

**TOR for Independent EIA, Regional Biodiversity and Cumulative Impact Assessment Study for Trade Corridor Development in the state of Mizoram**

**for**

***Mizoram State Roads II Regional Transport Connectivity Project (MSRP II)***

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The Government of India has requested World Bank financing for the improvement and rehabilitation of State Highways and Major District Roads in the State of Mizoram that enhance connectivity to Bangladesh and Myanmar.

The roads being upgraded or studied for future upgrading under the project include: (Please refer to Map-1)

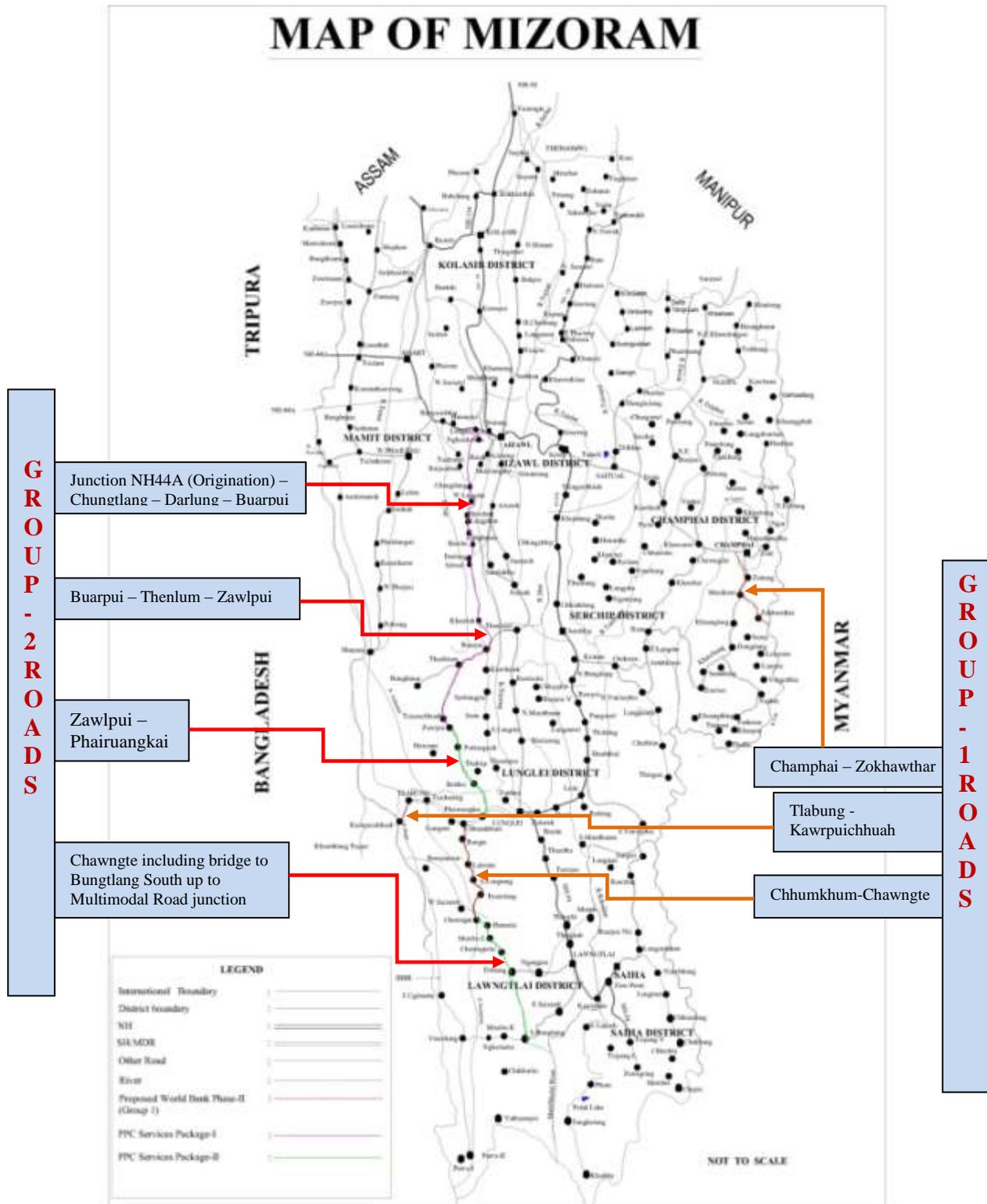
- **Group-I roads** (being upgraded through MSRP II), which include: the 12 km east-west Tlabung-Kawrpuchhuah road (which will link to nearby Chittagong Port in Bangladesh via a cross-border bridge and a new planned road on the Bangladesh side through Rangamati); the east-west 28km Champhai-Zokhawthar road (which connects to an existing border crossing to Myanmar), and the 42 km Chhumkhum- Chawngte road; and
- **Group -II roads** (being studied under MSRP II for subsequent upgrading), which include: 336 km north-south alignment starting at the NH44A junction between Aizawl and Tripura State passing through Thenlum, Phairuankai, Chawngte, and connecting to the Multi-modal Kaladan Road at the southern end. There are 4 specific road stretches being studied for upgrading along this corridor, as shown in Map 1:
  - Junction NH44A (Origination) – Chungtlang – Darlung – Buarpui(83km)
  - Buarpui – Thenlum – Zawlpu (95km)
  - Zawlpu – Phairuankai (30 km), and
  - Chawngte including bridge to Bungtlang South up to Multimodal Road junction (76km)

All the project roads are currently single lane roads with formation width approximately 5.2 m, without conforming to any standard / specification. As a result, the heavily loaded trucks and large sized vehicles find it difficult to pass through these stretches safely and expediently. The improvement works will consist mainly of widening and some new construction to two-lane Asian Highway standard; pavement construction; strengthening, improving, and constructing of bridges; cross drainage structures and longitudinal drainage; and provision of adequate slope protection works. Road stretches crossing semi-urban areas and villages may also require provision for covered drains, sidewalks and parking where required. In some cases, new alignments (by-passes) and/or realignments for the existing villages and towns may also be required.

The roads included in the project were selected because they are key corridors for trade and connectivity between district towns, interstate and international borders (Bangladesh and Myanmar). Improvement of these roads will connect the neighboring state and country economically and culturally. The residents of the Northeast, Bangladesh and Myanmar and countries beyond should benefit from the increased connectivity which is expected to result in increased trade and economic development in entire north eastern part of India. This will also improve quality of life of the people living along the road in the region.

The Project Implementation Unit (PIU) within the Public Works Department (PWD) of the Government of Mizoram is the implementing agency for the project. The PIU is located in the capital of Mizoram State, Aizawl.

**Map-1 Map showing the proposed roads under MSRP II**



In addition to the above mentioned World Bank funded road development projects, to improve the intra-state, inter-state and international connectivity, the Government of Mizoram is also planning for upgradation of NH-150, NH-54, NH-44A, Seling-Champhai road, Lunglei- Tlabung road, Multimodal road and other state roads with the funding from Government of India, and the Thenzawl-Seling road with the funding from ADB. Together, these projects are expected to have a transformational effect on connectivity and trade throughout Northeast India as well as with neighboring Bangladesh and Myanmar.

However, the potential negative environmental and social impacts, including at a cumulative and regional level, induced by transport corridor development also need to be assessed and managed to ensure that the development benefits are environmentally sustainable as well as shared equitably across local communities. Roads are agents of change, and therefore can be responsible for both benefits and damage to the existing balance between people and their environment. New roads may induce development in previously undeveloped areas, sometimes significantly affecting sensitive environments and the lifestyles of indigenous people. Disturbances to the natural environment may include soil erosion, impacts to streams and wetlands, damages to sensitive ecosystems, loss of productive agricultural lands, interference with animals and plant life, demographic changes, accelerated urbanization, increased deforestation and degradation of forests, and health effects to local communities along transit corridors.

It is important to identify potential impacts early in the road planning process and to make provisions for avoiding or mitigating these effects wherever possible. Failure to properly identify impacts may result in delays and cost increases later on in the project's development. Poor environmental management has also been shown to produce negative public perception of road projects, creating additional problems for those yet to come. A truly sustainable approach to road transport development requires accounting for the costs of the indirect effects of pollution and habitat disruption, change to the health and social and cultural well-being of communities, and impacts on the biophysical environment and bio-diversity, among others.

In the coming years, many new highways are planned for Mizoram under the National Development Policy. Although Mizoram has been declared as an ecologically sensitive area and is part of the Indo-Myanmar biodiversity hotspot, very little relevant work related to the biodiversity of the region has been reported, and even less which relates to the impacts on biodiversity from road development. Thus there is a need to develop a biodiversity baseline of the region, and ensure both comprehensive site-specific and regional/cumulative assessments of the impacts of this road development on biodiversity and the environment of the region. In addition, given the World Bank's involvement in the project, the assessments for the roads to be upgraded need to comply with World Bank safeguard policies in addition to national requirements.

PWD Mizoram therefore intends to hire consultancy services from a reputed firm for the following:

- To undertake an independent review of the draft Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) documents for the 4 Group II road

stretches that are being prepared by the environmental team within the overall Project Preparation Consulting (PPC) team (which is also preparing detailed designs)<sup>1</sup>, and undertake updating / enhancement and preparation of a set of independent EIA and EMP documents as required in order to ensure full compliance with World Bank and national standards;

- To develop a regional biodiversity baseline and carry out a Strategic and Cumulative Environmental Impact Assessment, focusing in particular on impacts to biodiversity and forest resources, due to proposed trade corridor development in Mizoram, and propose strategic management and planning measures to address potential impacts.

### **Scope of Work**

***Task 1: Independent review of 4 draft EIAs and EMPs for Group II roads, and preparation of independent EIAs and EMPs, including inputs into Bill of Quantities and construction contract specifications, in line with World Bank and national standards.***

The first task of this consultancy is to carry out independent screening and review of environmental aspects of the Group II roads, advise PIU-PWD and the Project Preparation Consultant (PPC) environmental team on preparation of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) documents for each Group II road, review all draft deliverables of the PPC environmental consulting team, **and produce final independent versions of the EIAs and EMPs for each Group II road stretch (total of 4)**. The consultant will utilize the information collected and assessments carried out by the PPC's team of environmental consultants, and shall supplement these as required with independent assessment, fieldwork and consultations as required, in order to ensure that final products are fully compliant with World Bank safeguard policies and related guidelines and standards, as well as national requirements.

The main objective of the consultancy is to ensure that all environmental issues are properly and independently assessed, reflected in the final engineering designs so as to avoid or minimize environmental impacts to the extent feasible, and that detailed and comprehensive EMPs are developed for all impacts which cannot be avoided, including specifications for construction contracts as well as institutional arrangements and measures to ensure their full implementation. As per World Bank safeguard policy requirements for Category "A" projects, the final environmental assessment work must be carried out independently from engineering design works. The proposed consultancy will therefore draw heavily from the work of the PPC's environmental consulting team, and interface extensively with the PPC team, but will ensure the required independence of the final assessments from the engineering design process.

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<sup>1</sup> The Environmental Assessment component of the detailed TOR for the Project Preparation Consultant is provided in Annex B.

The consultant will be stationed in the PIU-PWD project office in Aizawl, and work as a team with the core group of counterpart staff and the firm of consultants. The Consultant's scope of services shall include, but not be limited to the following:

1. Review the preliminary environmental screening reports of each of the four Group II roads carried out by the PPC environmental consultant team as well as screening carried out by the PIU-PWD, and carry out an independent screening in order to confirm the project impact zone and the proposed scope of full EIA and EMP work to be required for each road.
2. Review and finalize the detailed TOR for each EIA and EMP, as proposed by the PPC environmental consulting team, adjusting as necessary in order to ensure full compliance with World Bank safeguard policies, Environmental Health and Safety (EHS) Guidelines, and national requirements and standards.
3. Review and provide comments to the draft baseline chapter of the PPC environmental consulting team, in order to ensure all baseline conditions relevant to the project are appropriately documented and understood, to enable a sound basis for the impact assessment. If there are gaps in the baseline, carry out complementary secondary research, and, if required and following discussions with PWD, primary research to fill critical gaps.
4. Review the full draft EIA for each road produced by the PPC environmental consulting team. Carry out an independent assessment process to verify and supplement as needed the findings of the PPC assessment, so as to ensure identification and analysis of all potentially significant impacts (including long term vs. short term, reversible vs. irreversible, localized vs. regional, direct vs. indirect, and cumulative as applicable) and all necessary and appropriate mitigation measures to address these impacts adequately.
5. Pay particular attention to specific requirements of World Bank policies, including but not limited to the requirements of OP 4.01 Environmental Assessment, OP 4.04 Natural Habitats, OP 4.36 Forests, OP 4.11 Cultural Property, as well as climate change risk screening and assessment (a new requirement for all IDA-financed projects as of July 2014). The consultant shall verify all applicable World Bank safeguard policies.
6. Review the draft analysis of alternatives developed by the PPC environmental consulting team, discuss with both environmental and engineering consulting teams of the PPC, and use own expertise in order to ensure that all relevant and significant environmental and social aspects have been taken into account in identifying and evaluating alternatives and selecting final features of project design, alignment, construction methods and technologies, and other aspects as appropriate. This should include the no-project scenario. The alternatives analysis write up should indicate the major modifications incorporated in the proposed project due to environmental considerations.

7. Carry out, as part of the assessment, an evaluation of the anticipated impact due to climate change in the context of road development, in terms of road design factors like embankment height, drainage, slope protection, slope stability. Consider climate change's potential impact / influence on appropriate bioengineering technologies to be adopted in the EMPs.
8. Carry out a Cumulative Impact Assessment for the full trade corridor (see Task 2 under this consultancy), and integrate a summary of the assessment into each EIA as well as relevant findings and recommendations into each EMP at the individual road level.
9. Review and ensure appropriate Environmental Management Plans are developed for each proposed road. This includes, *inter alia*, making sure that all mitigation measures identified in the EIAs are applicable and fully specified at the design, construction and operational stages; ensuring that any identified seasonal mitigation measures or other restrictions related to construction timelines and schedules (such as to accommodate wildlife migrations, restrict working hours near villages or marketplaces, etc.) are fully specified, ensuring that the performance indicators selected are easily comprehensible, measurable and practical; checking that the engineering designs and implementation plans are fully updated to reflect environmental considerations; verifying that measures to manage health and safety issues for construction workers and communities have been properly specified; ensuring that a suitable community grievance mechanism is designed; etc. Particular focus shall be placed on erosion control and prevention measures, including bioremediation / bioengineering measures proposed for both construction and operation & maintenance phases of the roads.
10. With respect to social aspects, the consultant is not expected to review or prepare detailed plans on land acquisition and resettlement. Detailed Social Assessments and Resettlement Action Plans will be carried out by the PPC Consultant as free-standing reports. Nonetheless, each EIA should provide a brief summary of the corresponding Social Assessment, and should reference the Resettlement Action Plan in the EMP.
11. Review, identify and plan for plantation of the suitable trees along the existing highway in accordance with IRC guidelines, World Bank OP 4.36 on Forests, and World Bank OP 4.09 on Pest Management, as applicable.
12. Review and give special attention to the proposed environmental enhancement measures for each road under study, and shall propose modifications and/or supplementary measures to those identified the full environmental consulting team as necessary in order to maximize the environmental and social benefits of the project, for example to include, *inter alia*, the following:
  - Cultural property enhancement along the highways

- Bus bays and bus shelters in environmentally suitable and socially appropriate locations
  - Highway side landscaping and enhancement of the road junctions
  - Enhancement of highway side water bodies (in consideration of recreational and agricultural / water storage uses, and so as to minimize health risks i.e. creation of mosquito breeding grounds)
  - Redevelopment and remediation of borrow areas and disposal sites
13. Review and ensure a suitable monitoring plan for all Group II roads with regard to all pertinent aspects identified through the EIA studies, in particular on air, water and noise pollution, biodiversity, etc. The consultant will also provide additional inputs in the areas of performance indicators and monitoring mechanisms for environmental components during both construction and operational phases of the project.
  14. Review the proposed consultation plans for the draft EIAs and EMPs, and provide support to PIU-PWD as requested to develop consultation materials and carry out consultations, in conjunction with the PPC environmental consulting team and/or independently (i.e. additional consultation meetings or event with stakeholders) if required.
  15. Review and provide the cost of mitigation measures and ensure that environment, health and safety related staffing, training and institutional requirements are budgeted in project cost.
  16. Review and prepare the bill-of-quantities (BOQ) and technical specifications for all items of work in such a way that these may be readily integrated into the construction contracts.

### ***Task 1 Reporting Requirements***

The consultant shall prepare the following deliverables:

1. Inception report, including work plan, methodology and the detailed timeframe for the completion of the assignment.
2. Report summarizing review of the Environmental screening reports already carried out by the PIU-PWD and the PPC environmental consulting team, as well as the consultant's own environmental screening assessment, and including proposed final TORs for the full EIAs and EMPs to be completed for each road segment.
3. Stand-alone EIA/EMP reports for each of the four Group II road segments as per the requirements of the World Bank and PWD, as applicable, with contents including the following. Each report will be subject to review by PWD and the World Bank, and the consultant will be expected to revise the reports in line with comments received.

- Executive Summary (in English and Mizo, using non-technical language suitable to a general public audience, generally no more than 15-20 pages)
- Description of the Project and definition of Project area of influence / impact zone
- Policy, legal and administrative framework, including state and national level applicable policies and guidelines, as well as World Bank operational policies, EHS Guidelines and related requirements.
- Environmental and social baseline of the project area of influence
- Identification and analysis (including determination of significance) of the potential environmental and social impacts associated with the project (during pre-construction, construction and operation periods, including positive and negative, direct and indirect, induced, long-term vs. short-term, and cumulative impacts and effects). Include discussion on the effects of anticipated climate change on the impact assessment, and considerations for road design and mitigation measures.
- Cumulative Impact Assessment for the proposed project, including recommended measures to address identified impacts. (See also Task 2 under this consultancy for more information on this component.)
- Analysis of alternatives considered from an environmental and social perspective, and justification for the final selected alternatives, in terms of with vs. without project, alignments/routing, alternative design aspects including materials sources, alternative construction technologies and timeline considerations, etc.
- Environmental Management Plan, covering both construction and operation phases, including all required mitigation, management and enhancement measures for identified impacts. Measures to be required of contractors should be presented in consolidated tables (one for each contract package, corresponding to the specific chainage of each) in a format that can be easily annexed to construction contracts. Detailed plans and diagrams for highway-side tree plantations (as part of the compensatory afforestation program) shall be included. EMP should also include a detailed monitoring plan for both construction and operation phases including indicators, methodologies and measurement techniques, frequencies and locations; institutional responsibilities and budget for each item. Full costing / budgeting, and a schedule for all specified measures, vis-à-vis construction schedules, should be included. A description of the organizational and implementation responsibilities for the EMP, an assessment of institutional capacity and specified required training and capacity building measures, should also be specified.
- Detailed bill-of-quantities (BOQ) and technical specifications for the specific EMP measures associated with each road, in such a way that these may be readily integrated into the construction contracts.
- Summary of the public consultation process undertaken, feedback received, and how it has been taken into account in the study (detailed minutes, including a register of participants, summary of proceedings, a matrix of key feedback received and responses, and photolog should be provided in annex).

- Appendices; including: maps of each project area showing important environmental and social features and land uses, references / secondary sources consulted, detailed tables of data collected by the PPC environmental consulting team as well as the independent consultant as applicable, records of consultation meetings, data, photographs; Terms of Reference and CVs of key report preparers; etc.

### **Reporting Schedule :**

The entire task is envisaged to be completed within approximately 240 days of mobilization, including receipt of all information, documents and work order. However, the timeline may be adjusted in mutual agreement with PIU-PWD, based on the progress of the parallel PPC environmental consulting team, given that the proposed assignment will draw heavily from, and require extensive interface with, that team. The anticipated schedule for reporting milestones is presented below. This will be further discussed and finalized/agreed with PIU-PWD during the mobilization period.

<b>Deliverable to be submitted to PIU-PWD</b>	<b>Anticipated schedule</b>
Inception report	Within 2 week of mobilization
Environmental screening review report including proposed final TORs for the full EIAs and EMPs to be conducted for each road	Within 6 weeks of mobilization
Finalized scope of detailed EIAs and EMPs for each road (4), following discussion with PWD and incorporation of feedback received from PWD and World Bank	Within 10 weeks of mobilization
Draft independent EIA and EMP reports for each road (4), as per agreed detailed TOR	Within 24 weeks of mobilization*
Revised independent EIA and EMP reports for each road, taking into account feedback received from PIU-PWD and World Bank, as applicable, and incorporating feedback received during public consultations	Within 28 weeks of mobilization*
Final independent EIA and EMP reports for each road, incorporating any final feedback received from PIU-PWD and World Bank	Within 30 weeks of mobilization *

\*The timeframes indicated for draft and final EIAs for the Group II roads are approximate, as they will ultimately depend on the progress of the PPC consulting team.

## ***Task 2: Strategic and Cumulative Environmental Impact Assessment on biodiversity due to proposed road development in Mizoram***

Mizoram's terrain is a geologically distinctive area of low but steep hills (known as the Lushai hills), sandwiched in a north-south direction, and separated by deep, narrow river gorges. On average, the hills are 900 - 1,000 meters high, and slightly higher in the east. According to the Forest Survey of India, the forest cover in the state in 2013 was 90.38%, placing it as the most heavily forested state in India in terms of percent forest cover.<sup>2</sup> Of forested lands, 28.6% are classified as "very dense" or "moderate dense" forest by the Forest Survey of India. The state falls squarely within the Indo-Burma Region (covering the Eastern Himalayas), which is one of 25 designated "hotspots" of biodiversity under the Critical Ecosystem Partnership Fund, which is jointly financed by the World Bank, GEF, Conservation International and other NGOs specialized in biodiversity and information systems. The Indo-Burma Region was selected as a "hotspot" as a globally vital ecosystem and biodiversity rich region judged to be most threatened by development. Mizoram has important areas of biological significance and gene pools of a variety of flora and fauna. Within India, the entire North-East region – the transition zone between India, Indo-Malayan and Indo-Chinese geographic regions—is recognized under the National Biodiversity Strategy and Action Plan to be an eco-region. Academic and research institutes in India also refer Mizoram and the Lushai hills area as being important from a biodiversity perspective, with high numbers of endemic plants<sup>3</sup>. Although the Lushai hills have not been fully surveyed, known endemic herbs and shrubs include the small tree *Glycosmis cyanocarpa*, a "flagship" species; the woody climber *Deris lushaiensis*, a medicinal plant; and the shrub *Rhododendron johnstoneanum*, a genetic resource species, among others. From all accounts, Mizoram is a "bio-diversity rich"<sup>4</sup> area.

Road development in heavily forested and high biodiversity areas globally has been shown repeatedly to be highly correlated with loss of forest cover and biodiversity. Construction itself may cause soil erosion, impacts to streams and wetlands, damages to sensitive ecosystems, loss of productive agricultural lands, interference with animals and plant life, etc. The even greater environmental and social effects (positive and negative) of roads, however, include those induced by new regional access and transport patterns. On the positive side, corridor development can open up market access and facilitate trade and economic development for previously isolated communities. On the negative side, the changes to land use associated with greater regional access, movement and trade in a context like Mizoram are likely to include an expansion of areas under jhum (shifting) cultivation, with resulting increased deforestation, forest habitat degradation, soil erosion and loss, etc. Population influx can also exacerbate unsustainable forest harvesting and lead to increased wildlife poaching. While any single stretch of road taken in isolation may not alone rank these effects to be highly significant at a regional

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<sup>2</sup> Forest Survey of India, *India State of Forest Report 2013*.

<sup>3</sup> Nayar, M.P. 1996. *Hot spots of endemic plants of India, Nepal and Bhutan*. Tropical Botanic Garden and Research Institute, Thiruvananthapuram, pp. 254.

<sup>4</sup> Biological diversity is defined under the Convention on Biological Diversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems."

scale, together the regional induced and cumulative effects of trade corridor development and upgrading in Mizoram may indeed be significant. Individual EIAs for specific road stretches often fail to fully characterize and quantify such impacts.

As per the World Bank OP 4.04, the conservation of natural habitats<sup>5</sup>, like other measures that protect and enhance the environment, is essential for long-term sustainable development. Considering Mizoram's national importance in terms of its remaining degree of forest cover, and its international importance as part of the Indo-Burma Region biodiversity hotspot in particular, a strategic regional study is therefore warranted in conjunction with the site-specific EIAs for specific road stretches. This strategic study will aim to identify and assess the potential regional and cumulative effects to natural habitats and biodiversity at the trade corridor level, and to outline measures beyond the scope of site-specific mitigations, that can help to ensure trade corridor development in Mizoram does not come at the expense of the state's rich forest and biodiversity resources.

This strategic study shall be carried out in parallel to Task 1, as its findings and recommendations should be integrated where possible into the EIAs and EMPs of the individual road stretches. However, it is expected that the recommendations will also go beyond the scope of these individual EMPs.

## **Objectives of Task 2**

This task's objectives are:

- To provide an enhanced basis for factoring forests and biodiversity conservation considerations into decision making about trade corridor development in Mizoram, in addition to financial and social considerations,
- To assess the cumulative and induced impacts of proposed trade corridor development projects on forest habitat and biodiversity at a regional scale, and
- To contribute towards embedding good practices in biodiversity and forest conservation into road sector development and master planning in Mizoram generally, as well as specifically into development of the trade corridors.

## **Study area for Task 2**

The specific geographic extent of the study area should be proposed by the consultant following initial review of available secondary source information and key stakeholder discussions. Nonetheless, it should generally encompass the following:

- a. The area of influence (both direct and indirect) of the full trade corridors that the Groups I and II road segments are part of, e.g. from Aizawl up to the state/international borders for each, including areas of ecological connectivity and interdependency from an ecosystem perspective.

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<sup>5</sup> Natural habitats, as per World Bank OP 4.04 para 1(a), are "land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the areas primary ecological functions."

- b. For Task 2.2 specifically (land use and deforestation trend analysis), the study area will be broader and should look at a state (or potentially even Indian Northeast Region) level, but focus on areas where roads have recently been developed or upgraded in the last 10-15 years and where satellite data availability permits, given that the goal of this task is to examine outcomes and trends along other road development projects in the region.
- c. Any potential areas for expansion of agricultural, industrial, commercial, or other types of economic activity should also be considered in the definition of the study area. These should be based to the extent possible on known trends as well as existing government planning at local and national levels along the corridors of interest.

## **Scope of Task 2**

Specific activities of the task are outlined below. It is expected that Task 2.1 will proceed with highest priority so that the findings can directly support and be incorporated into the baseline assessments of the four Group II roads EIAs being finalized under Task 1 of this consultancy. However, all subtasks under this task are directly relevant to the Task 1 assignment and to building PWD's capacity to implement the EMPs developed under Task 1 for the Group II roads, and therefore should proceed in parallel to the progression of Task 1 to the extent possible.

### **2.1 Baseline assessment of biodiversity, forests and land use in the trade corridor area of influence.**

Through extensive secondary as well as more limited primary data collection and analysis, develop a solid baseline of biodiversity, forest and water resources, and overall land use in the study area. The consultant shall draw heavily on existing relevant sources of information on biodiversity and forest resources and plans in Mizoram (see Annex A for a partial list of such resources), global datasets on forests and biodiversity<sup>6</sup>, as well as existing / recently completed EIAs and EMPs for specific road development projects in the state (including the EIAs for the Group I roads under MSRPII). The consultant shall also coordinate this baseline assessment with the EIA baseline assessment process for the Group II roads as per Task 1. Available existing secondary information shall be supplemented with field data collection efforts, focusing on geographic areas of likely high biodiversity value.

Specific tasks under this sub-task include:

- Obtain or develop map layers identifying any areas of critical habitat for known key species, regional wildlife migratory corridors (as applicable), forest cover and management status (including protected areas, forest reserves, community and collaborative forests, and private forests), hydrology, meteorology and key land uses including agricultural areas, settlements, etc.
- Identify and characterize the presence of rare, endangered and threatened (RET) species of flora and fauna of different road corridors, based on secondary data, stakeholder interviews and field surveys. Provide lists of flora and fauna in both core and extended influence areas of the

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<sup>6</sup>For example: (a) IUCN spatial dataset on 50 year species extinction probability; (b) Hansen datasets on global forests cover (see Hansen et al. (2013), "High-Resolution Global Maps of 21st-Century Forest Cover Change", *Science* 15 November 2013, 342 (6160): 850-853; and <http://earthenginepartners.appspot.com/science-2013-global-forest>).

corridors, as per Red Data Book. Delineate and show on a map road stretches critical for conservation of rare, endangered and threatened (RET) aquatic species. Assess and characterize ecological flows required for conservation of rare, endangered and threatened (RET) floral and faunal species.

- Characterize the ecology including breeding and migratory patterns, and habitat needs, of migratory birds in the study area.
- Identify any other important indicator species from a biodiversity perspective, and record the frequency, abundance, distribution and dislocation of these species in the impact area of the project.
- Study and characterize the riverine forests, forest plantation areas, and aquatic habitats in the rivers and streams in the area of influence of the road corridors from a forest habitat quality and biodiversity perspective. Aquatic assessment should include in particular the Tuichang, Phairangkhai and Karnaphuli canal at the border of Bangladesh over which a bridge has been proposed.
- Characterize community dependence on plants and animals, and incidence of human-wildlife conflicts.
- List important medicinal plants and indicate their frequency, abundance, and distribution in the study area.
- Identify, geo-reference and characterize any specific locations or hotspots where wildlife crossings are known to take place (broken down by species, time of day, and season to the extent possible), based on key stakeholder interviews and review of literature.
- Based on the information collected, document key areas warranting particular attention under the detailed EIAs for specific road improvement activities, or which have particular conservation value, for future conservation programs.
- Develop a Bio-diversity Monitoring Plan, including indicators, methodologies, frequencies, locations, etc., to track impacts to biodiversity due to road development, with a focus on areas of likely incidence of priority RET, socially important, and/or other indicator species, and with appropriate methodologies to track the aforementioned priority species.

*Output # 2.1: Report including a map showing proposed study area extent, written rationale for study area, and baseline assessment write-up (with accompanying map layers and data tables).*

**2.2 Land use change and deforestation trend analysis for past road development or upgrading in Mizoram and Northeast India**, to provide a deeper understanding of the potential future indirect and induced effects to forests and land use of future road development.

Using GIS, identify and map trends in deforestation, forest fragmentation, and, to the extent feasible based on data availability, broader land use changes corresponding to loss of forest cover (e.g. to classify new uses according to agricultural, urban / settled, industrial etc) within the study area. Analyze their linkages with road development and use, and their induced social and environmental effects. The purpose of this retrospective analysis is to identify trends that can inform the analysis of likely effects resulting from the proposed trade corridor development. Specific tasks will include:

- Obtain a road network map for the region. Define a modeling methodology appropriate to evaluate trends and options and support understanding and decision-making by stakeholders. Suggested methodology: in GIS, overlay available time-series geospatial datasets on land use and

forest cover<sup>7</sup> to carry out an historical analysis of deforestation and trends in land use change in areas of road development. Discuss observed trends, especially with respect to any notable effects on jhum (shifting) cultivation patterns (for example, net increase in land being cleared and used for shifting cultivation, or a shift on the location of areas allocated for shifting cultivation e.g. to prioritize land close to the roads, etc).

- Using the historical trend analysis, stakeholder interviews/discussions, secondary literature and the baseline assessment completed under Task 2.1, identify and characterize the most critical induced social and environmental impacts related to observed historic land use changes. Discuss the likely effects of forest loss, including increased soil erosion and landslide propensity, biodiversity impacts, livelihood impacts, and others.

*Output #2.2: Land use / deforestation trend analysis report and map series.*

### **2.3 Strategic analysis of the cumulative and induced impact of Mizoram’s planned trade corridor development projects on biodiversity and forest resources**

Drawing on the findings of the biodiversity baseline established under Subtask 2.1 and the trend analysis carried out under Subtask 2.2, carry out an analysis of the cumulative and induced impacts which may result from proposed trade corridor development. This analysis should include the following steps:

a) *Identification of priority Valued Environmental Components (VECs) upon which the cumulative and induced impacts are to be measured:*

Propose a list of potential VECs– e.g., potential receptors of value to stakeholders and/or because of their biodiversity significance which could be significantly impacted by trade corridor development – which should be the focus of the analysis and strategic consideration in trade corridor development decision-making. Identification and prioritization of VECs should be done considering the purpose of assessing the potential effects of road corridor development on the environment. The initial list should be generated by reviewing existing biodiversity information, consulting with local experts and stakeholders, and conducting preliminary surveys as necessary. For each VEC, its rationale for inclusion and its relationship with the road corridor development program should be provided. The VECs may be drawn from a wide measure of environmental factors, including the physical environment (media and habitats), vegetation, wildlife, species at risk, aquatic resources, the social environment, economic environment, land and resource uses, physical and cultural heritage, etc. The criteria to be used to select or identify VECs should be objective, consistent, transparent and defensible. Ecosystem attributes that may be selected as VECs may include distinct genetic populations of a species, species level populations, species assemblages, vegetation communities, habitats and ecosystem functions. Species attributes that may be used as criteria for their selection as VECs may include, for example, their commercial value, rarity, endangerment, role as flagship or umbrella species (provide benefit to others through their conservation), importance for ecosystem function (keystone species), value as indicator species, etc.

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<sup>7</sup>Suggested: the Hansen time-series satellite imagery based dataset on forest loss and gain from 2000-2012 (see Hansen et al. 2013 and <http://earthenginepartners.appspot.com/science-2013-global-forest>), supplemented with additional relevant datasets identified or developed by the consultant

Drawing from the baseline assessment completed under Task 2.1, for each VEC identify indicators by which to measure the impact, and thresholds for each indicator.

The following table lists a few *potential/example* VECs, and some potential indicators for each. These shall be considered examples only. The consultant will generate a specific list appropriate to the assignment as part of the scope of work. In addition, thresholds (not shown in example) need to be assigned for each selected indicator to enable monitoring.

<b><i>Example VEC</i></b>	<b><i>Example indicators to measure change in condition of VEC</i></b>
Forest cover	Total forest area lost (directly or from induced land use change) Loss of high density / medium density forest Reduction in measurable associated forest-based ecosystem services (such as slope stability / erosion control, provision of non-timber forest products to local communities, etc)
Populations of key species (for example, regionally rare or protected species, indicator species) to be identified by the consultant, based on the baseline assessment task	Changes in regional populations of key species Degree of population fragmentation Number of road accidents and fatalities involving wildlife Changes in local incomes related to use of natural resources / biodiversity in question
Condition of watershed/catchment area	Number of landslide events Total area affected by soil erosion/landslides and slope instability Kilometers of road affected by landslides/ slope instability, and number of days (or time) roads are obstructed (no traffic movement) Changes in local incomes due to loss of topsoil, erosion/landslides of agricultural land, etc.

Engage key stakeholders (such as local communities, NGOs, and government agencies) to get feedback on priority VECs and indicators and thresholds for analysis. Based on feedback received, select 2-3 priority VECs to be the focus of further study. Document the decision process and rationale.

**b) *Impact analysis of trade corridor development on the VECs***

For the trade corridors in the study area, review available feasibility studies, information on proposed alignments, road width and design standard, proposed traffic type (cargo vs. passenger vehicles, local vs. regional traffic, etc.), and projections on traffic volumes and speeds.

Assess -- showing spatially (in map format) wherever possible -- the potential anticipated induced and aggregate/cumulative environmental and social impacts and risks to the VECs from trade corridor development, in terms of the identified indicators. Consider combinations of corridor development together with other transport, industrial, or other development activities underway or planned in the study area which may also affect the VECs (to be identified based on stakeholder inputs and through further discussion with PWD). Explore additive, countervailing, masking, and/or synergistic effects. Determine impact magnitude and significance in terms of its potential to affect the sustainability or viability of the VEC, in light of the defined thresholds. Consider also the anticipated effect of climate change to the significance of the impacts on the VECs.

As part of the analysis, develop maps which extrapolate from the findings of the analysis of past land use changes completed under Task 2.2 and draw from the baseline information on sensitive and critical areas from Task 2.1, in order to show spatially the potential scenarios of forest cover loss and other expected induced land use changes based on trade corridor development.

*c) Alternative analysis of different development scenarios, and recommendation of preferred option(s) and prioritization of roads for upgrading, in light of environmental aspects*

Through discussions with PWD and the PPC consulting team, identify potential adjustments or alternative alignments or design options for trade corridor development (including but not limited to the Group 2 road stretches) to minimize identified impacts such as fragmentation and erosion / slope instability, to ensure connectivity of wildlife corridors, etc. Document a comparative analysis of the potential effects on the VECs for identified alternatives, to provide a basis for strategic decision making. Rank the alternatives from an environmental perspective, quantifying the comparative costs/benefits to the extent possible. Provide an overall recommendation (with justification) of most environmentally optimal trade corridor development option (or combination of options), as well as prioritization of roads for upgrading.

*d) Identification of measures, programs, and areas for further study to minimize negative residual effects*

For the selected alternative, identify measures to reduce identified residual negative environmental and social impacts and maximize positive effects to the VECs, at a conceptual level. Measures should go beyond activities typically within the scope of the contractor and/or PWD, as these will be covered in the road-specific EMPs under Task 1. In addition, sustainable and effective solutions to complex cumulative, induced and regional effects often require a multi-sectoral approach. Some examples of potential measures and programs to be considered by the consultant include:

- Road design and alignment adjustments, such as reduced width near settlements or areas of critical habitat, wildlife underpasses, speed limits and traffic calming measures to reduce wildlife fatalities, realignments to avoid land-slide prone areas, etc.
- Bioremediation / bioengineering and reforestation programs
- Support to village development committees for long-term planning of allocation of community lands for jhum cultivation that considers environmental aspects

- Agricultural extension and soil conservation programs to help small farmers transition away from jhum practices towards more intensive, environmentally sustainable farming practices
- Logging and forestry management programs
- Biodiversity offsets e.g. support to planning and management of priority conservation areas; wildlife monitoring programs; etc.
- Institutional strengthening measures (including for forest and wildlife agencies, village biodiversity management committees, village forest development committees, and others as applicable)

Identify specific aspects for further study and priorities for mitigation and management measures which would be developed in more detail under the detailed EIAs/EMPs for specific road stretches within the trade corridors.

*e) Stakeholder workshop on the analysis and finalization of the report.*

Carry out a public workshop with diverse stakeholders to present the findings of the analysis and receive feedback from stakeholders. The workshop should also gather input on specific aspects requiring further study and detailed analysis for the trade corridors to be upgraded.

Revise the draft report to take into account the feedback received during consultations, as well as feedback from PWD, the Mizoram Department of Forests and Environment, and the World Bank.

The draft and final reports should include detailed documentation of all consultation events in an annex to the final report, including a summary of the date(s) and location(s) of event(s), how they were publicized, who participated, what issues or comments were raised, and how they have been taken into account.

*Output #2.3: Strategic Analysis of Cumulative and Induced Effects of Trade Corridor Development (draft version prior to the workshop, and final version reflecting feedback received)*

## **2.4 Capacity building and guidance development**

Review existing guidelines and manuals in Mizoram and other Northeastern states (as applicable), as well as literature and resources on internationally tested good practices. Improve / update existing manuals, and develop additional manuals and guidance resources where needed, for road sector planners, developers and contractors in Mizoram, related to:

- a. Mainstreaming biodiversity management considerations into road design, construction and use
- b. Good practices in bioengineering and bioremediation in hill road context
- c. Good practices in promoting forest conservation through road development (such as programs to strengthen community management of forests along right-of-ways, good practices in reforestation programs; etc.)

Deliver a workshop in Aizawl to share the core contents of the resources with PWD engineers, contractors, and others in the road sector, on mainstreaming good practices in biodiversity and forest conservation into trade corridor and other road development planning and upgrading.

*Output #2.4: Manuals for mainstreaming biodiversity and forest conservation into trade corridor development; delivery of workshop in Aizawl.*

**Reporting Schedule for Task 2:**

All deliverables shall be submitted to the PIU-PWD for the Mizoram State Roads Project II, who will provide feedback on drafts. PIU-PWD will also share all draft and final deliverables with DOEF (Department of Environment and Forests of the state of Mizoram) and the World Bank for their further inputs and comments, and will consolidate all comments to provide to the consultant.

This task is envisaged to be completed within 12 months of receipt of all information, documents and work order along with mobilization advance. The proposed reporting schedule is as follows. Adjustments may be made in agreement with PIU-PWD.

<b>Deliverable to be submitted to PIU-PWD</b>	<b>Anticipated schedule</b>
Report including a map showing proposed study area extent, written rationale for study area, and baseline assessment write-up (with accompanying map layers and data tables).	Within 8 weeks of mobilization
Land use / deforestation trend analysis report and map series	Within 12 weeks of mobilization
Draft Strategic Analysis of Cumulative and Induced Effects of Trade Corridor Development.	Within 22 weeks of mobilization
Manuals for mainstreaming biodiversity and forest conservation into trade corridor development; delivery of workshop in Aizawl.	Within 26 weeks of mobilization
Final consolidated report, reflecting stakeholder inputs from workshop and comments received from PWD and World Bank on all draft components	Within 30 weeks of mobilization

## **Overall consultancy timeline and proposed payment modality (tasks 1 and 2)**

The overall proposed timeline, as well as payment schedule, for the full consultancy are outlined below.

<b>Items</b>	<b>Proposed Schedule (# of weeks from mobilization)</b>	<b>Payment due (% of total fee) - proposed</b>
<b><u>Task -1</u></b>		
Inception report	2 weeks	5%
Environmental screening review report including proposed final TORs for the full EIAs and EMPs to be conducted for each road	6 weeks	5%
Finalized scope of detailed EIAs and EMPs for each road, following discussion with PWD and incorporation of feedback received from PWD and World Bank	10 weeks	5%
Draft independent EIA and EMP reports for each road, as per agreed detailed TOR	24 weeks*	10%
Revised independent EIA and EMP reports for each road, taking into account feedback received from PIU-PWD and World Bank, as applicable, and incorporating feedback received during public consultations	28 weeks*	10%
Final independent EIA and EMP reports for each road, incorporating any final feedback received from PIU-PWD and World Bank	30 weeks*	15%
<b><u>Task -2</u></b>		
Report including a map showing proposed study area extent, written rationale for study area, and baseline assessment write-up	8 weeks	10%
Land use / deforestation trend analysis report and map series	12 weeks	10%
Draft Strategic Analysis of Cumulative and Induced Effects of Trade Corridor Development	22 weeks	10%
Stakeholder workshop on draft Strategic Analysis of Cumulative and Induced Effects of Trade Corridor Development	24 weeks	-
Manuals for mainstreaming biodiversity and forest conservation into trade corridor development; delivery of workshop in Aizawl.	26 weeks	10%
Final consolidated report for Task 2	30 weeks	10%

\*The timeframes indicated for draft and final EIAs for the Group II roads are approximate, as they will ultimately depend on the progress of the PPC consulting team.

## **Key Qualifications of the consulting team**

A multidisciplinary team will be required to complete this study. The core team is expected to include the following key individuals, who should be supported by additional staff as required. The core competencies for all key individuals include: self-starting; independent and responsible personality; ability to take initiative and work in teams; track record on following through with commitments and meeting deadlines; and strong written and oral language skills in English.

The core team should include at minimum the following specific areas of expertise:

- a. *Team leader* with at least 20 years of relevant experience in environmental and social assessment and management in the transport sector, including Strategic-level assessments encompassing alternatives analysis and planning at a regional level, and a minimum of a Master's Degree in Biology, Environmental sciences, Environmental engineering and/or Management, or a related field (a PhD would be an advantage). The team leader should also possess strong skills in landscape-level assessment and geospatial analysis using GIS. Experience with Cumulative Impact Assessment, preferably in the hill road sector, is required. Familiarity and past experience with both GoI and World Bank policies and regulations related to environmental assessment and management, wildlife conservation, and land use planning, is required.
- b. *Senior Biodiversity Specialist*: A person with at least 20 years of relevant experience in environmental and biodiversity assessment and conservation. He should be Master's Degree in Biology, Environmental sciences, or a related field (a PhD would be an advantage). The individual will possess at least 15 years of experience on biodiversity management aspects of infrastructure related projects, including on good practices in biodiversity friendly road engineering and design. Experience in India's Northeast region, and the specific biodiversity and forest characteristics and issues of the region, is a strong plus. Prior experience with World Bank safeguard policies, in particular Operational Policy (OP) 4.04 (Natural Habitats) and OP 4.01 (Environmental Assessment) is also strongly desirable.
- c. *EIA specialist*: Master's Degree in Biology, Environmental sciences, Environmental engineering and/or Management, or a related field (a PhD would be an advantage). 15 years experience in carrying out EIAs, preferably in the hill road sector, is required. Experience carrying out one or more EIAs for road project(s) in accordance with World Bank policies and regulations is strongly desirable. Past experience conducting Cumulative Impact Assessment is also desirable.
- d. *Biodiversity specialist / Ecologist*: A person with Master's Degree in Biology, Environmental sciences, or a related field with 10 years of experience in ecology biodiversity related activities, including conducting biodiversity baseline assessments and fieldwork, and at least 5 years of relevant experience in road projects also required. Existing knowledge of the ecology of the Indian Northeast region, and ideally Mizoram in particular, is strongly desirable.
- e. *GIS expert*: A person with Master's Degree in Geology/ Geography /engineering and/or Management, or a related field (a PhD would be an advantage). He/she should have Post graduate/post graduate diploma in GIS and remote sensing, The individual will possess at least 15 years of experience with at least 5 years of relevant experience in road projects.

The core team will be supported with relevant additional team members and assistants as required to carry out the assignment.

### **Consultant's obligation**

The consultant shall be responsible for all personal, computer, transport (including international and domestic air travel as well as vehicles for local transport), and field related equipment, supplies, consumables, and other expenses associated with executing this assignment, and shall make provisions for the same in his financial proposal. For transport, the consultants shall make provision for the rental of vehicles including running and maintenance charges in their financial proposals. No provision for purchase of vehicles shall be made by the consultants in their financial proposals. Expenses related to acquisition of reference materials, maps, etc. as required for the completion of the assignment and which are not already available through PWD, as well as for all materials and field expenses related to the execution of stakeholder workshops and consultation events, shall also be borne by the consultant, and cost into the financial proposal. Consultant will be responsible for any translation of documents and for processing of data. To facilitate the close interaction and collaboration with the client (PWD) and with the Group-2 roads PPC consulting team which will be required especially for Task 1, it is expected that the consultant's key EIA personnel will either be based in Aizawl or will be available to travel regularly to Aizawl on a schedule to be agreed with PWD during the inception phase, at the consultant's expense.

### **Client's obligation**

The client (PWD) will provide access to all available information relevant to the task, including access to draft deliverables and interim reports of the PPC consultants for completion of Task 1. The client will also provide logistical and coordination assistance to ensure the timely flow of information and documents across consulting teams (including principally with the PPC consulting team), and will ensure that the consultant has access to relevant personnel in the PPC consulting team, officials and technical staff at PWD and at other government agencies and departments as necessary. The client will make available existing PWD field offices and facilities in the project area, etc. and will help in organizing consultation events and workshops, such as in issuing invitations and event announcements, and also in organizing formal presentations by the consultant on draft and final deliverables.

The Client will designate an officer to act as the main liaison officer and participate to the extent possible in the tasks under the consultancy.

### **Estimated time requirements for key personnel**

For budgeting purposes, the following table provides an initial / high-level estimate of the expected time inputs required for the core team members. This does not include time to be required of supporting team members as deemed necessary by the consultant. The consultant should use this as rough guidance only, to propose a specific fee for the assignment, which should be inclusive of all staff time including from supporting staff, as well as anticipated costs for travel, field expenses, consultations and workshops, etc.

<b>Team member</b>	<b>Months</b>
Team leader cum Environment Specialist	8
EIA specialist	6
Senior Biodiversity Specialist	4
Biodiversity specialist / Ecologist	6
GIS expert	4

**Annex A: Preliminary list of relevant resources**

1. Flora of Mizoram , Botanical survey of India , Ministry of Environment and Forest , Government of India
2. Fauna of Mizoram, Zoological Survey of India , Ministry of Environment and Forest , Government of India
3. North East India Tourism – Mizoram Documents
4. Plants of Mizoram (including wild animals and birds)– by M.Swamlina
5. Important Bird Areas in India – Mizoram IBCN (Indian Bird conservation Net work)
6. Natural Resource Management – Mizoram – L.K.Jha , APH Publishing House New Delhi
7. National Biodiversity Strategy Action Plan (NBSAP) – Mizoram , Department of Forest Government of Mizoram
8. Review of Biodiversity in North East India – WWF india , New Delhi
9. *Biodiversity significance of Northeast India. Working paper prepared for the World Bank and Ministry of Development of the Northeastern Region (MODONER)*, Government of India.
10. SBSAP (State Biodiversity Strategy and Action Plan Reports) for Mizoram
11. Indian biodiversity portal , Checklist of Mammals of Mizoram
12. Resource and Biodiversity Base Mizoram – ENVIS Centre on Ecotourism ,government of SIKIM
13. Seminar proceeding of “Environment, Biodiversity, Veda and Traditional Systems” at Mizoram, University
14. Website: IUCN (2009). IUCN IUCN Red list of threatened Species [www.Iucnredlist.org](http://www.Iucnredlist.org)
15. Fish Fauna of Major rivers in Mizoram – Department of Fisheries , Government of Mizoram
16. Mizoram State Forestry Action Plan for 1997 – 2017.
17. Mizoram State biodiversity Strategy and action plan, 2003.
18. Mizoram State action plan on climate change 2010.

## **Annex B: PPC Terms of Reference for Environmental Assessment for Group II roads**

### **Detailed Specifications for Environmental Assessment and Environmental Management Plan**

#### **Background**

- Environment Assessment (EA) process is a decision-making tool to ensure that the project design and implementation are environmentally sound and sustainable. During the preparation phase, the objective of the EA is to provide inputs to the feasibility study; preliminary and detailed design of the project. During the implementation phase, environmental management plans (developed as a part of the EA during the preparation phase) serve as a framework for executing the mitigation, enhancement and monitoring measures.
- In the preparation phase, the EA shall achieve the following objectives:
  - ❖ To establish the environmental baseline in the study area, and to identify any significant environmental issue;
  - ❖ To assess these impacts and provide for measures to address the adverse impacts by the provision of the requisite avoidance, mitigation and compensation measures;
  - ❖ To integrate the environmental issues in the project planning and design;
  - ❖ To develop appropriate management plans for implementing, monitoring and reporting of the environmental mitigation and enhancement measures suggested.
- The environmental assessment studies and reporting requirements to be undertaken under these TOR must conform to the GOI and the Bank guidelines and regulations, which comprise of, inter alia: The Environmental Impact Assessment Notification, MOEF, 1994 with subsequent amendments; Environmental Guidelines for Rail/Road/Highway Projects, MOEF, 1989; the operational policies, guidelines and the reference materials of the World Bank listed in Annex I.
- The EA comprises the following stages – environmental screening, project EA and the EMPs. The following section gives the detailed scope of work in each of these stages. The environmental screening and environmental scoping will be done by the PWD prior to commissioning EA works by the consultant. Environmental scoping will finalize the ToR, which will provide comprehensive guidance with regard to project relevant environmental issues, influence areas, methodology (for baseline information collection and analysis, impact prediction and assessment, designing mitigation measures, consultations etc). Consultant will prepare the EA and EMP based on the final/ updated ToR.

#### **(i) Environment Screening**

- Environment screening is done in the early stages of the project preparation to make a preliminary assessment/review of the environment issues/ risks that are relevant to the proposed project, to determine the level of environmental investigation needed and to flag obvious environmental issues so that the project starts considering them early on, hence helping the project to become environmentally sound and sustainable. It determines the appropriate extent and type of project EA to undertake, provides information/input that are required for assessing technical, economic and financial feasibility of the project, and recommends possible modifications in the preliminary project design.
- Environmental screening of the proposed project will be done before consultant starts EA activities.

#### **(ii) Environmental Scoping**

- Environmental scoping will be completed by the client prior to starting EA by the consultant. Environmental Scoping will determine the most relevant and specific environmental issues in the proposed project in which the EA will have to focus. The scoping will determine the influence area/

define boundaries of the project EA and provide guidance on the methodology to be followed. This will result an updated and comprehensive ToR, which consultant will follow in doing the EA of the proposed project. The scoping shall include the priority or most significant issues/ subjects that will be covered in the project EA along with the “how, when and where” of each activity recommended. It shall include a listing of other environment issues that may not deserve a detailed examination in the project EA along with a justification. The scoping will identify and describe the specific deviations or inclusions vis-à-vis the original ToR, if any, along with a justification; modify the ToR for the project EA, if required; and recommend studies that need to be conducted in parallel but are outside the purview of the EA process.

***(iii) Detailed Environmental Assessment (EA) of the Proposed Project.***

- Project EA is the stage when the detailed assessments are done. This includes carrying out the detailed EA and preparing various reports that include the detailed EA report and environment management plans (EMPs). Consultant will carry out detailed Environmental Assessment (EA) of the proposed project based on the detailed ToR revised/finalized by the client through Environmental Scoping described earlier.
- The work plans and methods employed shall be as per those described in the Scoping Report and further detailed/ modified in the approved Inception Report and/or as agreed during the inception process. It is recommended that the environmental surveys be co-ordinated with the social and engineering surveys, as far as practical.
- General ToR and scope of the EA work are described below.

**Objective of Project EA.** The objectives of the EA study are to:

- Collect baseline data on environmental condition of the project influence/ impact area
- Identify environmental impacts in terms of magnitude, extent and duration that may be expected to occur during construction and operation
- Identify the critical environmental problems that require further studies and/or monitoring.
- Carry out alternative analyses from the environmental point of view including "No Project Alternative" (or with and without project comparison)
- Suggest mitigation measures for the adverse impacts and enhancement measures for the beneficial impacts
- Develop Environmental Management and Monitoring Plan Assess the institutional arrangements and capacity for the implementation of Environmental Management and Monitoring Plan, and suggest capacity strengthening measures, if necessary.
- Develop information dissemination and consultation strategy for the implementation of the environmental mitigations and enhancement measures during project implementation
- Consult and inform the project affected people, parties and other stakeholders, and ensure active people's participation
- Advise decision makers regarding the environmental implications of the project

**Scope of EA, tasks and methodology**

- The EA Study shall be carried out following the provisions of the relevant national acts, policies, guidelines published by the Government of India (GoI) as well as World Bank's policy and guidelines. Relevant international conventions to which the GoI is a signatory should also be taken into account while doing the study.
- Broadly, the scope of works includes: (i) information and data collection from secondary sources, (ii) Site surveys to collect primary data/ information from the influence/impact area, (iii) consultations with the project affected people, parties and stakeholders, (iv) review and analysis of

the collected data/ information, (iv) make presentations of the findings to various stakeholders and to the client, and to the authorities that issue clearances, (v) designing appropriate mitigations measures and share this with the technical team, (vi) preparation of relevant reports including Consultation Report, and EA Report, and (vii) support client in translation and disclosure of relevant environmental documents.

- The Project EA will cover all physical, biological and social & cultural aspects as relevant to the project and its influence/ impact areas. More specifically consultant will:

**(i) Literature Review:**

- The available published literature, documents and maps (topographic maps, land use maps, aerial photographs, google image etc.) related to the project shall be reviewed. The Scoping Report prepared by the client shall be reviewed thoroughly. Existing environmental policies, legislation and guidelines of GoI related to roads & highways, and World Bank's EA policies and guidelines shall be reviewed and documented for the preparation of EIA report. In addition, a series of consultations to get updated information on project development shall be made with the technical team that is undertaking the updated feasibility study of the project.
- In order to crosscheck the local information, official of the local and district level particularly related to forest & wildlife, geology/ slope stability/ erosion, archaeology/ heritage, aquatic life, conservation area etc shall be contacted to solicit specific and relevant information. The consultants will collect information from secondary sources that are relevant to understanding the environmental baseline as pertaining to physical, biological and socio-cultural environments. The following type of data shall be collected through literature review:
  - *physical environment* (e.g. spots of risks of slope stability, landslides, erosion etc; unique features rocks/ falls, rivers/ water sources, land uses etc)
  - *biological Environment* (e.g. forest, wildlife, conservation/ protected area, wildlife habitat & movement, aquatic life, bio-diversity, endangered/ rare/ protected species of flora and fauna etc)
  - *social and cultural environment* (e.g. special/ distinct community and their culture, their linkages with nature for livelihood and culture, physical cultural/ religious/ historic sites, archaeological sites, etc. This needs to be closely coordinated with social assessment).

**(ii) Review of legislative and regulatory requirements:** The Consultant shall collect and review various prevailing environmental policies, acts, regulations, guidelines, conventions and standards so as to carry out the project EA in conformity to these. This will confirm the applicable requirements. Review shall include, but not limited to, the following:

- Acts and Rules/Regulations
- Guidelines
- International Conventions
- Standards
- World Bank Group's Policies and Guidelines (e.g. Policies, Procedures and Guidelines on Environmental Assessment including Annexes, OP/BP/GP 4.01; Policies, Procedures and Guidelines on Environmental Action Plans, OP/BP/GP 4.02; Policies, Procedures and Guidelines on Natural Habitats and Biological diversity, OP/BP/GP 4.04; Policies, Procedures and Guidelines on Involuntary Resettlement, OP/BP/GP 4.12; Policies, Procedures and Guidelines on Cultural property (Safeguarding Cultural Property in World Bank-Financed Projects), OP 4.11; Policies, Procedures and Guidelines on Indigenous Peoples, OP/BP/GP 4.10).
- Field Survey/ Investigation
- A team of multi disciplinary experts shall carry out the field study to collect the baseline information on physical, biological socio-economic and cultural environment of the project area.

The consultant will propose detailed methodology, based on the guidance provided in the Scoping Report, for each of the field data collection and agree before conducting field works. The information /data will cover

- *Physical Environment*
- *Biological Environment*
- *Socio-Economic and cultural environment*
- The Consultant will carry out filed survey / investigations of all the environmentally sensitive locations (identified during Scoping and during inception ) and document them on the base maps to identify conflict points with preliminary designs (including verification of these from authentic sources of information, such as from the revenue and forest records); and prepare detailed specific maps showing details of candidate sites for environmental enhancements.
- All surveys shall be carried out in compliance with the GoI standards/guidelines/norms. Wherever such guidelines/norms are not available, the techniques, tools and samples employed for the surveys shall conform to the best international practices. Whenever directly relevant secondary data is available, these should be used, while indirectly relevant data should be verified through primary survey. Environmental parameter (air, water and noise) monitoring surveys shall include an adequate number of samples, as established on a sampling network, so as to provide a representative sample of the entire project corridor. Additional sample data for sensitive environmental/ecological receptors, if any, shall be collected such as to analyze and predict the possible impacts to a degree and precision of acceptable professional standards. Further, additional specialized surveys, such as biodiversity assessment survey, and hydrological surveys shall be conducted depending upon the context and complexity of the project setting. The methods and extent of survey will be defined in the consultant's EA Inception Report and agreed upon before mobilizing the field survey team.

***(iii) Data analysis and Results***

- The primary and secondary information shall be analyzed qualitatively and quantitatively. The emphasis of the analysis shall be to establish relationships between environmental changes (issues and alternatives) with or without the proposed project. The differences detected by the analysis, field observation and circumstantial evidences shall form the basis for recommending and designing the environmental enhancement and mitigation measures, monitoring and evaluation schemes, and management plan.

***(iv) Consultation***

- The consultants shall undertake community consultation sessions at the state, district, village and roadside community levels, as per the consultation plan prepared during the Inception Stage. Consultations should be carried out with all relevant stakeholders identified through stakeholder analysis. The objective of the consultation sessions shall be to improve the project's interventions with regard to environmental management. At least two rounds of consultations shall be carried out – the first to seek views from the stakeholders on the environmental issues and the ways these could be resolved, and the second to provide feedback to the stakeholders that their views have been taken care in the project (when the draft EA/ EMPs are completed). Further, the residual feedbacks received shall be analysed, and the consultants shall determine how these can be addressed in the final EA/ EMP and in the project designs
- While conducting the EIA study, consultation shall be carried out to involve the public in all the activities carried out in the project area. The local people shall be involved from the initial phase of EA study. While doing consultation, both directly and indirectly affected people shall be consulted and focus group discussion shall be conducted separately targeting different categories of affected people, communities and stakeholders. The consultant will prepare a brochure, in local language (easy to understand), containing adequate information about the project components and activities

that could result adverse impacts: the brochure should be distributed and the project explained before discussing potential environmental risks and concerns.

- During field survey/investigation, group discussions shall be conducted with local, state, and district level government offices, local institutions (NGOs, CBOs, local clubs/groups, Women Group, Village Councils), representatives from the affected settlements and local residents in the project affected villages. Information will be shared and feedback on issues, concerns and suggestions for mitigations will be obtained. Each focus groups discussions will be separately documented.
- After the completion of the EIA Draft report, Public Consultation Meeting shall be conducted at the project sites accessible to local people to share the findings of the assessment, explain how the concerns have been incorporated, to obtain further feedbacks from the affected people & stakeholders; to determine local perception about the project; and to ascertain local development needs and potentials. Public Notice shall be published in a national daily newspaper about the time and place of the public consultation meeting. Furthermore, the notice shall be circulated to concerned local stakeholders prior to this public consultation meeting. The findings of the assessment will also be presented to district level stakeholders and state level stakeholders.

**(v) *Environmental baseline***

- The consultant will, identifying the sensitive and project relevant environmental components, analyse the data/ information and establish environmental baseline of the project influence area/ potential impact zones. The baseline will describe current condition, without project risks/ pressure/ challenges, and trend of changes that have occurred over a reasonable period of time as well as likely future changes that might take place in the without project scenario.

**(vi) *Determination of potential impacts of proposed project.***

- Impact identification, prediction & assessment: The consultants shall determine the potential impacts adverse and beneficial impacts due to the project through identification, analysis and evaluation of the project activities and environmental baseline/ situation (focusing on sensitive areas -natural habitats; sites of historic, cultural and conservation importance, landslide/ erosion risk etc), urban settlements and villages/agricultural areas etc. The identified impacts will be predicted and their significance assessed based on the scale/extent, severity, and temporal aspects. Distinction will be made between significant positive and negative impacts, direct and indirect impacts, immediate and long-term impacts, and unavoidable or irreversible impacts.

**(vii) Environmental Mitigation & Enhancement Measures, and Environmental Management Plan:**

- For each impact assessed as significant, feasible and cost effective mitigation measures shall be identified to reduce potentially significant adverse environmental impacts to acceptable levels. The capital and recurrent costs of the measures, and institutional, training and monitoring requirements to effectively implement these measures shall be determined. The consultants shall explore and recommend different environmental enhancements including roadside landscaping, separation of non-motorized lanes in an aesthetically appealing manner, provision of pilgrimage pathways, and development of cultural properties or improving access along the corridor. At this stage, it would be important to identify the need for further environmental studies for issues that cannot be dealt with during the project preparation stage, but should be undertaken during project implementation.
- Environmental Management Plan - Based on the environmental impacts predicted, EMPs, separate for each of the construction contract packages, shall be prepared in such a manner that these are amenable to incorporation in the bidding/contract documents. The EMP shall be prepared as per the requirements of World Bank OP 4.01- Annex C; and shall, among others, include a list of design

modifications recommended by the project EA, along with the chainage. The EMP will be revised in *consideration of the comments of the Client and the World Bank.*

- Apart from mitigation of the potential adverse impacts on the environmental components, the EMP shall identify opportunities that exist for the enhancement of the environmental quality along the corridor. This shall include the enhancement of specific locations as water bodies, enhancement of scenic areas along the corridor. Residual impacts from the environmental measures shall also be clearly identified. The EMP shall include specific or sample plans, such as for management and redevelopment of quarries, borrow areas and construction camps. The EMP shall include detailed specification, bill of quantities, execution drawings and contracting procedures for execution of the environmental mitigation and enhancement measures suggested, separate for pre-construction, construction and operation periods. In addition, the EMP shall include good practice guides related to construction and upkeep of plant and machinery. Responsibilities for execution and supervision of each of the mitigation and enhancement measures shall be specified in the EMP. A plan for continued consultation to be conducted during implementation stage of the project shall also be appended
- The EMP shall list all mandatory government clearance conditions, and the status of procuring clearances. Additionally, the EMPs shall include as separate Annexes, if applicable, Natural Habitat Plan and/or Cultural Properties Plan to satisfy the requirements of the World Bank safeguard policies.

***(viii) Alternative Analysis***

- This shall primarily comprise of analysing alternatives with respect to routes (including bypasses), alignment, cross-sections, materials and sources of materials from an environment management perspective. This analysis shall also cover comparisons in relation to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Alternative analysis of the project for location, design, technology selection, construction techniques, environmental management systems and risks shall be carried out. Alternative analyses shall be compared in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. While describing the impacts that are irreversible or unavoidable and can be mitigated shall be indicated. To the extent possible, costs and benefits of each alternative, incorporating the estimated costs of any associated mitigating measures shall be quantified. "No Project Alternative" of not constructing the project shall be included, in order to demonstrate environmental conditions without it.

***(ix) Institutional and Capacity Assessment***

- The consultant will review the existing capacity and institutional mechanism in PWD and other institution that might be involved in the role of environmental management, e.g. in monitoring, in the proposed project) for environmental management. The capacity assessment for environmental management will lead to the designing of capacity strengthening measures and plans, as well as recommendations for improved and streamlined approach in environmental management and due diligence. The consultant shall recommend institutional arrangement to manage environment impacts effectively. This may extend to new agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance, training and budgeting. A specific description of institutional arrangements including the responsibility for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training) shall be provided in the EA/ EMP. To support timely and effective implementation of environmental programs and mitigation measures, the EA/EMP shall illustrates the existence, role, and capability of

environmental expertise of the proponent (PWD). If necessary, training of staff for strengthening the environmental management capability of the responsible agencies to augment the implementation of EIA recommendations shall be recommended.

- **Capacity Building & Training:** The EA/ EMP shall describe the implementation arrangement needed for the project, especially the capacity building proposals including the staffing of the environment unit (as and when recommended) adequate to implement the environmental mitigation and enhancement measures. For each staff position recommended to be created, detailed job responsibilities shall be defined. Equipment and resources required for the environment unit shall be specified, and bill of quantities prepared. A training plan and schedule shall be prepared specifying the target groups for individual training programmes, the content and mode of training. Training plans shall normally be made for the client agency (including the environmental unit), the supervision consultants and the contractors.
- **Supervision & Monitoring:** The EA/EMP shall specify the environmental supervision, monitoring and auditing requirements. The monitoring programme shall specify parameters, reference standards, monitoring methods, frequency, duration, location, reporting responsibilities, and what other inputs (e.g., training) are necessary. In addition, the program will specify what action should be taken and by whom in the event that the proposed mitigation measures fail, either partially or totally, to achieve the level of environmental protection expected.

**(x) Integration of EA/ EMP with Project (Environmental inputs to feasibility study & project design)**

- The Consultants shall discuss and co-ordinate with the engineering and social consultants, the findings and recommendations of the project EA in a continuous manner. The EA consultants shall have close interactions with the technical engineering team as assessment proceeds sharing/ communicating/ advising on the potential environmental issues and mitigations as they emerge. The EA Consultant shall make location-specific design recommendations, wherever possible or required, related to alignment (major/minor shifts or bypasses or altogether different route alternative), road cross-sections, construction material use, and mitigation & enhancement measures. For all the different alternative improvement or mitigation proposals under consideration, using acceptable/established valuation techniques, the consultants shall prepare {a} an estimate of economic costs of the environment damage, and economic benefits from the direct positive impacts that the project is likely to cause, and {b} an estimate of financial cost on the mitigation and enhancement measures that the project is likely to require, and financial benefits, if any. The EA consultants shall consult with the engineering consultants and familiarize themselves with the project's overall feasibility analyses models, so that the EA inputs are in conformity to the needs of the overall feasibility study. For example, the environmental cost and benefit stream estimation should cover the lifetime of the project, by each unit road-section analogous to the unit road-sections used in the engineering analysis. In addition, wherever economic and financial costs of the environmental impacts cannot be satisfactorily estimated, or in the cases of significant irreversible environmental impacts, the consultants shall make recommendations to avoid generating such impacts.
- **Coordination among the engineering, social & Environmental Consultants** - The consultants, with assistance from the client, shall establish a strong co-ordination mechanism with the other project-preparation consultants – engineering, social and/or institutional development. The consultants shall keep in mind the specific requirements of the project in general, and the engineering/design studies in particular, and plan their outputs accordingly. See Figure 1 for a generic inter-linkage among the engineering, social and environmental consultants' activities and output. The consultants shall detail out in the Inception Report, how the required inputs would be provided to the other consultants in a timely manner.

- It is recommended that some of the consultation sessions may be organised in co-ordination with the social and engineering consultants, as feasible, and when the stakeholders consulted are the same.
- The Consultants shall make formal presentations, co-ordinated by the client, at key milestones on the (a) proposed work plan after submitting the Inception Report; (b) recommendations from the environmental analysis; and (c) details of EMP and design recommendations. The consultants shall co-ordinate with the engineering, social and/or institutional development consultants at each of these formal presentations.

***(xi) Other Assistance to the Client***

- The Consultants shall support the client to furnish any relevant information required for obtaining clearance from various state and central government agencies. This may include {a} assisting the client in the submission of application for the Clearance of Reserved or Protected Forests to the Forest Departments; {b} completion of forms and submission of the same for obtaining No-objection Certificates (NoC) under the Water and Air Acts from the State Pollution Control Boards; {c} completion and submission of the MoEF questionnaire for Environmental Appraisal for the project; {d} assistance in presentation to the Wildlife Board of the MoEF in obtaining clearance for the section of the corridor passing through the Wildlife Reserves or Sanctuaries or other protected areas, if any; {e} assistance in submission for any other clearance requirements with respect to the environmental components relevant to the project.
- **Public Disclosure** - The Consultant is to provide support and assistance to the client in meeting the World Bank's disclosure requirements. The consultants will prepare a plan for in-country disclosure, specifying the timing and locations; translate the key documents, such as the EA Summary in local language; draft the newspaper announcements for disclosure; and help the client to place all the EA reports in the client's website. The consultants shall prepare a non-technical EA Summary Report for public disclosure.
- **Training of Client's Staff** - The consultants shall conduct training for the client at various levels. This is to ensure that the knowledge, skills and perspectives gained by the consultants is transferred to the client so that these can be utilized effectively during project implementation. Here again, the training should be focused on the EMPs covering both central and field offices.
- The Consultants shall develop a plan for training the client's staff. This plan should specify the types of training, the participants for each training type, the number of sessions required, the duration of each session and when it should be conducted. At the end of the training, when the EMPs are ready, brief reports shall be prepared on the training conducted and observations relevant for future training, if any.

***(xii) Deliverables***

- The Consultant will deliver the following outputs;
  - a. An Inception Report** detailing interpretation of ToR; a detailed work plan including methodology, a detailed table of content of the EA and EMP. The inception report will be discussed with and cleared by the client.
- The Consultants shall use the inception period to familiarize with the project details. The Consultants shall recognize that the remaining aspects of the project, such as engineering and social, are being studied in parallel, and it is important for these aspects to be incorporated. The Consultants should also recognize that due care and diligence planned during the inception stage helps in improving the timing and quality of the EA reports.

- During the inception period the Consultants shall (a) study the project information to appreciate the context within which the EA should be carried-out, (b) identify the sources of secondary information on the project, on similar projects and on the project area, (c) select sample corridors based on simple criteria and carry out a reconnaissance survey, and (d) undertake preliminary consultations with selected stakeholders.
- Following the site visits and stakeholder consultations, as well as a review of the conditions of contract between the consultant and the Client, the consultant shall analyse the adequacy of the allocated manpower, time and budgets and shall clearly bring out major/minor deviations, if any. The Consultants shall study the various available surveys, techniques, models and software in order to determine what would be the most appropriate in the context of this project.
- The Consultants shall interact with the engineering and social consultants to determine how the EA work fits into the overall project preparation/ project cycle; how overlapping areas are to be jointly addressed; and to appropriately plan the timing of the deliverables of the EA process. These shall be succinctly documented in the Inception Report.

**b. Environmental Analysis Report.** An Environmental Analysis Report will be prepared, upon completion of the field work, summarizing the main findings from the review of secondary information and site visits to highlight the main environmental issues of concerns that the project has to address.

- This will present a *preliminary* analysis of the nature, scale and magnitude of the impacts that the project is likely to cause on the environment, especially on the identified sensitive or valued environmental component, and classify the same using established methods. For the negative impacts identified, alternative mitigation/management options shall be examined, and the most appropriate ones suggested. For the positive measures identified, alternative and preferred enhancement measures shall be proposed. This will ensure timely communication of emerging suggestion to the technical engineering team.
- The Consultants shall keep in mind the particular requirements of the project, especially the needs of the overall feasibility studies in carrying out the environmental analysis.
- The consultants shall indicate the environmentally sensitive locations on and along the project road, as well as within the project's influence area. All regionally or nationally recognised environmental resources and features within the project's influence area shall be clearly identified, and studies in relation to the proposed scope of the project. Typically, these will include stretches of roadside trees; environmental and common property resources such as forests, large water bodies; and major physical cultural properties. All these may be depicted using a line diagram or a strip map.
- The consultants shall determine the sensitive or valued environmental components considering the baseline information (from both secondary and primary sources), the preliminary understanding of the activities proposed in the project and, most importantly, the stakeholder consultations. [VEC is defined as social or biophysical component of an environment which is of value (for any reason) in a project influence area – for further details see The World Bank, Roads and Environment, A Handbook (World Bank Technical Paper No. 376), Washington DC, 1997 (pp 25)].
- Preliminary Analysis of Impacts and Management Measures: The consultants shall conduct a preliminary analysis of the nature, scale and magnitude of the impacts that the project is likely to cause on the environment, especially on the identified VECs, and classify the same using established methods. For the negative impacts identified, alternative mitigation/management options shall be examined, and the most appropriate ones suggested. For the positive measures identified, alternative and preferred enhancement measures shall be proposed.

**c. A Consultation Report**, covering all consultations types conducted/undertaken in the process of this assignment. The report needs to explain methodology/ types of consultations carried out, key data (such as type of meeting, stakeholder group type, number of participants, date, photographs etc); key points/ issues that emerged from the meetings/ consultations and how these are/will be addressed in the project, and separate proceedings for each formal workshop(s).

**d. A Draft EA Report**, containing baseline assessment, impact assessment, EMP, analysis of policies and legislation, instructional arrangement and capacity building, monitoring and supervision, consultation framework, and necessary guidelines and code of practices in line with the table of content agreed in the inception report. Initial draft EA Report (including EMP) will be discussed with client. The draft EA Report will be disclosed and consulted with affected people, parties and stakeholders through meeting/ workshop/ hearing.

**e. Final EA Report** including EMP, incorporating the comments from client, world bank and feedbacks received from affected people and stakeholders.

**f.** Write up for Project Implementation Manual (PIM) and clauses, standards and/ or specifications for bidding documents.

**g.** Draft MoUs between Client and Other Relevant Participating Line Agencies; Assistance to Client for Environment Clearance Application Forms, and any other outputs as required for satisfactory completion of this assignment.

**Content of EA Report.** Detailed content of the EA Report will be finalized by the Scoping Report prepared by the client. Broadly the EA Content will include the following.

- Executive Summary: (English and Local Language)
- Policy, legal and administrative framework.
- Project description.
- Baseline data.
- Environmental Impact.
- Analysis of alternatives.
- Environmental Management Plan (EMP). This will contain Mitigation, Monitoring, Capacity Development and Training, Implementation Schedule and Cost Estimates, Integration of EMP with Project.
- Appendixes (List of EA report preparers, references, record of consultation meetings, data tables,, list of associated reports etc)

### **Description of the Project**

The first project road will start from NH 44A junction (Latitude 23degree 48'10";Longitude 92degree 34'49.72"E) to Buarpui (Latitude 23degree 16'46.15"; Longitude 92degree 39'13.86"E) an then to Zawlpui (Latitude 23degree 2'18.03" :Longitude 92degree 34'49.72"E). The second project road will start from Zawlpui (Latitude 23degree 2'18.03" :Longitude 92degree 34'49.72"E). to Phairuankai (Latitude 22degree 49'25.63"N; Longitude 92degree 38'21.7"E) and then from Chawngte (Latitude 22degree 27'7.81"N ; Longitude 92degree 38'9.56"E) to Bungtlang south (Latitude 22degree 21'34.17"N; Longitude 92degree 45'33.57"E) up to Multi Modal road junction. About 20% to 25 % of the project road will pass through new alignment and the rest will follow existing road. The civil works will consist of improvement and upgradation of existing roads and construction of new road, pavement construction, side drain, culverts, slope protection works etc. The formation width will be 12mand pavement width 7m .

## Consultants' Input

- The Consultant is free to employ resources as they see fit. Time is an important essence for the study, which shall be closely co-ordinated with the works of the engineering and social teams, simultaneously involved in preparation of the project. Estimated total input 16 man-months.
- Additional expertise, such as on hill ecology or other, shall be provided as demanded by the context of the project. The consultants are encouraged to visit the project area and familiarise themselves, at their own cost, before submitting the proposal; and propose an adequate number and skill-set for the senior specialists and technical support staff for this assignment. Further, the consultant will allocate adequate number of field surveyors, distinct from the technical support staff, to complete the study in time.
- The Consultants shall provide for all tools, models, software, hardware and supplies, as required to complete the assignment satisfactorily. These should be widely recognised or accepted. Any new model or tool or software employed should be field-tested before use for the purpose of this EA.
- All supporting information gathered by the consultant in undertaking these terms of reference would be made available to the client.

## Outputs

- The Consultant is expected to provide the following outputs, as per the schedule given. The Consultant is expected to allocate resources, such as for surveys, keeping this output schedule in mind. *(Modify based on the number specified in, and schedule of outputs of the Engineering ToR).*

<b>Phase 1 : (Junction NH44A (Origination) – Chungtlang – Darlung – Buarpui)</b>		
<b>Item</b>	<b>No</b>	<b>Due date</b>
(1) Inception Report	6	Within 1 month from Start Date
(2) Report and Presentation to Client: Complete LIDAR suveys	1	3 month from Start Date
(3) Presentation to Client: Draft Detail DPR, Environmental Assesement(EA), Environmental management Plan(EMP), Resettlement Action Plan(RAP) and Social Assesement.	3	4 months from Start Date
(4) Presentation to the Client Draft Bids document	3	5 months from Start Date
(5)Completion of Consultation on Draft EA,Social Assesement	3	5 months from Start Date
(6)Final Detail Project Report(DPR),Environmental Assesement(EA),Environmental management Plan(EMP), Resettlement Action Plan(RAP),Social Assesement	3	7 months from Start Date
(7) Presentation to the Client: Completion Report of Final Bids document	6	7 months from Start Date
(8) Draft MoUs between Client and Other Relevant Participating Line Agencies; Assistance to Client for Environment Clearance Application Forms, and any other outputs as required for satisfactory completion of this assignment including Presentation to MOEF for Environmental clearance .	1	8 months from Start Date

<b>Phase II: ( Buarpui – Thenlum – Zawlpui )</b>		
<b>Item</b>	<b>No</b>	<b>Due date</b>
(1) Inception Report	6	Within 1 month from commencement of Phase II
(2) Report and Presentation to Client: Complete LIDAR suveys	1	3 months from commencement of Phase II
(3) Presentation to Client: Draft Detail DPR, Environmental Assesement(EA), Environmental management Plan(EMP), Resettlement Action Plan(RAP) and Social Assesement.	3	5 months from commencement of Phase II
(4) Presentation to the Client Draft Bids document	3	6 months from commencement of Phase II
(5) Completion of Consultation on Draft EA,Social Assesement	3	6 months from commencement of Phase II
(6)Final Detail Project Report(DPR),Environmental Assesement(EA),Environmental management Plan(EMP), Resettlement Action Plan(RAP),Social Assesement	3	8 months from commencement of Phase II
(7) Presentation to the Client: Completion Report of Final Bids document	6	8 months from commencement of Phase II
(8) Draft MoUs between Client and Other Relevant Participating Line Agencies; Assistance to Client for Environment Clearance Application Forms, and any other outputs as required for satisfactory completion of this assignment including Presentation to MOEF for Environmental clearance ..	1	10 months from commencement of Phase II

### **Inputs to be provided by the client**

- The client can provide office space as necessary. The client will provide no other logistic support. It is expected that the Client and the field offices will provide all ready and available information as requested by the consultant. Further, the Client will provide all necessary and reasonable support to the consultant to collect secondary data, such as issuing authorisation letters. The Consultant will be responsible for any translation of documents and for processing of data. The Clients will designate an officer to act as the main liaison officer and participate as possible in the study.
- The client may designate/depute a team of professionals to work within the consultants’ team for long-term capacity building within the client’s organisation.
- The client will ensure the timely flow of information and documents from one consultant to other. The client will also help in organising the formal presentations from all consultants engaged in project preparation.
- A separate guidance note or scoping note on the suggested contents of the Environment Analysis, Project EA, EMP and Summary EA Reports will be provided by the client.

## **List of Annexes**

- The following Annexure provide useful information and guidelines for the assignment:
  - ❖ Annex IVA - List of the World Bank Operational Policies and Directives

## **Annex 4A**

### **List of the World bank Operational Policies and Guidelines**

#### **Operational Policies (OP) /Bank Practices (BP) /Good Practices (GP) / Operational Directives (OD) / Guidelines**

- ❖ OP / BP / 4.01 Environmental Assessment
- ❖ OP / BP / GP 4.02 Environmental Action Plans
- ❖ OP / BP / GP 4.04 Natural Habitats
- ❖ OP / BP 4.12 Involuntary Settlement
- ❖ OD 4.10 Indigenous Peoples
- ❖ BP 17.50 Disclosure of Operational Information
- ❖ OP/BP 4.11 Physical Cultural Resources
- ❖ OP/BP 4.36 Forests

#### **Reference Material**

- ❖ The World Bank, Environment Department, Environment Assessment Sourcebook, Vol. I – III (World Bank Technical Papers No. 139, 140 and 154), Washington DC, 1991; and its updates. (Refer to [www.worldbank.org](http://www.worldbank.org)).
- ❖ The World Bank, Roads and Environment, A Handbook (World Bank Technical Paper No. 376), Washington DC, 1997.
- ❖ The World Bank, Resettlement Sourcebook
- ❖ Environmental Health and Safety Guidelines (IFC World Bank Group).

FIGURE 1: TYPICAL INTERFACES AMONG THE ENVIRONMENTAL ASSESSMENT, SOCIAL ASSESSMENT & THE OVERALL (ENGINEERING) PROJECT PREPARATION

