

Draft Terms of Reference for Hiring of an agency for capacity building and developing land use and land cover maps for 400 villages to support the implementation of the Meghalaya Community Led Landscapes Management Project (MCLLMP) under MBMA

I. Background, Project Description & Assignment Objectives

1. The World Bank supported ‘**Community – Led Landscape Management Project** (CLLMP) aims to strengthen community-led natural resource management based on a landscape approach in Meghalaya. Meghalaya Basin Management Agency (MBMA) is implementing the Project over a period of 5 years from 2018 to 2023. During the project tenure, communities and related institutions, including relevant line departments of the Government of Meghalaya, will be systematically strengthened for improved governance, livelihood promotion and village development through effective natural resource management in the state.
2. The Project will be implemented in approximately 400 villages using a decentralized and participatory approach, with financial autonomy to the Traditional Institutions, the Village Council Dorbar and Village Natural Resources Management Committee (VNRMC) that will be constituted to support the planning and implementation of NRM interventions. There will be a strong focus on institution-building at the village-level, by ensuring systematic capacity-building on technical, managerial and social development skills, including, but not restricted to, resource mapping and data collection, land use planning, project design and monitoring. The Project will also extend such training to communities beyond the targeted project villages and support efforts made by them to access funding from various rural and natural resource initiatives and schemes. Through these processes, the project would ensure convergence of various Centrally and State Sponsored Programs to improve the efficiency of public spending on environmental protection.
3. GIS Land Use Land Cover (LULC), Normalized Differential Vegetation Index (NDVI) and other related maps are a crucial component of the Project to enable communities to visualize their village and plan out interventions appropriately. Therefore, there is an urgent need to prepare the baseline maps for 400 villages and build the capacities of the GIS Staff and other stakeholders of the Project. There is also a need to develop a web GIS tool to enable analysis and monitor changes in LULC
4. A brief project description and proposed activities under the project is included in Annex 1.

II. Objective: The objective of this assignment is:

1. To develop a robust methodology for preparation of GIS Maps and to prepare GIS maps for 400 identified villages under the project at suitable scale, including updating the already prepared maps of 115 villages.
2. To develop and demonstrate a web GIS tool for LULC change monitoring and analysis.
3. To generate maps for delineation of micro catchment area and spring-shed management
4. To train and take-up capacity building of project team.

Scope of work

The Project seeks to build on MBMA's experience of using concepts such as community-driven development and landscape management approach to NRM. These concepts may be relatively new to several stakeholders in this particular project; The Project builds upon the ongoing activities being implemented by MBMA. This task will focus on institutional strengthening that requires the stakeholders to gain a deeper understanding and improve their skills and enhance capacity to be able to deliver the services. (Stakeholders include project functionaries/ primary service providers/non-government organizations/the rural communities etc. at the state, district, sub-divisions and block levels). Therefore, MBMA is seeking to hire an agency or a consortium to undertake activities pertaining to development of a methodology for landscape change analysis and monitoring temporal and spatial land use land cover changes using satellite imagery.

The assignment envisaged is to be undertaken in 4 parts.

Part A would include:

1. LULC and soil maps/ other relevant maps such as NDVI etc of 400 villages (including updating the maps of 115 villages for which LULC maps have already been prepared) using appropriate classification methods and classes, and ground truthing of LULC results, along with estimation of carbon stock of the identified project villages.
2. Generation of relevant maps required for the Project
3. Develop detailed technical training manual and training material
4. Develop high resolution imageries for references and documentation on ground truthing of 10% of villages

Part B entails:

1. Integration of Land Use and Land Cover maps and NDVI maps and other spatial datasets into web GIS platform.

2. Working closely with MIS team in developing interface/API for integration of GIS thematic layers with MIS.

Part C requires:

1. Generating maps to delineate micro catchment areas/spring sheds by developing digital elevation models (DEMs) and slope maps of the project villages.
2. Generating maps on high resolution for the mining affected areas in the Project villages.

Part D would be dedicated to:

1. Organizing training and workshops on quarterly basis on all the various activities undertaken by the agency(including the process of estimating the carbon stock; this will be required so that MBMA can prepare the end maps and have quantitative estimates of various indicators)
2. Providing technical support for 12 months and would also include use of different applications and latest advancements in GIS/Remote sensing tools for natural resource management

The expected outcome of this contract would be, but not limited to, the following activities:

1. Development of robust Land Use and Land Cover (LULC) monitoring analysis methods using various sources of satellite imageries for the project.
2. Preparation of temporal LULC and soil maps of identified 400 villages (including updating the maps of 115 villages for which LULC maps have already been prepared) using standard and appropriate classification methods (Level II classification) using medium to high resolution satellite imageries (10-meter resolution or better). The GIS team of MCLLMP will be provided on the job training by involving them in the preparation of the LULC, soil maps, etc.
3. Preparation of the NDVI maps of the identified 400 villages using medium to high resolution imageries (10-meter resolution or better), and to identify the density of vegetation, deforested, degraded, drought prone areas.
4. Estimation of Carbon stock of 400 CLLMP villages using Remote Sensing and GIS tools and preparing a methodology for replication for the entire State of Meghalaya.
5. Development of methods for accurate assessment of LULC and carryout ground truthing for at least 10% of sampling.
6. Integrating thematic layers of LULC maps and NDVI maps and other spatial datasets into the web GIS platform.

7. Development of technical training manual for the preparation GIS maps medium to high resolution imageries, along with the detailed specifications like scale, methodology and protocols for downloading different imageries, their applications, limitations, etc
8. Organizing trainings in three phases (Phase 1: while developing GIS maps, Phase 2 & 3 while giving technical support)
9. Providing technical support and handholding of the MCLLMP GIS team for periodically updating GIS maps for one year.
10. Generating DEMs, slope maps and micro catchment areas/spring maps.
11. Generating maps on high resolution for the mining affected areas in the Project villages.

The firm should provide details of methodology of integrations of various sources of satellite imageries, methods to produce GIS maps, sources of satellite imageries, techniques used for ground truthing etc. as a part of the inception report (to be detailed in the training manual). The Inception Report should also have a brief chapter on the Software Requirement Study (SRS).

III. Deliverables & Timelines

1. The activities, deliverables expected at the completion of each activity and timelines associated with the expected deliverables is outlined in the table below:

Sl. No.	Activity	Deliverable / Outcome of Activity	Expected Timeline for Deliverables	% Payment of the contract amount
PART A – within 2 months of award of contract				
	Submission of Inception Report and its acceptance by SPMU	Final Inception Report	0.5 months from date of award of contract	10%

Sl. No.	Activity	Deliverable / Outcome of Activity	Expected Timeline for Deliverables	% Payment of the contract amount
	Preparation of GIS maps of 400 villages using appropriate classification methods and classes, and ground truthing of LULC, soil results; Along with estimation of carbon stock of the villages.	Final GIS maps available at SPMU/DPMU	2 months from date of award of contract	20%
PART B – within 4 months of award of contract				
	Integration of GIS maps and other spatial datasets into web GIS platform, along with developing interface / APIs for integration of GIS maps into the MIS	Web GIS platform developed with integrated maps	4 months from date of award of contract	
PART C – within 4 months of award of contract				
	Generate DEM and maps for delineation of micro catchment areas/Spring sheds	Micro catchment areas/Spring shed maps available	Within 120 days from date of award of contract	20%

Sl. No.	Activity	Deliverable / Outcome of Activity	Expected Timeline for Deliverables	% Payment of the contract amount
PART D – from 4 to 12 months to award of contract				
	Development of technical training manual and training material	Technical and training manual and materials developed	within 5 months from the date of award of contract	10%
	Organizing Training and Workshops on a quarterly basis	On the job training during the development phase (120 days) followed by capacity building exercises organize every 3 months for stakeholders	Total of 3 trainings after 120 days	30%
	Provision of technical support to SPMU	Technical support provided for the entire development phase followed by the support for the remaining 8 months.	After 120 days of commencement of the Project, i.e. 8 months	
	Submission of final report of the assignment	Draft report submitted	Within 12 months from date of award of contract	10%

Note: Final deliverables will only be accepted on submission of drafts prior to finalization and discussions around the same. Feedback received from MBMA must necessarily be incorporated in final versions of any deliverable submitted.

IV. Team Composition and Qualification Requirements for the Key Experts

Sl. No.	Position	Area of Specific Expertise desired	Minimum Qualification and Professional Experience desired	Estimated Man Months
1	Key Expert 1: Team leader (1)	Minimum 15 years' experience in leading team/projects, executing/GIS based work, providing trainings, preferably with the state/national government and/or donor agencies in the area of environment and natural resources. Well versed GIS based work. Those having Ph.D. would be preferred	Post Graduate Degree in Natural Resources / GIS / Remote Sensing / Engineering	8
2	Key Expert 2: Geospatial technical expert (2)	Minimum 8 years' experience of working on GIS and Remote Sensing applications in dealing various geospatial aspects, especially in preparation of land use, landcover and natural resources mapping	Post Graduate Degree in Natural Resources GIS / Remote Sensing / Engineering	12 months each
3	Key Expert 3:– Environment and Natural Resource Management Specialist (1)	Minimum 10 years' experience in sustainable natural resource management, integrated approaches such as watershed development, landscape approach, climate change adaptation, conservation of biodiversity; content development and/or designing curriculum/ manuals/ training and learning materials. preference would be given to those well versed in GIS/Remote Sensing.	Post Graduate Degree in Natural Resources / Environment/	6

Sl. No.	Position	Area of Specific Expertise desired	Minimum Qualification and Professional Experience desired	Estimated Man Months
4	Key Expert 4: Training (1)	Minimum 8 years' experience in training methodology and module development. Appropriate and extensive experience in the development of publication-quality training material. Well versed in GIS Training will be preferred.	Post Graduate Degree preferably in the related field.	6
5	Non Key experts			
	GIS expert (7) 1 per district	Minimum 4 years' experience of working on GIS and Remote Sensing applications in dealing various geospatial aspects, especially in preparation of land use, landcover and natural resources mapping	Post Graduate Degree in Natural Resources GIS / Remote Sensing / Engineering or related field	6 months each

Note: Team Leader and members should have in-depth knowledge of participatory NRM and should be from a related educational background. CVs of only key experts (S. No. 1 to 4 in above table) will be evaluated during the technical evaluation stage of the selection process.

V. Consultant's Obligations:

1. The time schedule for the key deliverables from the date of award of contract till completion of Tasks by the Agency is 12 months.
2. Agency is expected to work in the office of the CLLMP and work closely with the State Program Management Unit, District Program Management Unit for Development of GIS database, Training and Capacity Building and other functionaries as delegated by the SPMU.

3. Agency is expected to meet high-quality standards in the production of GIS database, training and capacity building.
4. Agency will have to present their progress to the SPMU as specified in the time schedule or at any time required by the SPMU.

VI. Client’s Input and Counterpart Personnel including Data and Facilities to be provided by the Client

1. The Client will provide CLLMP Project Implementation Plan (PIP), Community Operations Manual (COM), and other relevant documents, under its control and copyright, for reference by the Agency.
2. If and wherever available, the client may provide experiences and data that are under its control and copyright or are made available by partnering organizations (on request) that the MBMA/SPMU has partnered with in the past.
3. The Client may provide at its premises, provide or assign a room to the Agency on request of the latter.
4. Client will provide Workstations and ArcGIS to facilitate generation of maps and layers.
5. The Client will provide conference halls, meeting rooms, rest rooms etc. as may be required during the assignment for the purpose of presentation, submission of reports, workshops, brainstorming sessions and meetings.
6. Personnel of the SPMU, DPMU shall provide necessary inputs to the Agency with prior approval of the Implementing Authority (MBMA/SPMU Chief)

VII. Composition of the Review Committee and Review Procedures to Monitor Consultant Agency’s Work

Chairman:	PD CLLMP
Vice Chairman:	APD CLLMP
Member Secretary:	AGM Knowledge Management
Member:	DPD Project Management
Member:	DPD NRM

The DPD NRM will closely monitor the work of the Consultant Agency’s Work and Task and provide reports of the same. The reports will be reviewed jointly by MBMA and World Bank before providing approval for acceptance.

PROJECT DESCRIPTION

1. The Project Development Objective (PDO) is to strengthen community-led landscapes management in selected landscapes in the state of Meghalaya.
2. The project will provide targeted support to landscape restoration activities in an estimated 400 villages, in prioritized degraded and highly degraded landscapes, of the state. Benefits will accrue to community members from these targeted villages and to surrounding villages through improvement in natural resources, including an increase in availability of water, and enhanced soil productivity.
3. The ultimate beneficiaries of the project are village communities (estimated number not less than 100,000, 50 percent women) in the targeted landscapes that depend on land, forests, water, and agroforestry for their livelihood. In addition, at least five members from each of the 6,026 villages across the state will benefit from training and capacity building and knowledge-sharing activities. Village councils, traditional leaders, local community institutions such as NRM groups, women, and youth will benefit from the project through capacity building, access to knowledge, promotion of innovation, use of technology for decision making and availability of technical, managerial, and financial support for preparation and implementation of CNRM plans. At the global level, benefits will be from the provision of public goods such as reduced greenhouse gas (GHG) emissions, improved hydrological services, and restored habitats for biodiversity.

PDO Level Results Indicators

- **PDO Indicator 1:** Village NRM Committees functioning with adequate fiduciary capacities and capable of monitoring capacities to lead on landscapes management
 - **PDO Indicator 2:** Share of village-level NRM Plans under implementation according to agreed criteria
 - **PDO Indicator 3:** Share of target beneficiaries with rating ‘Satisfied’ or above on process and impact of project interventions (disaggregated by gender)
 - **PDO Indicator 4:** Land area under sustainable landscapes management practices
4. **The project will support and inform the** GoM’s statewide Integrated Basin Development and Livelihood Promotion Programme (IBDLP). The IBDLP has two pillars: (a) Market Access and (b) Landscape Management for Sustainable Natural Resource Management. The Meghalaya Community-led Landscapes Management Project (MCLLMP) aligns with the latter by strengthening communities and traditional institutions to manage natural resources such as land, springs and other water sources,

forests, and biodiversity, through a landscape approach.¹ It will prioritize about 400 villages in ‘very critical’ and ‘critical’ (degraded) landscapes over 5 years for the planning and treatment of these landscapes. Planning and investments will be preceded by training for communities and project management staff at the field level. The project will also extend such training to communities beyond the targeted 400 villages to amplify the reach of the MCLLMP approach to a larger cohort of villages to take up landscape-based management with funds from other government programs.

5. **Participation and leadership of communities in landscape planning and implementation will be central to the project.** A community² will lead the preparation of its own NRM plan to promote integrated NRM including, resource mapping, data collection, land-use planning, project design, and monitoring. A village will be the unit of such plans under the project. From an administrative point of view, each landscape will comprise one or more settlements under a traditional tribal institution (Dorbars, Nokma, and Doloi), typically under a single village council. This approach will also facilitate planning for funds from other government programs for convergence of development programs at the village level.

Component 1: Strengthening Knowledge and Capacity for Natural Resource Management (NRM)

6. The objective of this component is to enable the development, assimilation, analysis, and dissemination of knowledge and skills to improve landscape management within the state. This component will comprise the following subcomponents.

Subcomponent 1A: Promotion of traditional knowledge, grass-root innovations, and communication

7. This subcomponent will support (a) state- and regional-level workshops on sharing of unique and traditional NRM practices, relevant for climate change adaptation such as conservation of indigenous varieties of crops, natural spring rejuvenation etc. and lessons from other NRM projects, (b) development of a knowledge management strategy and web platform for sharing of NRM-related knowledge with the community under the MCLLMP and development of knowledge networks, (c) innovation grants to promote and pilot new approaches to sustainable NRM products and services including low cost approaches to increase climate resilience through agroforestry, climate-smart agriculture and spring-shed conservation and (d) catalytic activities to encourage CNRM in new

¹ There is no single widely accepted definition of this approach. The approach usually refers to decision making to reduce trade-offs between competing land uses (agriculture, forestry, mining, and so on) and multiple livelihood systems in a geographic unit to reduce poverty, increase food production, protect ecosystems, and increase resilience to climate change. The [Ten Principles of Landscape Approach](#) developed through an inter-institutional and intergovernmental process are a useful guide and have also been used to inform the approach in this project. In this project, the agriculture, forest, and other common land and water resources under the jurisdiction of a village is defined as the operational landscape. The terms landscape plan and NRM plans have been used interchangeably. See also Sayer, J, et al. 2013. Proceedings of the National Academy of Sciences, USA. May 2013. vol.110 no.21.

² A community in this case would be defined as a group of households that have rights on the same or adjacent agricultural, forest, or other lands and belong to the same traditional institution (Dorbar Shnong or Chanong) or village and can act together. These are based on the three major ethnic blocks or regions in the state: Khasi Hills, Jaintia Hills, and Garo Hills.

villages. For wider adoption of the MCLLMP approach, the District Project Management Units (DPMUs) will encourage communities that complete the initial training to initiate small activities as a demonstration of their interest to take up larger activities.

Subcomponent 1B: Training and capacity building

8. This subcomponent will finance (a) training and capacity-building activities for all stakeholders and beneficiaries on community leadership and management of natural resources and the approaches promoted by the project, (b) development of training facilities at block level Bharat Nirman Rajiv Gandhi Seva Kendra (BNRGSK)/Enterprise Facilitation Centers, and (c) national and international exposure visits for project stakeholders. These training activities will be implemented in coordination with the Meghalaya Institute of Natural Resource Management, Institute of Governance, Department of Science and Technology, State Institute of Rural Development (SIRD), Forest Training Institute (FTI, Tura) and Conservation Training Institute (CTI) of the Soil and Water Conservation Department.

Subcomponent 1C: Preparation of strategies, research, and development

9. This subcomponent will support consultancy services to develop plans and strategies in the following areas: (a) preparation of strategy and action plan for development of an agency of excellence in knowledge management, innovation, climate change adaptation and communications; (b) institutional development study for the IBDLP; (c) preparation of a training plan for the project; (d) baseline study for the project; (e) study on drivers of deforestation and natural resource degradation; and (f) study on rehabilitation of population displaced due to mines.

Subcomponent 1D: Monitoring, learning, and reporting

This subcomponent will support a management information system (MIS) to cover the entire state for tracking performance and implementation progress of the project. The Meghalaya Basin Management Agency (MBMA) will design and establish MIS infrastructure for the MCLLMP that can be scaled up to cater to other requirements of the IBDLP.

Component 2: Community-led Landscape Planning and Implementation

This component will support both planning and implementation of the landscape plans by communities in the selected very high/high priority areas.

Subcomponent 2A: Preparation of community landscape plans

Communities, with the help of project facilitating teams (subject matter specialists) at block-level and village-level service providers, will prepare plans to (a) optimize synergies between programs and funding streams and (b) plan holistically rather than be driven by sector-specific targets. The Community Operations Manual (COM) will outline processes of community consultation and development of CNRM plans. Plan preparation will be preceded by information sharing and awareness on the project with villages in the priority landscapes, followed by formation of Village NRM Committees (VNRMCs) with operational bank accounts. Funds for

plan preparation will be released to those villages whose Expressions of Interest (EOIs) for participation in the project are selected, an agreed number of Committee members receive foundational training on the project and, the VNRMCs sign the Village Grant Agreement³ with the DPMU to carry out plan preparation according to the guidance in the COM.

Subcomponent 2B: Implementation of community landscape plans and implementation support

10. Communities will implement CNRM plans in a phased manner, agreed through an addendum to the Village Grant Agreement between the VNRMC and respective DPMUs after a plan is approved. The addendum will specify the approved funding, milestones, and tranche releases for the plan. Communities will implement agreed first-phase activities in their plan and graduate to the next phase of financing if implementation meets agreed criteria. This approach is meant to incentivize performance-based access to funds by the communities. Interventions needed will be decided by the community in their respective CNRM plans but will be designed to enhance soil and water conservation; soil health improvement and productivity enhancement; spring-shed development and water management; nursery, agroforestry, and community forestry including interventions to introduce climate resilient native species; optimization of shifting cultivation; rehabilitation of areas affected by mining, and other NRM interventions. Criteria for assessing successful implementation will be agreed between the VNRMC and DPMU in the addendum to the Village Grant Agreement.

Subcomponent 2C: Implementation Support to Community Landscape Planning and Implementation

11. The State Project Management Unit (SPMU), with help from the Block Project Management Unit (BPMU) and village facilitators, will provide the geo-spatial data and analysis to inform the planning process in each village and later help monitor progress during implementation. Community members, in addition to village facilitators, will be trained to use some of the tools for data collection and mapping. Activities under this subcomponent will involve acquisition of satellite data; production of maps and reports; and training of technical personnel in the SPMU, selected facilitators, and community members. These tasks will be carried out under the direction of the SPMU.

Component 3: Project Management and Governance

This component will support the strengthening of the institutional capacity and knowledge management of the project implementing entity, MBMA, for the implementation and management of the project including, among others, (a) establishment of the SPMU within the MBMA and support to seven DPMUs, including technical staff and consultants; (b) the incremental costs associated with implementation; (c) administrative support to 20 BPMUs; and (d) technical fiduciary and safeguards oversight and supervision of project activities in the field.

³ Government of Meghalaya generally refers to the Village Grant Agreement as Memorandum of Understanding

12. The GoM has also prepared a comprehensive Project Implementation Plan which will guide implementation, and which will be updated from time to time by the GoM with the prior concurrence of the World Bank.