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Assessing Potential Co-Benefits of REDD+ in Shifting Cultivation Landscape

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ABSTRACT: This study aimed to assess the potential and options to achieve co-benefits of REDD+ for carbon sequestration, biodiversity conservation and livelihood improvement in shifting cultivation landscape. Carbon stocks and biodiversity in different land-use/land-cover types were inventorised from selected cultural landscapes. A socioeconomic survey was employed to assess the economic benefits of different land uses and the opportunity costs for alternative land uses. The integration of biophysical and socioeconomic data led to the identification of potential land-use practices to enhance carbon stocks and economic benefits, as well as biodiversity. Good land-use practices were demonstrated to local farmers and officials. The results of this assessment were used to train local stakeholders to manage, measure and monitor forest carbon pools.

KEYWORDS: *REDD+, co-benefits, shifting cultivation, landscape, Laos, Thailand*

Project Objective and Relevance to the APN's Science and Policy Agendas

Traditional shifting cultivation, widely practiced in the tropical forests, integrates a short cropping phase and a long forest fallow phase in rotation. In the cropping phase, many cereals, root crops and vegetables are cultivated to ensure a balanced diet for shifting cultivators; soil seed bank and tree stumps conserved through zero tillage to facilitate subsequent forest regeneration. In the fallow phase, forests not only provide a range of products but also contribute nutrient inputs to surface soil through uptake from deep soil horizons and nitrogen fixation, but also sequester carbon, control weeds, and check soil erosion for the succeeding cropping phase. Apart

from forest fallows, natural forests are maintained by shifting cultivators to timber production, recharging water sources and spiritual values. Nevertheless, shifting cultivation is under increasing pressure to shorten its forest fallow phase and change to other land uses with implication on local livelihoods, carbon sequestration and biodiversity.

With the support of the Asia-Pacific Network for Global Change Research (APN) and the United Nations University (UNU), in partnership with National Agriculture and Forest Research Institute (NAFRI) in Laos and Chiang Mai University (CMU) in Thailand, we are undertaking a three-year project to assess the potential and options for shifting cultivators to build on traditional knowledge and achieve co-benefits of carbon

sequestration, biodiversity conservation and livelihood improvement through the new global initiative for reducing deforestation and forest degradation, including the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+). The project promotes regional cooperation on sustainable land management between Laos, Thailand, India, China and Japan, and is improving the scientific and technical capabilities of participating countries through research collaboration and exchange. The project is also providing scientific input to policy-making in REDD+ implementation, especially at national and local levels; contributing to relevant policy debates; and assisting in developing policy guidelines at national and international levels through the Asia-Pacific Forest Partnership and the Mountain Partnership, where UNU is formally represented, and other platforms as opportunities arise.

Progress to Date

The project selected two study villages, one each in Northern Thailand (Tee Cha, a Pwo Karen village in Mae Hong Son Province) and Northern Laos (Laksip, a Khmu village in Luang Prabang Province). Rotational shifting cultivation remains the major livelihood in the study village in Northern Thailand, while in Northern Laos, this land use is being replaced with timber plantations. The two villages offer a good comparison of traditional land-use systems in transition, with consequences on carbon stock, biodiversity and livelihoods. Significant progress has been made since project inception in 2011. Land-use survey



and mapping has provided a basis for stratification of the village landscape into relatively homogenous land-cover/land-use units for assessment of carbon storage, biodiversity and identification of land-use practices rich in these resources. The inventory brought out the spatial distribution of carbon stocks on the village landscape, with the highest carbon intensity in the natural forests, followed by forest fallows and permanent crop fields. The carbon stock increased with the age of fallows. Fallows held carbon stocks comparable to teak plantations but larger than the permanent fields. The opportunity cost of forest conservation to a coffee plantation at the project site in Thailand was US\$0.47/ton CO₂ and to teak plantations at the project site in Laos was US\$0.952/ton CO₂. The research also analysed historical land-use and carbon stock changes and projected future land-use scenarios including possible baseline/reference levels. The knowledge on carbon stocks, biodiversity and economic benefits of different land use practices obtained through field surveys and laboratory analyses, was shared with local communities and governments for community-based management of terrestrial carbon pools and appreciation of the potentials for co-benefits of carbon, biodiversity and local livelihoods. Good

land management practices were identified and demonstrated. One example to establish good practices to enhance soil carbon stock and plant diversity in teak plantation, such as the abandonment of farmers' practice to ground fire every year, was demonstrated by making a comparison of two demonstration plots in Laksip village, Laos.

A training course was organised to train farmers and local forest officers at Tee Cha village, Thailand for building local capacity for meeting the monitoring, reporting and valuation requirements of the REDD+ programme. Organisation of several project workshops has facilitated the exchange of knowledge and experiences among project team members and development of working guidelines on carbon stock measurement as well as community-based monitoring, reporting and verification (MRV). The results and findings will be synthesised and disseminated at national and international levels in the final year of the project.

Project Publications

- Takeuchi, K. (2012). Forest carbon stocks in shifting cultivation of Thailand and Laos. *APN Science Bulletin*, (2), 142–144.
- Takeuchi, K., Takahashi, S., Lim, A., Kawasaki, J., & Liang, L. (2011, September). REDD+ for forest communities based on lessons learnt from forest conservation efforts in Laos and Thailand. *APN Newsletter*, 17(3), 3–4.

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PROJECT TITLE

Critical Analysis of Effectiveness of REDD+ for Forest Communities and Shifting Cultivation, Based on Lessons Learnt from Conservation Efforts in Laos and Thailand

COUNTRIES INVOLVED

Japan, Lao PDR, Thailand

PROJECT DURATION

2 years

APN FUNDING

US\$ 120,000

PROJECT LEADER

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