

action research in Sangthong District, located on the Mekong plains 80 km north-west of Vientiane. In July 2011, the team made a preliminary field visit to Sangthong to meet with the District Agriculture and Forestry Office (DAFO). We initially selected 8 villages as candidates for the action research, and after considering location, forest types, and forest resources tenure, as well as our resource and time limitations, we reduced the list to 3 villages. From July to September, the research team reviewed documents related to REDD+ and carbon assessment and from these developed a set of training materials for researchers, including presentations, hand outs, and data collection sheets. From August to September, the team developed survey instruments for a planned baseline survey, targeting village committees (for focus group discussions) and the household heads (to act as key informants). The survey was conducted in December.

In November, we carried out a 2-day training workshop on REDD+ awareness, the ideas and concepts of community carbon measurement and monitoring, methodologies for carbon accounting, developing baseline survey instruments, and alternative sample plot designs for carbon accounting. The workshop was run as a short-term training course of the Faculty of Forestry. For further details of the training, see:

<https://sites.google.com/a/nuol.edu.la/bo-utthavong/cca-in-laos/nuol-researcher-training-ws>



Figure 10: CCA training at NUOL

The 13 trainees were divided into 2 teams and each set up sample plots for tree measurement. The tree data were entered into an Excel spreadsheet and then trainees presented their results as part of the training program. Different allometric equations were tested during the training workshop.

For further information contact

Henry Scheyvens
Director, NRM Group,
Institute for Global
Environmental Strategies

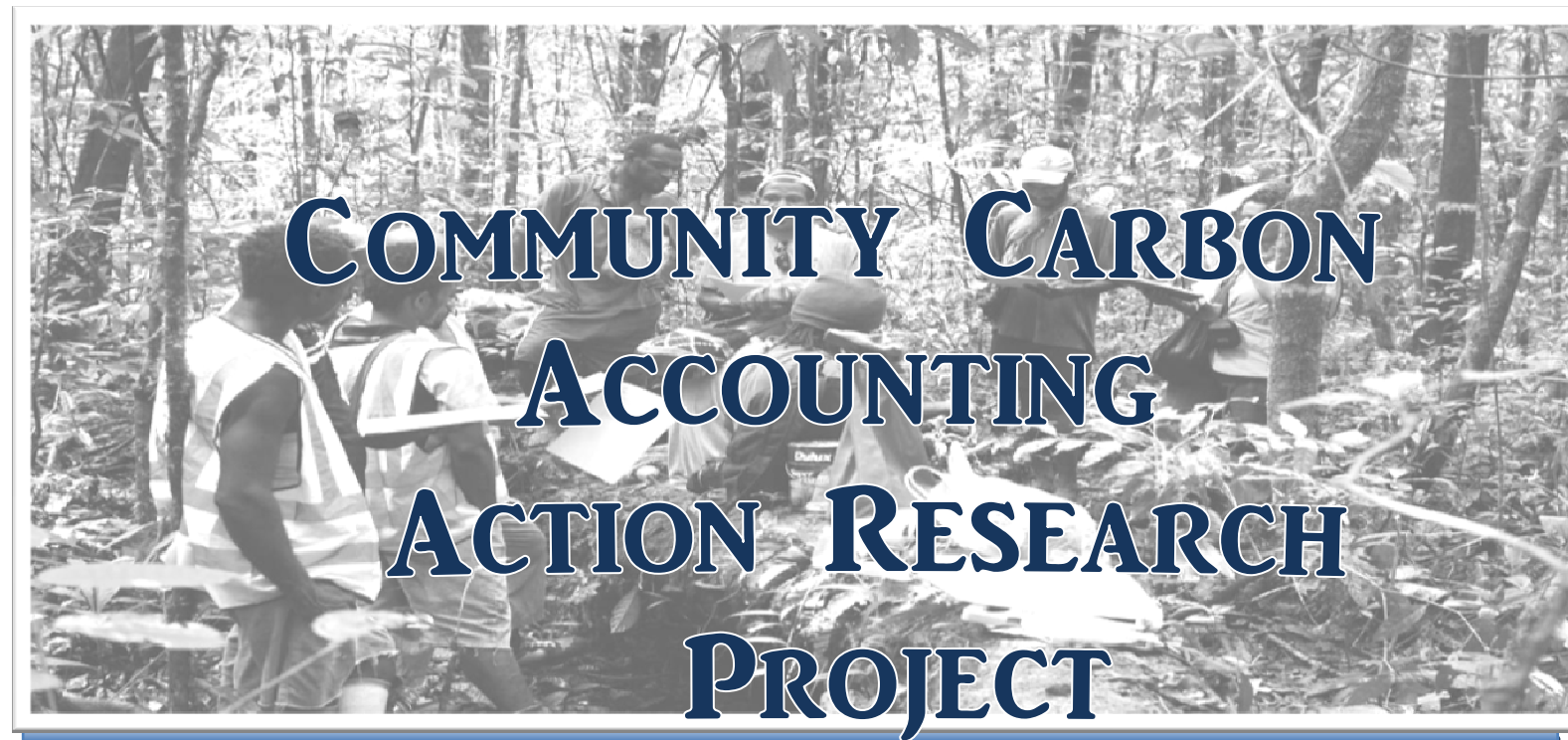
2108-11 Kamiyamaguchi
Hayama
Kanagawa
Japan 240-0115

PHONE:
+81 46 855 3837
FAX:

+81 46 855 3809
E-MAIL:

scheyvens@iges.or.jp
WEB:

<http://www.iges.or.jp>



Project outline

The destruction of forests contributes to global climate change by releasing carbon dioxide (CO₂) into the atmosphere and by reducing the potential of forests to absorb CO₂. Good forest management is an important part of the solution to global climate change.

The Community Carbon Accounting (CCA) Action Research Project was launched with the intention of elaborating approaches for engaging communities in forest carbon stock monitoring. Although carbon stock monitoring requires high technical expertise, the project partners believe that local communities can make an important contribution to carbon monitoring by participating in mapping and sample plot establishment and measurement. Community engagement in forest carbon monitoring will increase local understanding of, and commitment, to REDD+ activities, which will increase the likelihood of long-term emissions reductions and reduce social and environmental risks.

In particular, when communities themselves are forest owners and managers, it makes good sense for them to be involved in any efforts to generate scientifically verifiable data to monitor



Figure 1: Communities testing alternative methods for estimating tree diameter at upper stem sections, Seima Community-Based Production Forest, Cambodia

carbon stocks in their forests. With this capacity and knowledge, communities will be in a much stronger position to understand the trade-offs of alternative forest uses and to negotiate with outsiders (carbon professionals, etc.).

The Community Carbon Account Action Research project is being implemented at sites in Cambodia, Papua New Guinea, Indonesia and Laos according to local contexts, opportunities and needs, guided by the generic approach outlined in Fig. 2.

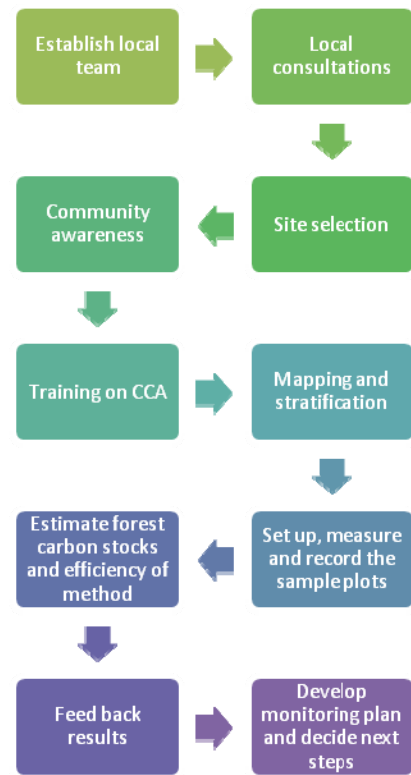


Figure 2: Action research flow

The methodology for the Project is *action research* (or *action learning*), which is an interactive inquiry process that balances problem solving actions with data-driven collaborative analysis or research. For CCA, action research involves communities as co-researchers through a cyclical process of planning, action, observation and reflection.

REDD+

A global mechanism known as REDD+ is being developed that will provide incentives to developing countries to

implement activities that protect and enhance their forest carbon stocks.

Accurate monitoring of forest carbon is required to assess the contribution of REDD+ activities to global climate change mitigation. While the monitoring of forest carbon is a highly technical issue, with adequate support, communities who live close to the forests can make an important contribution, if provided the necessary training and support. They can make an important contribution not only through forest measurement, but also through their knowledge of ecosystems and removals of biomass.

Action research on community carbon accounting also makes sense in terms of the decisions taken by the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). The COP has set the participation of stakeholders, especially local communities and indigenous peoples, as a one of the safeguards for REDD+, and in Decision 4/CP.15 encourages the development of guidance for effective engagement of indigenous peoples and local communities in monitoring and reporting.

Aim and objectives

Aim

- Through practical involvement in data generation, build community capacity to participate in, and benefit from, the negotiation, design and implementation of REDD+ activities.

plots. A sampling manual was drafted in Indonesian to guide future work.

The activities in Semoyo in 2011 have included: further development of training materials; a refresher training for 25 villagers and training on MS Excel for 21 villagers; improvement of the filing system; plot maintenance; measurement of litter and non-wood carbon stocks; and remeasurement of wood carbon stocks. The Semoyo leaders are currently preparing a learning module on environmental issues, with climate change as one of the main subjects. They intend to use radio to make this module available.



Figure 8: Semoyo villagers acting as trainers at Terong Village

In Burat Village, a refresher training for 10 people and a shared learning forum in which residents from Semoyo and Burat participated were organised, and plots were measured by 5 people from each of the 5 sub-villages.

During September 2011, the CCA action research was extended to the neighbouring village of Terong. The CCA process has included: a field level dialogue at Semoyo for 16 Terong

villagers on CCA basics; a dialogue on carbon assessment for 15 villages; a 4-day training of trainers for 10 villagers; and a training of 45 villagers from all 9 sub-villages. The villagers from Semoyo acted as trainers, explaining to their neighbours the concepts of climate change, carbon sequestration and the establishment of permanent sample plots.

A 1-day district level workshop on CCA was organised in Gunung Kidul and was attended by the participating villages, the district government (heads of forestry and environment), IGES, DKN and ARuPA. Semoyo explained their CCA work and showed a video that described CCA and the importance of environmental services to the community. Terong explained that they had established a total of 180 plots under the CCA project.



Figure 9: Terong villagers participating in field training

Laos

The Faculty of Forestry, National University of Laos, launched the CCA

in relation to precision and time. In 2011, the biomass measurement of a dominant timber species was conducted to develop an allometric equation. Developing local regression equations is important to improve the accuracy of measurements.

Lessons learned

From an action learning perspective, the activities demonstrated an approach to engage communities in forest carbon stock monitoring. Capacity building in this context is a process, and the communities' understanding will increase as they gain more experiences in participating in different activities under the CBPF. It is important that community members have a greater role than simply participating in the data collection. Once data analysis is completed, review sessions with the communities are essential to continue the gradual process of building technical understanding of the carbon and timber stock data. Regarding technical issues, the level of effort necessary to reach the sample fraction level required in the guideline was much lower for the k-tree method (the total working time was 24-43% lower). However, the precision level of the result from both methods was too low for timber harvest planning for sustainable forest management and estimating carbon stocks in a REDD project. Compared to the existing methodologies for forestry carbon projects, a larger sample size will probably be necessary to meet precision targets, although the approach in the

current guideline allows estimating most key carbon pools.



Figure 7: Weighing leaves to develop a biomass allometric equation

Indonesia

In 2010, DKN and ARuPA (*Volunteers Alliance for Saving Nature*) launched the CCA action research in Wonosobo and Gunung Kidul districts in the provinces of Central Java and Jogjakarta. A number of consultations were initially held with local governments and villages to select the research sites.

Consultations in Gunung Kidul led the team to select Semoyo Village, where they introduced the concept of CCA to the village leaders in a series of meetings. After consultations, trainings of trainers and community members were undertaken; the sampling design was created; the sample plots were established and carbon stocks measured; and the data were analyzed. Measurements were taken in both dry land farms and home gardens in all 5 sub-villages, using linear and rectangular

Objectives

- Identify roles of local communities in monitoring, reporting and verification (MRV) methodologies of REDD+ and consider options for equitable payment distribution systems to reward their inputs;
- Elaborate and demonstrate community carbon accounting to engage communities in the generation of information as part of monitoring strategies for REDD+;
- Enable communities to understand the potential trade-offs of alternative forms of forest management and use, including management for climate change mitigation;
- Share the lessons learned on community carbon accounting to encourage their uptake at national and sub-national levels.

Implementing organizations

- Institute for Global Environmental Strategies (IGES)
- RECOFTC - The Center for People and Forests
- Wildlife Conservation Society (WCS)
- Foundation for People and Community Development (FPCD)
- Indonesia National Forestry Council (Dewan Kehutanan Nasional - DKN)
- ARuPA
- Faculty of Forestry, National University of Laos



Figure 3: Preparing to establish and measure sample plots, Brahman, Madang, Papua New Guinea

Financial support

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Partner Updates

Papua New Guinea

The action research in PNG is being conducted with 5 communities in Madang Province who are receiving support from the Foundation for People and Community Development (FPCD) for certified sustainable community forestry. FPCD is a national NGO that supports the communities to manage their forests according to Forest Stewardship Council

principles through its Certified Community Forestry Program. The Program includes forest boundary demarcation; forest inventory and socio-economic baseline surveys; forest management, timber milling and small business training; and forest certification. FPCD foresters have been working intensely with the communities since 1997, and the CCA action research is thus able to take advantage of the trust relationships that exist between the foresters and the communities, strong community institutions, as well as the information that has already been generated.

Workshops

To build the capacity of the facilitation team to work with the communities on carbon monitoring, two workshops were conducted at the FPCD office in Madang township. On 29 July 2010, a workshop was conducted on methodologies for biomass estimation and forest carbon accounting. The workshop was facilitated by Dr. Simon Eggleston, Head of the Task Force on National Greenhouse Gas Inventories (NGGI) under the UN Intergovernmental Panel on Climate Change, and was attended by FPCD forestry staff, the PNG Forestry Authority REDD / Climate Change Team, headed by Mr. Goodwill Amos, and a representative of The Nature Conservancy.

A second training workshop took place from 04 – 08 July 2011 to build capacity for FPCD to use Geographic Information Systems for the mapping of the 5 community forests under the CCA action research. Perry Malan, Senior Cartographer, PNG Forestry Authority (PNGFA), acted as the trainer. All the

training was conducted using MapInfo Professional.



Figure 4: GIS training, FPCD Office, Madang

Mapping and stratification

Prior to the introduction of the CCA, FPCD conducted mapping of forest boundaries with the clan members, and facilitated participatory land use planning for the clans to place controls on their land use. The forests are now being stratified according to carbon stock densities and all of this information is mapped using GIS.

Training and measurement

Awareness on climate change has been conducted with each of the 5 clans. The approach taken for the training and measurement has been to establish teams of foresters and clan members at each of the forests, and for training to be provided to the clan members during the course of plot establishment and measurement. Training has been provided on tree diameter and height, and on deadwood measurements.

A pilot survey is being conducted to calculate the total number of sample plots required for accurate carbon stock

monitoring. Nested sample plots have been established across the 5 forests to generate the necessary data. The plots are set out using metal stakes, the trees within the plot are numbered and tagged and the measurements are recorded. For data processing, an Excel spreadsheet with inbuilt functionality is used. Preliminary analysis indicates high variation in carbon stocks within the same vegetation class, reflecting high variation in disturbance and topography.



Figure 5: Training on height measurement

Cambodia

The CCA action research in Cambodia is being conducted by RECOFTC and WCS with the Forestry Administration (FA) and communities in the Community-Based Production Forestry (CBPF) project in the buffer area of the Seima Protection Forest. The CBPF forest covers 12,750 ha of logged evergreen, semi-evergreen and mixed deciduous forest and is a permanent forest estate under the jurisdiction of the FA. Three traditional ethnic Bunong communities were involved in the activities.

Activities

Carbon assessment cannot be a stand-alone activity and should be integrated into the broader forest management strategy. The CCA action research in Cambodia aims at enabling local communities to measure and estimate carbon stocks as well as testing the timber inventory methodology set out in the Community Forestry Guidelines. In 2010, the action research activities included REDD+ awareness raising; consultations and community launch meetings; training of trainers on inventory techniques; the testing of alternative plot designs and measurement methods; training of 30 community members; inventory; data collection for diameter-height relationships; and data analysis.



Figure 6: Trainer explains how to read clinometers to community members

Inventory was conducted in both deciduous and evergreen forests using the fixed rectangular sampling method specified in the Community Forestry Guidelines and the k-tree sampling method, which was proposed as a cost effective sampling alternative. The results of the two methods were compared in terms of sampling efficiency