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Original article

Increasing Participation in REDD-Plus: A Case Study from Nong Bua Lum Phu Province, North-Eastern Thailand

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ABSTRACT

Lately, under the UN Framework Convention on Climate Change (UNFCCC), there have been discussions on how to incorporate the mitigation efforts of tropical nations in the forestry sector, a process that is known as REDD-plus. As featured at the Fifteenth Conference of Parties (COP15) to the UNFCCC held in 2009, one key element of future REDD-plus is to ensure the broad participation of developing countries. By taking one farmer's plantation activity in Northeast Thailand that achieved wide participation, this study examined how a diverse range of farmers were able to be involved in the activity. Principal component analysis (PCA) was used to analyze the planters' motivation. It was found that their motivation varied with their level of income. For wealthy planters, technical kinds of support were particularly motivational; for medium-income and commercial low-income planters, the economic merits of plantations were a key factor; and for poor farmers, a reliable long-term partnership was found to be essential to them. Therefore, it is suggested, for REDD-plus to be widely accepted, various incentives, including non-economic ones, should be prepared so that a wide range of farmers can participate in such a plantation scheme. Further, it is suggested that REDD-plus could effectively promote farmer's plantation schemes by applying the fund system specifically to enhance a participant's capacity and capability, and the market mechanism to deliver the economic benefits.

Keywords: participation, farmers' plantations, incentives, REDD-plus, Thailand

INTRODUCTION

The international community now widely recognizes the critical role of tropical forests as sources of greenhouse gas emissions and sinks for removals. There have been extensive efforts to incorporate this role within the international treaty on climate change namely, the UN Framework Convention on Climate Change (UNFCCC), (Verchot and Petkova, 2009). In 2005, parties to the UNFCCC first discussed issues related to reducing emissions from deforestation in developing countries at the Eleventh Conference of the Parties (COP11) in Montreal. Later, as part of the Bali Action Plan adopted in 2007, the discussion was extended to cover other forest-related activities under

the new heading of 'Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries' (UNFCCC, 2008). This extended label of discussion has become known as 'REDD-plus' in short.

Various features of REDD-plus were addressed during the latest COP15 in Copenhagen in 2009 including that activities undertaken by developing countries are implemented in phases, depending on the country's circumstances, capacities, and capabilities (UNFCCC, 2009). There were three gradual phases identified: the development of national action plans, policies and measures, and capacity-building; the implementation of policies and measures, and action plans that could demand any necessary capacity-building, transfer of technology and results-based demonstration activities; and results-based actions in full-scale implementation. In addition, the issue was addressed of activities undertaken as part of these steps being appropriately supported by the provision of funds, except for results-based actions which might be supported by a combination of funds and market-based sources (*ibid*.).

While one of the objectives of this phased approach was to make it possible for a wide range of participating countries to become involved in REDD-plus, it is important to recognize that there have been a number of forest-related activities in the tropics that achieved broad participation at the local level in connection with external support. Lessons taken from such experiences are considered useful for the current discussion of REDD-plus, at least, in two dimensions: 1) what factors could motivate the diverse range of participants to take part in the activities, and 2) how the external support could specifically play a role in encouraging broad participation. The present study examined these two points by considering one tree plantation activity in Northeast Thailand. Further, the study discussed how any future REDD-plus could promote farmer's plantation schemes effectively while ensuring wide participation.

Farmers' participation in eucalypts plantations

In Thailand, given an increased demand for the raw materials of pulp and paper since the late 1980s (TPPIA, 2007), there has been a growing number of farmers who planted eucalypts on their land under a contract-like partnership with private companies (for example, Hoamuangkaew *et al*., 1999; Makarabhirom and Mochida, 1999; Ubukata, 2009). In the frequently observed system of a partnership, a company not only promises to purchase timber from farmers, either formally or informally, it also offers a variety of services to participating farmers, including provision of technical know-how and planting materials, such as seedlings (Mayers and Vermeulen, 2002). It was reported that more than 4% of the northeast region of Thailand was covered with eucalypts plantations between 2005 and 2006 (Kasetsart University, 2007). Various studies have explored the popularity of these plantations among some farmers in Thailand, especially in terms of economic competitiveness of plantations as a crop in comparison to other crops, such as cassava and sugarcane (Pousajja, 1996; Niskanen, 1998; Ubukata *et al*., 1998). However, focusing only on the economic benefits of plantations, among other multiple aspects of them, is insufficient to explain why a

large number of farmers with diverse characteristics and circumstances should take part in growing plantations. For instance, rich farmers may find the economic value of plantations is less important than those farmers who are poorer, given their existing high income from other sources. The study conducted by Ubukata (2001) is useful in this respect as its scope went beyond just the 'economic' advantages of plantations; however, the level of its analysis was at the village level, not fully taking into account the diversity of farmers in the villages. The variety of farmers in the context of this study is interpreted in terms of their conditions, characteristics, and ability to participate in plantation schemes and is assessed representatively by income level. There were two reasons for choosing income as an indicator showing the farmers' diversity. First, income can directly influence a number of factors relevant to a farmer's motivation, including: capacity for investment, tolerance to profits with a time lag (as eucalypts take at least four to five years before harvesting), and vulnerability to taking risks. Second, data on income were able to be collected relatively easily in the field; therefore the data could be verified in the subsequent survey. In this study, the motivation of various planters at different income levels was investigated, including that related to the company's interference to promote plantations in the study area.

MATERIALS AND METHODS

Study site

Two adjacent villages, Nikom Nong Chan and Nong Bua Nguen, in the Nong Bua Lum Phu province of Northeastern Thailand, were selected as the study sites. The villages have typical eucalypts plantations which have been established through a contract-like partnership between farmers and a private company since the early 1980s (Figure 1). As shown in Table 1, the content of the company's promotional activities has changed over time (that is, either intensified or weakened), depending on its requirements for eucalypt as raw material. Thirty-one households planting eucalypts, or 10% of the total households in the villages, were surveyed in this study.

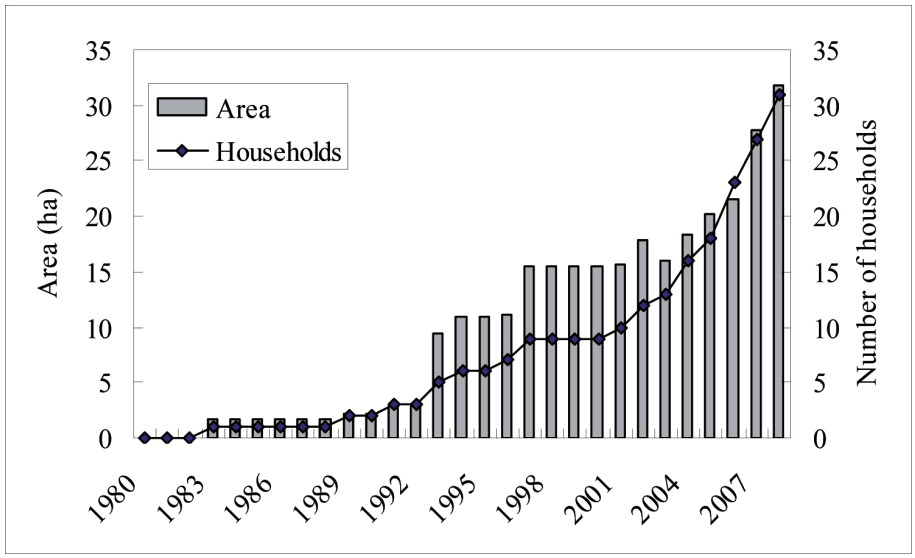

Figure 1 Area of eucalypts plantations and the number of households participating in eucalypts plantations (total sum of 31 surveyed households).

Table 1 Some of the company's promotional activities over time (compiled by the authors)

Before 1990 to 1997	1997-2006	2006 to present
• Distribution of seedlings for free • Provision of technical know-how (e.g. training at company office and on-site) • Information sharing (e.g. seminar at villages)	• Promotion continued as previously on a larger scale • Intensified promotional activities in 2004 and 2005; payment for each planted seedling; free plowing service	• Previous promotion cancelled, except for information sharing • Sale of seedlings

Data collection

Field surveys were carried out twice from February 27 to March 3, 2008 and from July 23 to 28, 2009. In the initial survey, semi-structured interviews were conducted to develop a list of motivational factors that the surveyed farmers identified (Table 2). During the second survey, the surveyed planters were requested to give a score for each of the motivational factors, depending on the significance of each factor to their motivation to join the plantation scheme. This scoring method can identify the motivation of farmers both comprehensively and comparatively.

Statistical analysis

Principal component analysis (PCA) was applied to the collected data on the planters' motivational factors. PCA can explain the characteristics of the sample data space by the newly created dimensionalities, called the principal components (PCs). Then, the results of PCA were analyzed based on the annual income levels of planters; high (above 150,000 baht); medium (between 70,000 and 150,000 baht); and low (below 70,000 baht). There were 8, 10, and 13 surveyed households in each of the income categories, respectively. In the surveyed villages, roughly 75% of the annual income per household came from off-farm sources, such as general employment, and the rest from on-farm sources including plantations.

RESULTS AND DISCUSSION

The results of PCA on the planters' motivational factors are shown in Table 2. Four PCs were identified which jointly explained around 55% of the sample space of data. In accordance with the factor loadings of the given PC, PC-one was interpreted as representing interest in selling, PC-two dependency on or independence from the company, PC-three passiveness, and PC-four strategic attitude about plantations. Using Pearson's correlation coefficient (r), among the four PCs, it was found only PC-three (passiveness) was correlated with income levels (r = 0.375; p = 0.038). This suggested that the higher the level of income, the more passive a planter could be with respect to PC-three. The passiveness of planters was contrasted, represented by PC-three, and their interest in selling explained by PC-one (Figure 2). It was found that the level of passiveness did not determine the level of interest in selling. In fact, with similar passiveness, a planter's interest in selling could be either high or low. However, in the case of the low-income group, it was clear that one sub-group with low income (X), which was more committed to sales, tended to be less passive

than the other sub-group (X'), which was least interested in selling. Therefore, it was considered that aggressive planters with low income tended to be very eager to sell their eucalypts.

Table 2 Principal components of planters' motivational factors.

Motivational factors	Principal component			
	1	2	3	4
Self-consumption	-0.33	0.22	-0.35	0.39
Price is high	0.73	0.15	0.11	0.16
Price is not so high but investment is cheap	0.45	0.33	0.14	0.32
Price is high and investment is also reasonable	0.67	0.36	-0.11	0.01
Price is not so high but stable	0.76	0.24	-0.32	-0.02
Possibility for higher price in future	0.31	-0.73	0.32	0.26
The land was free	0.37	0.36	-0.23	0.40
The land has limited fertility	0.47	-0.22	0.18	-0.02
Suitable for schedule of family	0.50	-0.31	0.10	0.25
Low labor intensity	-0.07	-0.03	0.46	0.58
Technically easy	0.41	-0.27	0.40	-0.38
Good service from other bodies	0.30	0.43	0.49	-0.30
Neighbor has recommended	0.35	-0.50	-0.26	-0.26
Family has recommended	0.49	-0.46	0.01	0.06
Middleman or company has recommended	0.29	0.61	0.44	-0.27
Wanted to try	0.52	-0.06	-0.54	-0.30
For children	0.72	-0.06	-0.17	0.15
Variance (%)	23.15	13.50	9.90	8.03
Accumulated variance (%)	23.15	36.65	46.55	54.58

Remark: 1 = PC-one (Interest in selling); 2 = PC-two (Company-dependency); 3 = PC-three (Passiveness); 4 = PC-four (Strategic attitude).

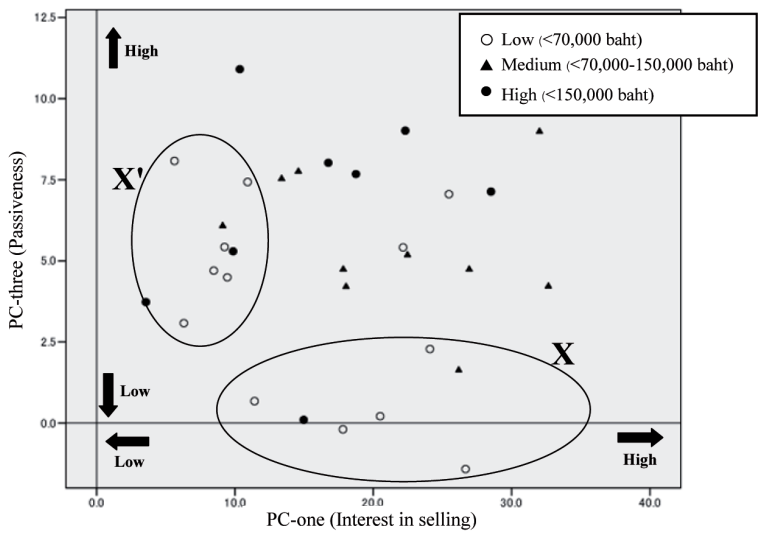

Figure 2 Contrast between interest in selling (PC-one) and passiveness (PC-three)

Dependency on the company's interference, (measured in PC-two), and interest in selling (PC-one) are contrasted in Figure 3(a). The two sub-groups of the low-income group, as identified above, were added to the income categories. It was found that company-dependency appeared to be linearly associated with interest in selling for the group of medium-income and the commercially driven low-income sub-group (A) (that is, as one's interest in selling increases, attachment to the company also increases) (r = 0.589, p = 0.013); no such association was observed for the high-income group and the low-income sub-group without a commercial mind (B) (r = -0.087, p = 0.767). What this could indicate is that while planters in the first group A tend to have a buy and sell relationship with the company, those in B rely on the company irrespective of their business interest. The distinct feature of planters between A and B can be supplemented by the other comparison of PC-two (dependency) and PC-four (strategic attitude) presented in Figure 3(b). It was found that, overall, planters in A were likely to be more strategic and well-planned with regard to planting than those in B; as a result, some farmers in A appeared more independent from the company than planters in B, and given an equal level of company-dependency, planters in A were more committed to selling than those in B.

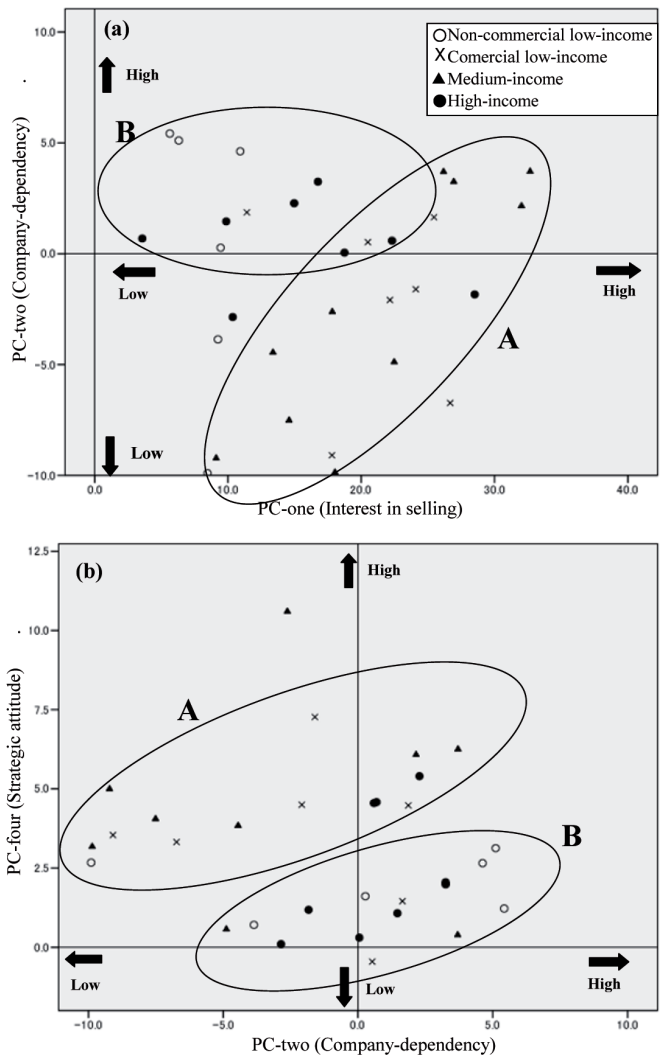

Figure 2 Contrasts between interest in selling (PC-one) and company-dependency (PC-two) in (a); and company-dependency and strategic attitude (PC-four) in (b)

The motivation of farmers participating in plantation schemes in relation to their income levels is summarized in Table 3. It was identified that the surveyed planters with high income and those with low income and without commercial intent were both found to be dependent on the company while being passive and weakly strategic about planting. The apparent difference between the two groups was that with the latter, interest in selling was completely absent from the planters' motivation. On the contrary, planters in the medium-income and low-income business-minded sub-group clearly showed economic interest in plantations, not only from the aspect of an interest in selling but also that of dependency on the company and of strategic attitude.

Table 3 Relative characteristics of planters' motivation in four PCs, classified by income levels.

PC \ Income	High	Medium	Low (commercial)	Low (non-commercial)
Interest in selling	Varied			Extremely weak
Dependency on the company	Generally high	None; or high, if interested in sales		Mostly high
Passiveness	High	Normal	Very weak	High to normal
Strategic attitude	Low to normal	Normal to high		Low to normal

For the reasons already mentioned, income is likely to reflect, to some extent, the diversity of farmers in their circumstances, capacities, and capabilities (a rich farmer is more likely to be better off in all aspects than a poorer farmer to initiate a plantation). First, for the surveyed wealthy planters, it was most likely that plantations were one additional source of income to supplement their existing income flow. Therefore, it was not surprising, as assessed above, that they appeared passive or minimally strategic about planting. Under such conditions, the technical services offered by the company (for example, distribution of seedlings, provision of technical know-how on site) might have been especially effective as they could eliminate any burdens incurred by planters. The identified constant company-dependency of wealthy planters supported this hypothesis. Second, for the medium-income and low-income business-minded planters, plantations were of valuable economic benefit. Given their seriousness and strategic ability with regard to plantations, they tended to be critical about plantation schemes, including the company's interference. The most persuasive reason for them to join plantation schemes was whether the overall economic benefits of plantations were higher than other crops. Lastly, the poorest farmers in this study considered that plantations were one of the important, and probably very few ways of earning income. In addition, it is likely that the technical support of the company assisted them a lot as they may have had limited capacity for investment. These aspects explain why they relied on the company highly even without any interest in selling. The study also found that most of them had started plantations early, before 1997, while the majority of others began after 2004, indicating the reliance on the company by the poorer farmers was not just strong, but also stable over a long period.

The implications of this study for the current discussion on REDD-plus include the observation that different types of incentives can motivate a diverse range of farmers to undertake plantation establishment. This study identified that for wealthy farmers, support on a technical aspect of plantations may be particularly helpful. For medium-income or low-income but business-minded farmers, the economic merits were critically important. For poorer farmers, a reliable partnership over a long term could be a good reason for joining a plantation scheme. Thus, to increase participation in REDD-plus, it is recommended that various incentives, both economic and non-economic, should be offered.

CONCLUSION AND RECOMMENDATION

It was found that a farmer's motivation to join one of the eucalypts plantation schemes in North-eastern Thailand varied in accordance with the farmer's level of income. Recognizing the diversity among the farmers' characteristics, capacity, and capabilities, this study suggested that various types of incentives, including non-economic ones, should be provided to increase participation under REDD-plus. Further, the study indicated that the two types of REDD-plus finance, the fund system and the market mechanism dealing with carbon credits, can be adequately applied, depending on the types of incentives supported. The market mechanism is suitable for meeting the economic desire of planters who are capable of planting (the medium-income and commercially driven low-income planters of this study). The funds, on the other hand, can be used to enhance the capacities or capabilities of farmers who, in the absence of such support, could not participate in plantation activities. In the case of the above study, the provision of technical support for wealthy planters and the establishment of a system to guarantee the stable long-term partnership for poor farmers (for example, a contract-based partnership including price guarantee and an insurance service in case of unexpected incidents) could be supported through the REDD-plus funds.

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