impacts

While the project is expected to have significant benefits, potential environmental impacts cannot be ruled out. Unless the project factors necessary measures to minimize and mitigate the potential environmental impacts during construction and post construction phases, the benefits of the project many not lead to sustainable benefits. The nature of potential environmental impacts of the project would include:

(a) Stability of Slopes

The hill road strengthening and widening would involve hill cutting which is expected to affect stability of natural slopes and if unattended could lead to landslides. In case of Mizoram, parts of the hill ranges are weak and vulnerable geological formations. Such areas could be prone to serious impacts including loss of livelihood, safety hazard, blocking of drainage pattern, disruption of traffic and damages to native species of natural flora. Thus, balancing cut and fill as far as possible, and slope protection need to be integrated in to the corridor level designs.

(b) Disposal of Construction Debris

Earthwork along almost the entire up-gradation of project roads will be carried out mostly by cutting on the hillside. Some of the spoil (not more than10 to 15%) will be utilized and remaining spoil will be disposed in designated disposal sites which will

create- Loss of land as disposal sites, Loss of agriculture land, change in land use pattern Loss of biodiversity and block the drainage channels. Given this, the debris need to be put to productive use, which can include: creation of flat in designated community lands, disposal in protected sites with adequate erosion control measures, etc.

(c) **Disruption to Natural Drainage System**

Construction of roads in the region may modify the overland (surface) flow patterns causing no flow or reduced flow in some natural channels and high/concentrated flow in the others. Such alterations in drainage patterns could affect the community water sources as well stability of slopes. Hence drainage aspects require effective integration in technical designs of the corridor level plans

(d) Impacts on Biodiversity

The proposed rod widening activities in these areas could affect the biodiversity in terms of: clearing of land in biodiversity rich areas and/or impacts during construction phase, although land diversion would be limited.

(e) Effects on Water source and water Quality

If the construction activities are not controlled with relevant construction management measures, there would be potential impacts relating to pollution of water sources. Such impacts could arise from activities relating to cutting and filling, disposal of construction waste and spoil, erosion and soil movement due to road construction activities like quarrying and borrowing, etc.

(f) Water for Construction - Storage and Harvesting

Water scarcity in Mizoram during the non-monsoon months is a result of the topography as well as the poor water retention capacity of the soil. Contractor will face serious water scarcity problem which will also affect the local people.

(g) Safety issues associated with road construction

Construction of project roads involves occupational health and safety risks. Accidents may occur during the construction and operation of roads, operation of quarries which will also lead to injuries or loss of property and life.

(h) Cultural and Historical Areas

Cultural and historic sites in the form of grave yards and memorial stones may be threatened by road construction and associated works. It can destroy the sites or alter their character.

(i) Change in land use pattern

The proposed project requires acquisition of Jhum cultivation and limited area of forest spread over different corridors . This agriculture and forest land will change its land use pattern to a limited extent. These changes could impact the socio-economic pattern affecting the livelihood. However, if addressed appropriately through slope protection measures by native terracing methods, the loss of livelihood could be restored considerably. Further in terms of land use, there may not be significant impact except the

current Ribbon development all along the road corridors would firm up with the improved road facility.

5. Environment Management Plan

Appropriate mitigation measures suitable to the anticipated impacts of MSPR-2 is suggested as-

Environmental issues /category	Mitigation Measures
Slope stability	All areas of cutting shall be covered with vegetation. Bioengineering techniques as appropriate shall be undertaken at all vulnerable locations. A combination of bio-engineering techniques and hard engineering solutions at locations vulnerable to landslides shall be provided, based on the suitability at site.
Disposal of excavated soil	The disposal of debris shall be carried out only at sites identified for the purpose. (Refer annexure 2&3) All slopes of the site shall be covered with vegetation. A combination of bio-engineering techniques and hard engineering solutions shall be as toe walls, shall be provided Bioengineering techniques as appropriate shall be undertaken at all vulnerable locations.(Refer annexure-4)
Blasting of rocks	Only control Blasting shall be carried out. Environment Health safety guidelines should be implemented.
Loss of forest land	Compensatory forestation as per GOI rule and as per direction of Forest Department GOM, issued during forest clearance. Introduction of exotic species will be prevented in the roadside plantation for such stretches.
Loss of agriculture land	Fencing shall be erected to delineate the agriculture land from further damage during construction. Drains will be provided in the area to prevent entry of contaminated run-off during the construction phase. Law enforcement to protect the agriculture land
Extraction of stone from Quarry	The Contractor shall obtain materials from quarries only after consent of the Department of mining or other concerned authorities and only after development of a comprehensive quarry' development plan and licensed by the SPCB.
Water management	While working across or close to the Rivers, the Contractor shall not prevent the flow of water. Contractor to serve notice on the downstream users of water sufficiently in advance. Construction over and close to the non-perennial streams shall be undertaken in the dry session.
Impact on Cultural and historical areas	Structures if impacted are to be shifted in suitable location in consultation with local people.
Stone crushing & asphalt plants	Use water sprinkler to suppress dust Plants re-sited or compensation arranged if pollution is caused. Large earth bunds constructed and vegetated to reduce hazard.
Camp operation	Checks to ensure that camps are not polluting neighboring areas, especially from sewerage and rubbish disposal Gas / Kerosene stoves and gas / kerosene provided to laborers.

Environmental issues /category	Mitigation Measures
	Checks to ensure camp areas are fully restored, including re-top soiling and tree planting if appropriate.
Hazardous materials	Check to ensure that storage is good and that there are no losses or leaks. Checks to ensure that protective clothing and safety measures are used.
Dust and Noise	Speed controlled using speed bumps. If water is available, the road surface can be sprayed on a frequent schedule Permanent speed bumps installed in villages and bazaars to reduce traffic speeds in inhabited areas. Bitumen surface constructed in bazaars, with speed controls. Dense vegetation planted on roadside.

The guideline attached with the report in the form of Annexures 1 to 19 will be applicable to this project

4.0 Regulatory framework

Key Applicable National and State Laws and Regulation

The following laws are applicable in this project –

Table -1 Summary of Environmental Legislation Applicable to the Proposed Project

• Environment (Protection) Act. 1986 • Notification on Environment Impact Assessment of Development projects (and amendments) 2006 ,2009,2010,2013 • Wildlife Protection Act 1972 • Water (Prevention and Control of Pollution) Act (and subsequent amendments)1974 • Air (Prevention and Control of Pollution) Act (and subsequent amendments)1981 • Forest (Conservation) Act,1980 • Central Motor Vehicle Act 1988and • Central Motor Vehicle Rules1989 • Ancient Monuments and Archaeological Sites and Remains Act 1958 • The Land Acquisition Act 1894 & 1989 • Noise Pollution (Regulation and Control) rules 2000/2001 • Ramsar Convention on Wetlands of International Importance1971 • Assam Forest Regulation of 1891. • The Mizoram (Forest) Act, 1955 (as passed by Mizo District Council). • The Pawi Autonomous District Council (Forests) Act, 1979. • The Lakher Autonomous District Council (Forests) Act, 1981. • The Chakma Autonomous District Council (Forests) Act, 1992. • Mizoram Wildlife (Protection) Rules, 1990. • Mizoram Minor Minerals Concession Rules 2000
Construction stage
• Air (Prevention and Control of Pollution) Act, 1981 and Noise Pollution (Regulation and Control) Rules, 2000
• Hazardous Waste (Management and Handling) Rules, 1989 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989
• Environment Protection Act, 1986 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989
• Environment Protection Act, 1986
• Water (Prevention and Control of Pollution) Act, 1974
• Environment Protection Act, 1986
• Environment Protection Act, 1986
• Hazardous Waste (Management and Handling) Rules, 1989

Labour related Laws -
• Workmen's Compensation Act 1923
• Contract Labour (Regulation and Abolition) Act, 1970
• Minimum Wages Act, 1948
• Payment of Wages Act, 1936
• Equal Remuneration Act, 1979
• Child Labour (Prohibition and Regulation) Act, 1986
• Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979
• The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996
• The Factories Act, 1948
• Hazardous Wastes (Management and Handling) Rules, 1989Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

World Bank Policies: Applicable Safeguards Policies of the World Bank for this project are-

World Bank Policy	**Triggered or Not Triggered**
Environmental Assessment OP 4.01	Triggered
Natural Habitats OP 4.04	Triggered
Forestry OP 4.36	Triggered
Physical Cultural Resources (OP 4.11)	Triggered

Due to difficult terrain and sensitive habitat issues, the Mizoram II Project is a Category A for environmental and social safeguards aspects, thus requiring an Environmental Assessment (EA), Environmental Management Plan (EMP), and Resettlement and Indigenous People's Development Plan (RIPDP).

5.0 Need for Environment Management Framework

Although the general thrust and broad project interventions are well understood, the specific details about multiple sub-projects located across various parts of the state. Potential impacts of group-1 roads have been assessed but nature of the group-2 and other roads are not known. Thereby the nature and scale of their potential impacts will be known only later. In such a situation, where sub-projects traversing multiple districts are located different parts of the state with almost similar geographical, topographical and socio-economic conditions, potential impacts will also be similar. Need was felt to prepare a document that will 'guide' the planning, design and construction elements of sub-projects and help in harmonizing the principles/approaches for project preparation and execution. In this context, an Environment Management Framework has been prepared for the project.

Environment management approach and tools

A comprehensive environmental management approach for the project will involve the following key steps and processes:

1. Preliminary Environmental Screening
2. Catgorisation of the project (category A /B as per WB requirement)
3. Environmental screening and Catgorisation of the project (category A /B as per GOI requirement)
4. **Scoping**: identify significant potential impacts and project alternatives, and propose Terms of Reference TOR for the EIA
5. **Baseline Data Collection**: identifies current and future environmental and conditions without the project.
6. **Predict Environmental Impacts**: assess impacts in terms of characteristics such as magnitude, extent and duration in quantitative terms as far as possible; describe all reasonable alternatives, including preferred and 'no action' options.
7. **Design Mitigation Measures**: to avoid, reduce and minimize adverse environmental impacts and enhance beneficial impacts.
8. **Public Consultation and Participation**: occurs at various stages in the assessment process to ensure quality, comprehensiveness and effectiveness, and that stakeholders' views are adequately addressed.
9. **Prepare EIA Report:** summarizes all information obtained, analyzed and interpreted in a report form; should contain a non-technical summary including methods used, results, interpretations and conclusions.
10. **Review and Approval of EIA Report**: reviews report to assess if all possible issues have been adequately addressed and to facilitate the decision-making process; decide if project should proceed, or if further alternatives must be examined.
11. **Prepare Environmental Management Action Plan (EMP)**: determines specific actions to take during engineering design and construction stages to minimize or mitigate impacts. Prepare Resettlement Action Plan and/or Vulnerable Communities Development Plan, if required.
12. **Environmental and Social Monitoring**: determines compliance with EMP
13. **Cumulative Environmental Assessment report -** During implementation of the project
14. **Environmental Audit**: conducted two years after project completion

6.0 Stakeholder consultations

Stages of consultations

PIU with guidance and assistance from the consultant and World Bank will facilitate (public and focused group) consultations/workshop plan for each project road that covers the following key stages:

- Preliminary consultative session at the very early stages of the project design when the first set of engineering designs are developed
- Second round of consultations on the engineering design once recommendations from the first consultations have been considered in revised designs taking into considerations concerns about bypasses, realignments, land acquisitions, forest diversions, tribal forest land concerns
- During preparation of TORs for draft EIA
- Public consultations on the draft EIAs with the respective SPCB (where an Environmental Clearance is required)
- Once the final EIA are cleared for official release into the public domain

Out com of consultation

Over-all, the consultations would:

- Learn about the community needs and preferences with respect to the project objective to improve connectivity through widening and rehabilitating project roads
- Identify and agree on alignment options that have relatively lesser impact on affected people
- Discuss the environmental and social safeguard implications/impacts that might be associated with the suggested alignment or bypass options, along with the impact mitigation guidelines and measures adopted in the EMF

- Discuss compensatory afforestation plans
- Have the community identify grievance and redress mechanisms for resolving project design and implementation concerns
- Determine the main pillars of a communication/consultation strategy that will be adopted throughout the project phases
- Determine options for engaging local community and NGOs in the operation

7.0 Institutional arrangements and capacity development

Capacity Assessment

In the past project and in other donor funded/ADB project – ad hoc consultant support provided during implementation, civil engineers assigned from PWD to cover environmental aspects. There is no dedicated unit in PWD for environment and social management/ oversight but PWD has two engineers with environmental engineering education, but lack experience. Those staff assigned for environmental works in the donor funded project – gain experience. But get transferred to other works. Knowledge and expertise - not sustained. Due of lack of capacity – in preparation of this project PWD hired consultant for preparing environmental documents, Screening, EMF, EA and EMP.

Institutional arrangement proposed

For the implementation of environment safeguards in MSRP-2 , PIU will set up an Environment cell headed by Executive Engineer under the Project Director PIU. The Executive Engineer will be assisted by two Assistant Engineer (AE) who will be responsible for Group-1 and Group-2 roads. Each AE will be supported by Jounior Engineers (JEs). Each road project will have at least one JE during project preparation stage and may be more considering size of the road contract packages.

PIU will be supported by Project Preparation Consultant (PPC) environment team during project preparation stage and by Supervision Consultant's environment team during project implementation stage.

For longer term, PWD needs to establish a dedicated unit for Environmental and Social Oversight and Management. Members of the unit including PWD staff, contractor, and communities needed orientations and training on environmental management and mitigations subjects.

Institutional arrangements for EMF implementation of Group-1roads of MSRP -2 have been shown below and Same approach will be adapted for Group-2 roads also.

8. **EMF Budget**

Tentative budget for EMF implementation is **14 million INR** which include- Additional HR/ Consultant, Training & orientation, Monitoring, Institutional assessments for unit establishment, Induced & cumulative impact assessment, etc.