4.6 Smallholders in Thailand and REDD+ and FLEGT linkages

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Introduction

FLEGT and REDD+ have common interests and goals. Both work towards reducing pressures on natural forest by addressing underlying causes of deforestation and degradation. Both can have important impacts on climate mitigation by effecting important land-use changes.

This article highlights a potential opportunity for FLEGT and REDD+ initiatives that focus on smallholders in Thailand. Smallholders are individual farmers or farmer families whose primary livelihood activity is farming. Their farm areas may include trees that support household needs, either through cash transactions or direct use.

Smallholders in Thailand are contributing to reducing deforestation and forest degradation and mitigating climate change.

Smallholders throughout the tropics grow and manage trees on farms (Zomer et al. 2009), which may include small plantations. In some regions, including Southeast Asia, the number of industrial forest plantations has grown (STCP 2009); these include smallholder plantations and large plantations. Some countries also have successful community-managed forests (Porter-Bolland et al. 2012).

This article discusses two examples of smallholder plantations and one community-managed forest in Thailand[1] (Figure 1):

- the Inpang Network, an farmer cooperative in Northeast Thailand that is growing and managing trees, including small woodlot plantations, as part of their farmland mosaic;
- rubber plantations in Nakhon Phanom Province along the border with Lao PDR; and
- a group of 31 villages in Mahasarakham Province who manage or co-manage community forests with government agencies.

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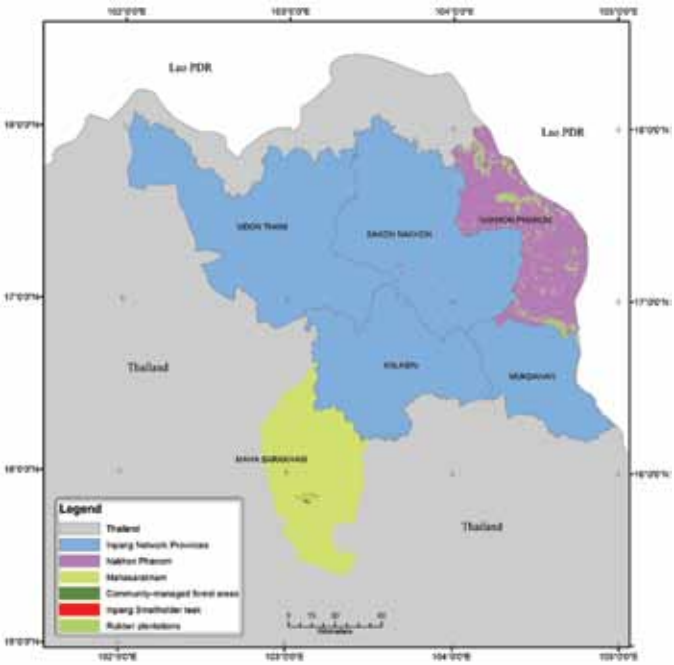
Figure 1. Map of small-holder plantations and community-managed forests, Thailand



Communities and small-holders who are actively managing trees that produce resources to support livelihoods can contribute to both FLEGT and REDD+ goals. The long-term storage of carbon in woody biomass on farms and the renewable nature of smallholder plantations both help mitigate climate change.

They are net positive,
however, only when they do not replace natural forests. There is a great opportunity for a linkage between smallholder land-use activities and the FLEGT and REDD+ initiatives. Smallholders can be potential and important participants in both REDD+ and FLEGT activities.

FLEGT, REDD+ and forest carbon policy in Thailand

Thailand is one of nine countries currently in negotiations with the EU to establish a FLEGT Voluntary Partnership Agreement (VPA).[2] The Thai Royal Forest Department began discussions on FLEGT in 2009 and started negotiating the VPA in 2013. This came after the Government of Thailand (GoT) formalized an agency management structure within the Ministry of Natural Resources and Environment (MONRE) to support FLEGT initiatives in Thailand and after the Thai National Assembly endorsed the VPA negotiations (RFD 2013). The VPA is expected to be finalized in early 2014 (RFD 2013). Thailand is also developing a National Single Window (NSW) tracking system to support a Timber Legality Assurance System, or TLAS (Suwannawimon 2013).

Unlike Brazil, the DRC or Indonesia, where vast tropical forests still exist and where REDD-related investments are substantial, Thailand's forest resources are more modest. Thailand is one of eight Asia-Pacific countries participating in the World Bank Forest Carbon Partnership Facility (FCPF).[3] Thailand received a US$ 200,000 grant to develop a REDD Readiness Preparation Proposal (R-PP; FCPF 2013) and submitted a revised R-PP in December 2013, which is under review by the FCPF (FCPF 2013). As with FLEGT, MONRE plays a central role in REDD+ policy and implementation in Thailand.

Thailand's land-use and forestry sector was a net sink of GHG gases (minus 3.44% of emissions) in 2000 (ONEP 2011); the energy sector accounted for 70% of national GHG emissions. It is therefore not surprising that the GoT's focus on mitigation strategies and low-carbon development is heavily weighted towards the energy sector. In spite of this fact, Thailand has developed policy and institutional capacity for including land-use change and forestry activities in its mitigation efforts.

National assessments of Thailand's forest cover show that it has stabilized at around 30–35% of the country area for the past five years. However, there is still ongoing deforestation and forest degradation in certain areas of the country due to encroachment for development, conversion for agricultural crops, mining, illegal logging and fire. Thailand's efforts to reduce deforestation and forest degradation as outlined in its R-PP, and its efforts at improved governance and timber trade as shown in its involvement with the EU FLEGT initiative, indicate the value the government places on its forest resources.

Smallholder plantations and community forest management

An increasing area in Thailand is used for industrial forest plantations. This includes both smallholder and large-scale plantations. Plantations are dominated by eucalyptus, teak, rubber (for wood and latex) and acacia, and to a lesser extent by exotic hardwoods other than teak.

The farms of the Inpang Network are a good example of smallholder plantations. Formed in the mid-1980s by a handful of people seeking to break the burdensome debt cycle they faced from farming cash crops, the Inpang Network[4] has grown to more than 4,000 members across five provinces in northeast Thailand. The network is a farmer cooperative that supports farmer-to-farmer training. Members also maintain a number of learning centres that support micro-enterprises (such as wine- and juice-making, herbal medicines and bio-diesel).

In 2008 the authors conducted surveys with 957 Inpang members, with a focus on their planting and management of trees, including smallholder plantations. Members listed 254 different woody perennial tree species. They plant trees for timber, fruit, latex and resins. Some species provide spices for cooking and some are grown for their medicinal properties. More than half of the species identified have multiple purposes (Samek et al. 2011). The ten species most frequently grown by the respondents are shown in Table 1.

Shorea obtusa, like teak, is a valuable hardwood. All of the species listed in the table, except mango but including rubber — which also produces valuable latex — are used for

construction and furniture. In addition to the importance of these species for timber, Inpang members also grow them in small, single-species or mixed-species plantations for environmental and livelihood benefits. These deciduous trees enhance soil nutrients, which is an important goal for a number of Inpang members who experienced severe soil degradation from planting annual cash crops such as cassava and sugar cane with high fertilizer inputs. Soil improvements are not the only benefit: the leaves of the *Xylia xylocarpa* are a favorite nesting habitat for Weaver ants, whose eggs are considered a delicacy. *Xylia xylocarpa* and other species (*Dipterocarpus alatus*, *Pterocarpus macrocarpus*, *Irvingia malayana*, *Adenanthera pavonina*, and *Hopea odorata*) also create favorable habitat for edible mushrooms.

Table 1. Tree species planted on farms by Inpang Network members, 2008

Species	Number of trees reported	Number of households reporting
Shorea obtusa	146,564	509
Dipterocarpus tuberculatus (garjan tree)	129,306	426
Hevea brasiliensis (rubber)	99,720	114
Xylia xylocarpa (iron wood)	93,210	510
Pterocarpus macrocarpus (Burma padouk)	78,456	491
Eucalyptus	59,268	72
Sindora siamensis var. *maritima*	50,741	246
Mangiferina indica (mango)	38,133	360
Tectona grandis (teak)	30,769	116
Cratoxylum formosum	20,034	135

Smallholder plantations

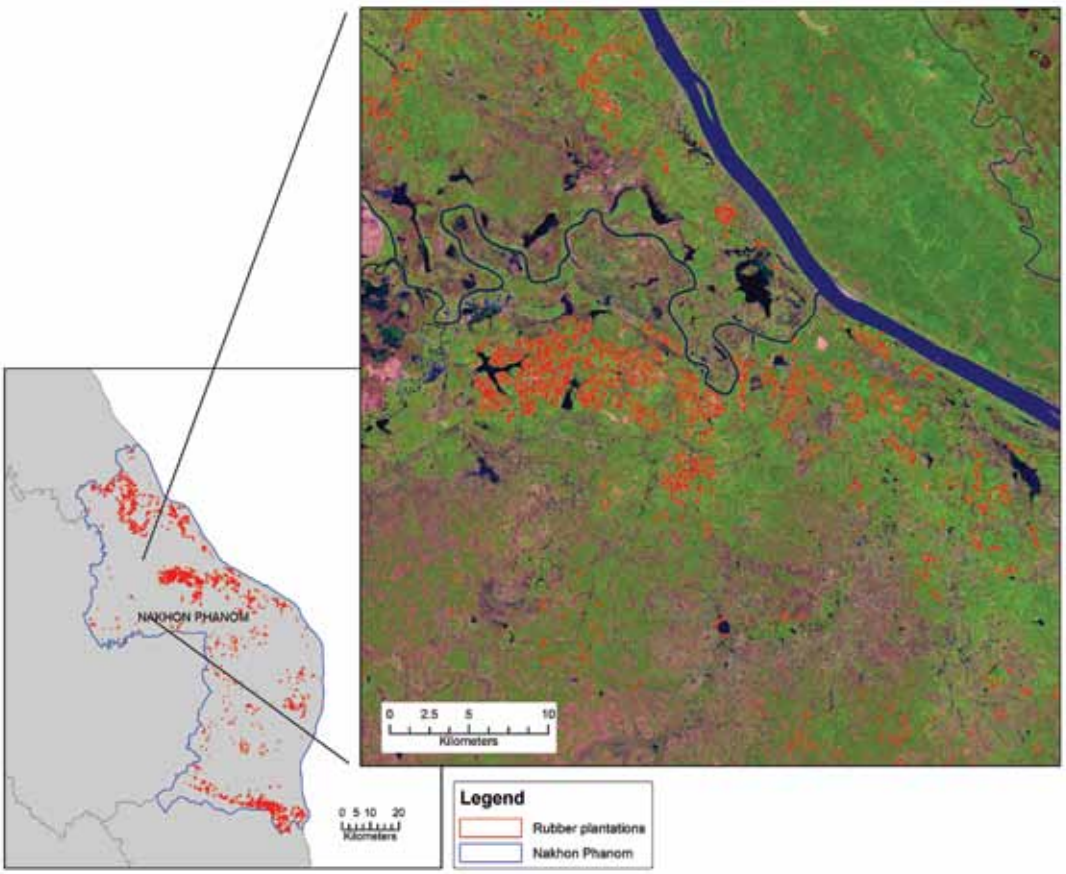
In addition to annual crops, Inpang farmers also plant two perennial species: teak and rubber. These are often intercropped with annuals and other perennials. The authors analyzed data for the age class, plantation size and carbon stock and sequestration rates of the Inpang smallholder teak and rubber plantations:[5]

- 49 teak plantations totaling 83 hectares (ha) were analyzed. The average plantation size was 1.68 ha; nearly half were less than 2 ha and only two plantations were greater than 5 ha. These are truly smallholder plantations and are recently established on lands previously planted in annual crops. In 2008 the average plantation age was 13 years (planted in 1994), with all plantations planted after 1990 and three areas established in 2000. At a sequestration rate of 10.65[6] tonnes of CO_2 per ha per year, and using a simple linear ex ante calculation appropriate for a short growth period with young trees, these teak plantations could sequester approximately 13,250 tonnes of CO_2 over a 15-year period.

- Analysis of the survey data for the rubber plantations shows that 104 respondents (11%) plant and manage rubber trees on 114 plantations (some respondents own more than one plantation). The total area planted is estimated to be approximately 150 ha, at 667 trees per ha and a reported 99,720 total trees. Using the same plant spacing estimator, 79% of the rubber plantations are less than 2 ha and the largest is only a little over 6 ha. These are also smallholder plantations similar to the teak areas established by Inpang farmers.

The authors also analyzed GIS data for rubber plantations in Nakhon Phanom Province for 2009–11 to determine the expanse of smallholder plantation versus large plantations and to understand patterns of plantation expansion (Figure 2).

Figure 2. Map of rubber plantations in Nakhon Phanom Province, Thailand



Source: derived from 2009–11 SPOT 5 satellite data

The data show polygons of rubber plantations between four and six years old and those greater than six years old. Polygons also delineate ownership. In total, 1,815 plantations are identified, covering an area of 13,425 ha. The number of polygons in each age class are similar (4–6 yrs = 980; > 6 yrs = 835), as are the total areas (4–6 yrs = 6,374 ha; > 6 yrs = 7,051 ha), indicating that plantation establishment is rapidly expanding in the province. The plantation sizes are indicative of smallholders. The average parcel is 7.40 ha, and nearly three quarters of the polygons (73%; n= 1335) are between 1 and 7 ha. Only 25 parcels (1% of the total number) are greater than 100 ha. Like the Inpang teak plantations, these rubber plantations actively sequester carbon from the atmosphere as they grow. Teak and rubber plantations that replace annual cropland and degraded land are net sinks of CO_2.

Community-managed forests

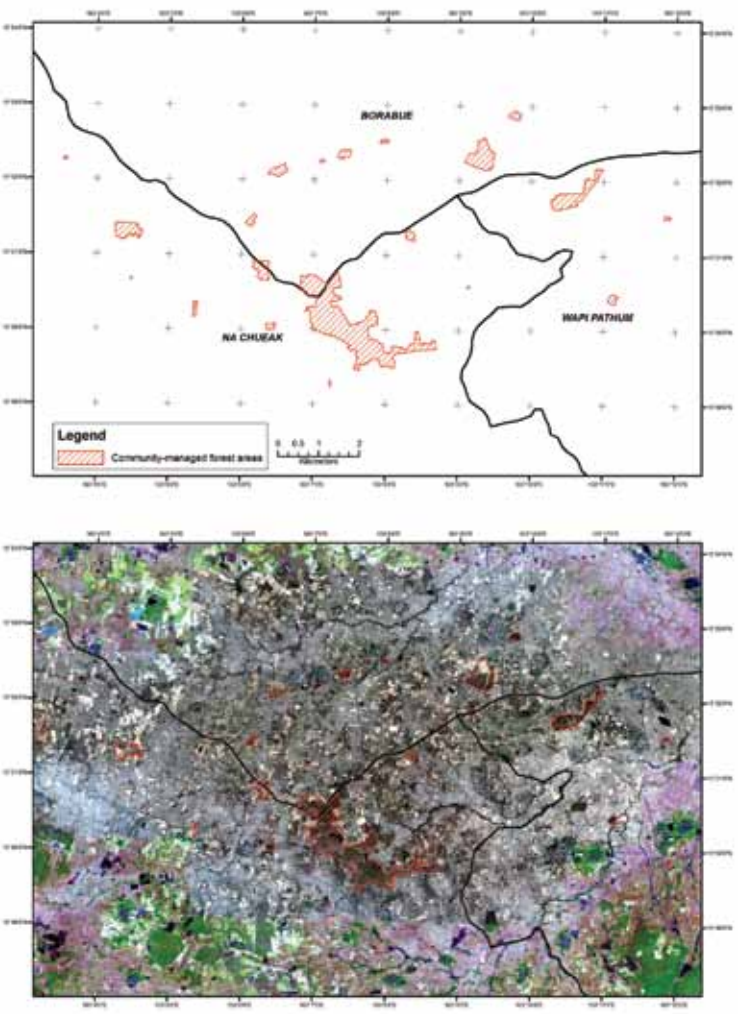
Many communities in Thailand also actively manage natural forest areas or co-manage them with Thai government agencies. Through regulatory mechanisms these communities help maintain biodiversity and standing stocks of natural forest areas. These communities are important to REDD+ because of their management responsibilities and activities. In the districts of Borabue, Na Chueak and Wapi Pathum in Mahasarakham Province 31 villages are responsible for managing a number of forest parcels. The largest, Kok Pak Kud-Pong Dang Forest, is a conservation forest area of 336 ha under the Royal Forest Department but co-managed by communities with limited use and access.

In addition, the communities are involved in managing 20 additional forest parcels; these include sacred or traditional conservation forests and public community forests (Figure 3). These additional forest areas range in size from less than 1 ha to more than 30 ha.

The carbon stock in the total area of community forests (474 ha) is estimated at 13,561 tonnes.[7] These communities work very closely with provincial authorities from the Thai Agriculture and Land Reform Office (ALRO). Together, they have developed rules for access to and extraction of resources (non-timber forest products, fuelwood, etc.) from these forest areas. A combination of common law (civic) and customary law (traditional) supports the sustainable management of these forest areas by communities.

Community involvement in the management of these remnant natural forest parcels does not guarantee the continued storage of carbon through reduced deforestation and degradation. However, given the Thai government's limited policing and enforcement resources to keep people out of these forest areas, community management may be the only solution to sustain these forest parcels and retain their carbon storage. Historical analyses of changes in forest cover using satellite data can be used to determine if these forest areas are shrinking; such analysis was beyond the scope of this research. It is possible that some community forest types are managed better than others and are not degraded. Many factors contribute to how sustainably these forest patches are managed and to the effectiveness of community use of forest resources and carbon loss or carbon storage.

Figure 3. Community forest areas in Mahasarakham Province, Thailand



Opportunities to link to REDD+ and FLEGT implementation

The area under smallholder plantations in Thailand is expanding. Smallholders are growing and managing trees for a variety of reasons that support their livelihoods. Smallholders in Thailand, as in other tropical developing countries, are likely supplying, at least in part, timber for the international trade. In the case of the Inpang members growing teak, some of their trees are being planted to supply the future construction need of their children, and some are sold.

These teak plantations are established on land that was previously devoted to cash crop agriculture. They are sequestering carbon; even when the trees are harvested, much of the sequestered carbon remains stored long term in wood products. The Inpang members who are growing species for timber and wood products are also reducing pressure on the local

protected forest area of the Phu Pan National Park in Sakon Nakhon Province by obtaining products from their own lands rather than extracting them from the natural forest. This is not to say that all pressures on the Phu Pan National Park have ceased, only those impacts now replaced through tree planting by Inpang members. Inpang members do use the nearby natural forest as a seed bank for the establishment of tree nurseries for a number of timber and non-timber species that sustain their households. One founding member, Serm Udomna, has planted more than 300 tree species on his small farm; some people say that he has transported the Phu Pan forest to his home.

Conclusions

Smallholders in Thailand can make important contributions to sustainable forest management and climate mitigation policy and projects, which can in turn support FLEGT and REDD+ objectives. Smallholders in Thailand are actively contributing to reducing deforestation and forest degradation and mitigating climate change by helping to conserve natural forest areas (as in Mahasarakham) while still using them and by sequestering carbon from planting and managing small-area plantations (e.g., Inpang teak and rubber plantations and small-area rubber plantations in Nakhon Phanom).

Furthermore, for REDD+ initiatives, local people and communities are required to be part of actions as set out in Free, Prior and Informed Consent (FPIC) and safeguards under Social and Environmental Standards. The link of smallholders to FLEGT/VPA objectives is perhaps less clear. For smallholders to have an impact on illegal logging, for example, their role in the international trade would likely need to be expanded. It can be inferred, however, that the expansion of areas under smallholder plantations in Thailand results in part from a growing demand for timber, including the international market. As demand increases and market supply chains grow to support the export of smallholder timber — in Thailand and elsewhere — so does the potential to reduce illegal logging.

Challenges remain for REDD+ and in FLEGT in monitoring smallholder areas. These areas are often geographically dispersed and smallholders are individuals who do not always have goals in common with each other, let alone with the objectives of REDD+ and FLEGT. Monitoring many dispersed smallholders through TLAS may be difficult and expensive. The same is true for monitoring carbon stock in these plantations. The use of GIS, remote sensing satellite data, web portals and community outreach efforts can support such monitoring efforts. Monitoring, Reporting and Verification (MRV) is required for REDD+. An MRV system may be developed that uses tools to support the quantification of carbon stock, emission factors, and rates of sequestration using scientifically robust and internationally accepted methods (e.g., UNFCCC CDM or VCF).[8] Web-based GIS can be used to aggregate smallholder plantations or small-forest areas under community-based management.[9] Carbon sequestration by smallholder plantations could easily be incorporated into

a REDD+ project where carbon fluxes in projects areas that include smallholder areas as well as forest areas can be measured and monitored as a whole system.

The NSW tracking system to support a TLAS that Thailand is working to develop is similar to a REDD+ MRV system. The NSW design begins at the farmer level (Suwannawimon 2013). Challenges for monitoring smallholders as part of FLEGT efforts are not minor, but countries such as Thailand can draw on past efforts and experiences in monitoring agricultural commodities and building the infrastructure required. In addition, for many commodities there are national bodies, such as the Thai Rubber Association, which can also support monitoring.

The current draft of the R-PP, which Thailand submitted to the FCPF on February 25, 2013, includes a section on civil society organizations. It highlights the Inpang Community Carbon Offset Project, through which smallholders who enrolled in the project sold two years of carbon offsets sequestered in their teak plantations. The subsequent section in the R-PP is "Forest Governance in REDD+," which focuses on the importance of customary rights, user access rights and land tenure. It is followed directly by the statement, "Thailand has been productive in terms of producing legal instruments within the forestry and other Sectors that are both socially progressive and environmentally sound. However, the government has been facing enormous challenges to fully implement these policies and legislation" (GoT 2013). These two short back-to-back sections demonstrate the focus of the Thai government on developing REDD+ capacity, which exemplifies the linkage between FLEGT and REDD+ and the important central role that smallholders and communities can play in both these initiatives.

Endnotes

1. The Inpang Network smallholder trees on farm research was funded by the Asia-Pacific Network for Global Change Science (ARCP2009-09NSY) and the Carbon2Markets program at the Global Observatory for Ecosystem Services, Department of Forestry, Michigan State University. The Mahasarakham Community Forest research was funded by Sustainable Mekong Research Network - Stockholm Environment Institute (Sumernet-SEI). The rubber plantation analysis in Nakhon Phanom Province was supported by the United States NASA Land Cover Land Use Change (LCLUC) Program.
2. This is as of May 2013, according to the EU FAO FLEGT Program web site: www.fao.org/forestry/eu-flegt/78034/en. Retrieved 15 August 2013.
3. This is listed on the World Bank FCPF web site: www.forestcarbonpartnership.org/redd-country-participants. Retrieved 15 August 2013.
4. Sometimes spelled "Inpaeng", the Inpang Network embraces the tenets of the "sufficiency economy" model promoted by Thailand's King Bhumibol Adulyadej. For a good review of sufficiency economy and the Inpang Network, see UNDP 2007.
5. The data are part of a project for Carbon2Markets a program at the Global Observatory for Ecosystem Services, Department of Forest, Michigan State University. Approximately 300 ha of smallholder teak plantation (n = 114) in four different areas in Thailand, including the Inpang member areas, were registered in a carbon accounting system. Two years of

sequestered carbon were purchased by Michigan State University in 2011 as part of its commitment to the Chicago Climate Exchange.

6. Using fixed area field plot inventories, the age of the plantations, and an allometric equation for teak in Thailand developed by Petmark and Sahunalu (1980) the authors estimated the rate of carbon sequestration for the teak plantations to be 10.65 tonnes of CO_2 per ha per year.
7. The carbon in the forest areas was estimated using fixed area field plot inventories and an allometric equation developed for dry dipterocarp forests in Thailand by Ogawa, Yoda and Kira (1961).
8. The United Nations Framework Convention on Climate Change Clean Development Mechanism (UNFCCC CDM) and the Verified Carbon Standard (VCS) publish protocols and methods for forest carbon measurement and monitoring.
9. Examples of such tools can be viewed at www.carbon2market.org and www.goes.msu.edu. MRV systems have been developed for the GEF Carbon Benefits Project and the USAID Forest-PLUS (India) project.

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