Sustainable Mekong Research Network

Regional Policy Brief

Integrating Community-Based Participatory Carbon Measurement and Monitoring with Satellite Remote Sensing and GIS in a Measurement, Reporting and Verification (MRV) System for REDD+

Key Findings:

- **An early assessment of community organization strengths and experience will be useful in determining if community organizing and strengthening should be included in the REDD+ set of activities.**
- **Training modules for community leaders and community participants in local languages facilitate knowledge transfer and help to ensure success in community involvement as it provides a rationale for why REDD+ projects would seek community support in measuring and monitoring forest carbon.**
- **In projects where linkages are weak, or do not exist, between communities and local agencies, the success of community inclusion is less likely to occur. In identifying sub-national REDD+ project activities, an assessment of community linkages to local agencies should be made.**
- **Training and capacity building, knowledge transfer for local agency personnel should be a part of the overall REDD+ readiness prior to project implementation. University researchers and NGO staff who may be part of a REDD+ activity should also be carefully vetted to ensure they have appropriate background, knowledge and skills.**
- **Identifying land tenure and resource use rights for a project area will help determine the likelihood of successfully integrating community participation in forest carbon measurement and monitoring activities.**
- **Project areas where forest laws are well defined and clearly understood by local communities will have more chance of success in REDD+ activities.**
- **The integration of local knowledge, tools and methods with modern scientific knowledge, tools and methods should be promoted in REDD+ activities working to build stakeholder participation from communities.**

Introduction

Lao PDR, Thailand and Vietnam are all Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and all three have ratified to the Kyoto Protocol. All three countries also are engaged in REDD+ activities: Laos with the World Bank Forest Carbon Partnership Facility (FCPF) and the Climate Investment Fund's Forest Investment Programme (CIF-FIP), Thailand with the World Bank FCPF, and Vietnam with the World Bank FCPF and the UN-REDD Programme.

Furthermore, all three countries belong to the REDD+ Partnership adopted May 27, 2010, which "expresses the intent of the governments … present at the Oslo Climate and Forest Conference on 27 May 2010 to provide a voluntary, non-legally binding

framework for the interim REDD+ Partnership, within which the Partners may develop and implement collaborative REDD+ efforts". Each country recognizes the necessity for a robust measurement reporting and verification (MRV) or evaluation (MRE) system that also includes monitoring as an important component. REDD+ safeguards and capacity-building are also important considerations for each country as they move forward with REDD+ activities.

Local communities as stakeholders in the measurement and monitoring of forest carbon

The Sumernet study on implementing an integrated community-based participatory and remote sensing measurement and monitoring system for REDD+ included three project areas, one each in Laos, Thailand, and Vietnam. The project team developed an approach that supports the participation of local communities as stakeholders in the measurement and monitoring of forest carbon. The approach includes capacity building and the use of an MRV/MRE on-line tool to quantify carbon stocks and to report emissions as ex ante scenarios or ex post calculations under a monitoring mechanism.

The outcomes of the 12-month project tasks and activities have provided important insights to REDD+ activities that support community participation, and important REDD+ safeguards, and also support capacity building and knowledge transfer. The three project areas are the National University of Laos Model Training Forest and three surrounding communities in Sangthong District, Vientiane, Laos; 31 villages and 21

different forest parcels (a mix of sacred or traditional conservation forests and public, community forests) in three districts in Mahasarakham, Thailand; and two community forest areas in Na Ri District, Bac Kan Province, Vietnam.

The project tasks and activities included community meetings and workshops to introduce the project and conduct two-way knowledge transfer. Project team leaders learned of community use of forest resources and community management strategies while community people learned more about climate change, climate mitigation and adaptation, and REDD+ concepts.

From the results of the project, we identified important community and policy-related elements that affect and impact (1) community involvement and capacity in REDD+ project activities and (2) help in integrating community-based field measurements with GIS and remote sensing for a REDD+ MRV.

Building community involvement and capacity

- Community leadership and organization: Project areas that have an organized community group with strong leadership are able to mobilize community efforts; project areas with less formal and perhaps less experienced community groups appear less able to participate in REDD+ activities.

- Knowledge of climate change: Local people in even the most remote areas seem to have some knowledge of climate change. The depth of their knowledge and accuracy of their knowledge, however, is not uniform. Basic understanding of the greenhouse effect, carbon cycle, drivers of climate change, etc. is useful to provide context for why measuring and monitoring is important for REDD+ projects.

- Linkages to local government agencies and others: the strength of a community's relationship with local government agencies in managing natural resources and others including academics, NGOs, etc. is dependent on many factors – personnel leadership and commitment, cultural and social norms, common goals in managing and using natural resource, even access and infrastructure play a role determining the strength of these linkages.

- Commitment and capacity of local agencies to support and integrate community participation and facilitate capacity building: In addition to simply having linkages between communities and local agencies that are part of implementing a REDD+ project, there needs to be knowledgeable and committed agency personnel in place. The local and provincial agency staff, University researchers, or NGO agency personnel must have expert knowledge on REDD+ and climate change science, as well as knowledge in natural resource management and be able to work effectively with community people.

Policy recommendations

- Tenure and use rights well defined: REDD+ interventions that target deforestation and forest degradation which may result from land and resource pressures from local people, must address rural livelihoods. In project sites where there are well-defined land tenure and access rights that include communities in forest land and resource management, or co-management with local agencies, show greater success in also establishing community willingness to participate in REDD+ measurement and monitoring. In such project areas, carbon can be viewed very clearly as a co-benefit, a public environmental service, which a forest provides in addition to the many important local benefits that communities benefit from (e.g. non-timber forest products, soil nutrients, regulated water flow, micro-climate conditions, etc.).

- Clear, transparent and effective forest laws: This element is related to tenure and use rights. Forest Laws need to be clear and enforceable. They should be well defined and transparent to local communities, in particular regarding use and occupation rights. In forest lands where use and occupation rights are restricted there is less chance that communities will participate in measurement and monitoring.

- Support local knowledge integrated with new technologies: Local knowledge of sustainable resource use and managements is often remarkably "scientific". Trial and error and observations are certainly part of local knowledge tradition. The technological or modern scientific approach should not always supersede the methods, knowledge and practice of local people in managing natural resources. Local people have effective tools for measuring and monitoring forest that can be utilized. Simple means of calculating tree heights, ground slope, etc. do always require hi-tech tools. The effective computation of carbon from these measurements requires some advanced scientific knowledge.

- National committees with clear implementation plans – data custodian, stewardship and standards: National REDD committees as part of the REDD readiness are developing implementation plans under such programs as UN-REDD, FIP, and FCPF, that define data stewardship, custodian and access rights, and standards. Such plans may differ from country to country based on national needs and requirements. The use of on-line MRV systems will need to consider the National REDD+ implementation strategy and plans, in particular, for data standards, management and access. MRV systems must be flexible enough to support different needs as they are defined by each REDD+ implementing country.

- Data management tools: Forest biometric data collection can be done using simple or hi-tech tools. The diameter at breast height of a tree can be measured with a DBH tape or a simple tailor's tape and the measurement converted to diameter. GPS devises are now common in University labs and with local agencies in the field. The management of data measurements, however, must be systematic and uniform across biomass plots within a project location. Common print outs of spreadsheets, or data fields in data loggers are important. Tools to manage all project data are also very important. Ideally, with web-based service more and more common, data management can be developed as a set of tools for REDD+ projects that include basic description and management, document and file management, plot level data management and carbon stock calculations, geo-spatial data management and even emissions reporting.

- Measurement and monitoring for REDD+ can effectively combine local, community data collection with expert analysis using remote sensing and GIS: National-level forest measurements often are conducted under National Forest Inventory (NFI) programs in which permanent samples are established and repeat measurement are taken every few years. Forest monitoring, to assess areas and rates of change, is most often conducted using satellite remote sensing. The combination of ground based plot biomass measurements with satellite remote sensing analyses is a powerful combination for measuring and monitoring REDD+ carbon stock and carbon stock changes. Integrating community level plot measurement data with geo-spatial analysis (GIS and remote sensing) supports REDD+ measurement and monitoring requirements for an MRV system. The combination recognizes the need to integrate community level abilities with professional, expert analysis. Measurement and monitoring of REDD+ carbon, therefore, is not dependent on ground only or remote sensing only techniques, but a combination of the two.

- Develop advanced MRV systems that include other ecological and social data (beyond carbon) that scale: REDD+ projects may focus primarily on greenhouse gas emission fluxes, but also must be cognizant of additional ecological and social co-benefits. Forest Carbon MRV systems supported by governments should include additional data management and reporting functions to include ecological and social data. Such system should not be scale dependent and provide support from local level to national and regional level REDD+ activities. National REDD+ MRV systems can be supported through on-line technologies and include more than just carbon accounting. Such systems can be scalable and flexible to support a variety of national-needs objectives and implementation plans.

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