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Economics of NTFPs for the ethnic minority livelihood: The case of “peuak meuak” in northern Laos

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Abstract

Peuak Meuak (*Boehmeria malabarica*), is a source of income for collectors and a growing number of ethnic minority households in Luang Namtha province. It is collected from the forest and also cultivated as a domestic plant and is one of the most significant NTFP exports from northern Laos. Because of the development of roads and bridges in the region, mobility of NTFP traders have greatly improved in tandem with the rapidly growing economy of China. The main aims of this study are (1) to study the potential of “peuak meuak” in poverty alleviation and sustainable rural development under conditions of increased resource scarcity in northern Laos, (2) to study the socio-economic impacts for growers and collectors, (3) to identify the steps in the supply chain of “peuak meuak” and (4) to provide a general view of the “peuak meuak” industry in northern Laos. This study showed that the supply mechanism is reliant upon specific ethnic minority relations as well as different forms of capital that together sustain economic advantages for particular players. Rising demand in China provides sound income opportunities for all actors in the “peuak meuak” supply chain. Growing improved varieties has become a boon for farmers endowed with relatively large land areas with suitable agro-ecological conditions. However, land-poor and landless collectors of wild “peuak meuak” are facing increasing difficulties due to overharvesting, lower prices offered by middlemen, and the rapid conversion of remaining forests into monoculture plantations, especially rubber, which has reduced the natural habitat of “peuak meuak” and other non timber forest products. Currently, farmers increase production of “peuak meuak” through cultivation of “peuak meuak” on plantations under the rubber and teak trees as well as reducing soil erosion and bringing improving land productivity. Due to fast economic changes in Laos, some critical gaps have emerged concerning the sustainability of wild “peuak meuak” and their domestication. Much information is required to enable local users to improve harvesting techniques, and help them in making decisions regarding management and marketing of “peuak meuak”.

1. Introduction

In Laos, 85 per cent of the people live in rural areas and rely on agriculture and forest products for their livelihood (MAF and STEA, 2003). Laos is one of the most

forested countries in Asia and in terms of biodiversity it ranks as one of the richest in the region (GTZ, 2003). Forests are rich sources of food and income for the northern people of Laos (WFP, 2007). The northern of Laos sustains a diverse range of ethnic groups, biodiversity and ecosystems, especially in the highlands. Incidentally, the highest incidence of poverty is also found in highland areas (NAFRI, 2004). Shifting cultivation is the dominant mode of agriculture in the hills. With long fallow cycles, this rotational system provides stable upland rice yields and plenty of wildlife and Non-Timber Forest Products (NTFPs), which thrive in the regenerating forest, fallow (GTZ, 2003). In Laos NTFPs play a very important role in the food security of highland people, and is the main source of cash income for their daily livelihood (IUCN, 2001). NTFPs are particularly important for farmers who are not specialized in cultivation of crops and villagers suffering from seasonal food shortages (Neef *et al.*, 2010). Collection and sale of NTFPs are worth an estimated US\$320 per household per year in northern Laos (NAFRI, 2007). Most of the income from sales of NTFPs is used to buy rice, as rice shortages are a key issue in northern upland livelihoods (Foppes and Phommasane, 2005). However, the availability of NTFPs is threatened by over exploitation and increasing deforestation and landscape degradation (ADB, 2001; Raintree and Soybara, 2001).

The National Poverty Eradication Program of Laos aims to achieve its objectives by improving basic infrastructure and by relocating highland populations to the midlands and lowlands (Lestrelin, 2010; Neef *et al.*, 2010; Thongmanivong and Fujita, 2006). The creation of these new economic zones is often accompanied by large-scale replacement of forestland and traditional swiddens by rubber and teak which has been aggressively promoted by private investors from neighboring countries and the Lao government (Cohen, 2009; Friederichsen and Neef, 2010; Newby *et al.*, 2012). The Lao forestry strategy till the year 2020 has identified the development of the NTFP sub-sector as a national priority as NTFPs are key to the survival of many rural dwellers in Laos (NAFRI, 2004). However, the provincial government of Luang Namtha, is currently planning to replace thousands of hectares of forest land with rubber plantations and, to a lesser extent, sugar cane plantations (GTZ, 2003). This threatens the livelihood base of many communities that depend on forests as sources for food, medicine, construction material, cultural, ecological services and cash incomes. The increasing challenges facing the major actors along NTFP value chains are exemplified in this case study of “peuak meuak”.

“peuak meuak” (*Boehmeria malabarica*), is a small bush which prefers moist, sunny s and is an important source of fiber and medicine. It is both collected from forests and also cultivated as a domestic plant; having been traditionally collected for centuries from native forests and swidden fallows. Previously, local people did not pay attention to this species, and have remained naive to foreign

uses for them in incense sticks, mosquito repellents and also glue. It was simply a source of income and also the one northern Laos’s most significant NTFP export (NAFRI, 2007). Farmers can currently sell dried bark for US\$3-7 per kg. China is the largest raw “peuak meuak” importer from Luang Namtha province, with a value estimated at US\$ 536,438 in 2010. Most is shipped to incense factories in Guangdong, Guanxi, Fujian, Kunming in China (Latsamy *et al.*, 2013).

Today “peuak meuak” is very important in communities with have limited market access and virtually no other source of income. However, uncontrolled harvesting has led to the rapid depletion of wild populations. Planting of “peuak meuak” will ensure regeneration and sustainability. According to NAFRI (2007), harvesting occurs after three years, the whole plant is harvested for its bark and is cut into sections of 0.5m-1m to facilitate transport. One hectare can produce up to 63 kg of dried bark. Attempts to propagate “peuak meuak” from seeds have been unsuccessful, as the seeds are very small and difficult to collect. However, it seems that under natural conditions “peuak meuak” grows better from seeds than from regeneration of existing clumps. Nurseries now mainly use planting material from separated root stock and stem cuttings. “Currently “peuak meuak” plantations cover an area of over 700 hectares in Oudomxay and over 100 hectares in Phongsaly (NAFRI, 2007). In the recent years, production of “peuak meuak” in the entire Luang Namtha district increased with over 140 hectares planted by 2005 particularly in the six villages within the Nam Ha National Protected Area (Latsamy, unpublished).

Despite this potential role of “peuak meuak”, little is known about its marketing in Laos but no further processing takes place in Laos. Moreover, the rural people planting and harvesting of “peuak meuak” in natural forests for commercial purposes cannot sell their production consistently or only sell it at a very low price. Their economic, social and environmental contributions remain largely undervalued and understudied. This is partly due to lack of accurate and comprehensive data on the “peuak meuak” and supply and distribution value chain in Laos. This paper examines the income options of the highland population in northern Laos, with emphasis on the production of “peuak meuak” as a cash plant in Luang Namtha. Hence, the central aim of this paper is to identify all steps in the existing supply chain of “peuak meuak” and its value as an income source, and to evaluate whether promotion of this plant can improve the economic situation of ethnic minority population, especially the poorest groups.

2. Luang Namtha Province (Study Location)

Luang Namtha province was selected as our study area, because they constitute a major area for NTFPs in Laos and

have common natural, social and economic characteristics that indicate high forest dependence.

The location of Luang Namtha province favors ground transportation of “peuak meuak” to China, a market which absorbs most of the harvested produce. This transport takes place either by road or by boat, the province being partly located along the eastern bank of the Mekong River which forms the natural border of Laos with Myanmar in the west.

The study area is the northern province Luang Namtha, one of the poorest regions in Laos and home to one of the

most ethnically diverse population of Southeast Asia (Fig.1). At least 26 from the 47 ethnic groups of Laos live in the region and are classified according to their language families into Lao Tai, Mon-Khmer, Chinese Tibetan and Hmong-Mien. They are still highly dependent on the forest and NTFPs, livestock and relatively traditional lifestyles. Country's least developed provinces, largely because of the conditions in which the various ethnic groups in the mountain villages have lived for generations.



Figure1. Map of the research area in Luang Namtha province.

3. Research Methods and Concepts

Fieldwork for this study was conducted from October-December 2012 in eighteen villages in three of the five administrative districts of the province: Luang Namtha, Nalae and Vieng Phukha. Research sites were selected on the basis of available information from the village administration authority, District Agriculture and Forestry Office (DAFO), Provincial Agriculture and Forestry Office (PAFO), Provincial Trade and Industry Office (PTIO), International Check Point Office (ICPO) and from local informants who knew about the involvement of village communities in the “peuak meuak” enterprise.

In Laos, ethnic groups are commonly classified into three groups based on the altitude at which they are purported to live. According to this scheme, Lao Loum reside in the lowlands and come from the Tai-Kadai language family (ethnic Lao and other Tai-speaking groups, such as the Lue and White Tai, are included in this category). Next are the Lao Theung, who reside in the uplands (mainly Lamet, Mon-Khamu- speaking Khmu in northern Laos). Last are the Lao Soung, who reside on the mountaintops and include the Hmong, Yao, Akha/Ikor and other Tibeto-Burmese groups. This common tripartite classification can be misleading; since lowlander groups frequently reside also in the uplands. For example, in our

study of six Thai Lue villages, the Lao Loum (a lowland group) who practice cultivation of glutinous rice and use of off-farm inputs such as fertilizer and pesticides during dry season are the most dominant ethnic group both politically and economically, in the province, having occupied the more favorite lowland locations with good access to roads and other infrastructure. The seven Lamet villages from Lao Theung (an upland group) are a medium ethnic group in the province who live in the upland area practising shifting cultivation of rice and developing land with rice production potential and also development of sustainable forest-based livelihoods (NTFPs, ecotourism) while strengthening diverse farming systems. The five Ikor/Akha villages from Lao Soung (a highland group) occupy a lower hierarchy and are especially frequent in the province. They are the most distinctively dressed, wearing silver-colored, pointed headpieces and black skirts. They are mainly involved in the development of sustainable forest-based activities (NTFPs, ecotourism) and promote linkages with private sector to stimulate cash crop production. Swidden farming is the primary occupation of the Akha and they historically are major growers of opium.

In the study, both qualitative and quantitative data were collected. To determine the locations for this study area, we organized group discussions and brainstorming sessions which usually comprised of 6-10 key participants including traders,

growers and collectors so as to provide a detailed picture of the activities along the value chain. Various interactive methods with visualizing tools, such as social mapping, seasonal calendars and a Venn diagram by Participatory Rural Appraisal (PRA), were applied in the group discussions.

Respondents were selected on the basis of household use of “peuak meuak” for trade while local trade was determined by estimating the average cash income of selected households in the villages. The four methods used for data collection in this study included household questionnaires, key informant interview, checklist and field observation. Qualitative data was collected by means of semi-structured interviews with individual growers (30), collectors (35) and traders (7) of “peuak meuak” as well as export companies (2) and government officials (4) involved in various steps of the supply chain. A flexible mixture of structured, semi-structured and informal approaches was adopted, drawing on the initial survey information but also incorporating subsequent feedback. Prior to field surveys, the methodology was appraised with each of the team members in Luang Namtha. This ensured that the field teams were clear on the objectives and methodologies of this survey.

Data obtained from qualitative methods were complemented by quantitative data on the incomes and economic status of collectors while grower based secondary information was obtained from the study of wildlife trade by IUCN, (2005). The combination of these two types of data generated a broad understanding of the importance of “peuak meuak” as a cash crop and as a potentially viable income source for the poor. The supply chain study of “peuak meuak” used the same methodology of agro-enterprise development process by NAFRI and CIAT (2010). This allowed clear visualization and description of the flow of “peuak meuak” from raw material to end product.

The data from primary and secondary sources were analyzed by using both qualitative and quantitative methods depending on the nature of the field data. It was interpreted through statistical tools. Descriptive statistics (mean, frequencies and percentage) were used to analyze all quantitative data. Data from interviews were compiled and statistically analyzed by using SPSS and Excel.

4. Results and Discussion

4.1. Collectors of Wild “Peuak Meuak”

“Peuak meuak” regenerates naturally and is mainly found in the uplands of the Northern Province, growing along streams, mountain slopes, in mixed and evergreen forest and fallow lands. Wild “peuak meuak” can be collected in forest areas surrounding the villages with an expanse of 10–250 ha but is usually gathered in forests with a humid environment and varies from stable to depleted resources, according to location. Harvesting practices differ when collecting in the wild, in comparison to their own fields. Distances from villages to wild populations require more than one hour of walking. Everyone is permitted to collect NTFPs for own use

or sale and, in most cases, the entire family goes to the forest to gather wild “peuak meuak” in order to ensure a maximum harvests of this increasingly scarce plant. The classification of forests into *protection*, *conservation* and *production* zones is determined by the Forest Law (DOIN, 2007), but not always recognized by the rural population. Villagers often classify the collection sites simply as ‘forest’. Since property and use rights in the collection areas are not clarified, people from different villages harvest repeatedly at the same known locations. Faced with increasing demand and falling wild harvests, traders have started to advice on sustainable harvesting practices, such as collecting the plants without the roots.

4.2. Producers of “Peuak Meuak” Cultivars

Local people have discovered another solution; most have now turned to intensive management of “peuak meuak”, transplanting seedlings from the wild into private gardens. The extent of this trend is directly related to market access, associated with proximity to the road.

Of the families interviewed from 3 districts in Luang Namtha province, 20 families have a “peuak meuak” garden while others have plans to start cultivating it soon. In remote villages, wild sources remain available and no domestication activities have been reported. Producers cultivate “peuak meuak” in plots at forest edges with an average size of 0.5-1 hectare per family. These plots are usually located within walking distances of 20 to 40 minutes from the village. Land owners are the only ones allowed to plant, harvest and sell the “peuak meuak”. Unlike maize and rice, “peuak meuak” is easy to handle, does not need external inputs and requires little labor. Various problems before and after harvesting were reported by growers. While the plants are not susceptible to insects, yield losses occur sometimes because leaf-eating caterpillar damage the leaves and may slow down its growth but does not seem to kill the plant. Caterpillars and leaves holding their eggs should be removed and destroyed by burning. Further, because the cultivation areas are not fenced, young plants are in danger of trampling and grazing by cattle and buffaloes which wander in the forest.

For the landless and land-poor households, which form the poorest groups in the communities, their ability to shift from collection to cultivation of “peuak meuak” is constrained by lack of land. However even for owners of large land areas, the expansion of “peuak meuak” cultivation is difficult, mainly due to limited availability of shaded, moist habitats suitable for the establishment of plantations inside the forests. This is exacerbated by the fact that the government and private investors, particularly from neighboring China are aggressively promoting rubber plantations, which result in widespread deforestation.

4.3. Collection from the Wild Versus Cultivation of Improved Varieties

This study found that “peuak meuak” enterprise

activities vary between villages (see Table 1). In most places, people who cultivate “peuak meuak” also collect it from the wild. In one study of the Akha village in Luang Namtha district, all activity is concentrated on collection, cultivation and trade. In the two Lamet villages of Nalae district, only collection is practiced, although people from one of the villages are also involved in the trade of “peuak meuak”. In Ban Lao and Hat Lom, a Thai Lue village and Nam Ha, a Lamet village, a higher share of income is generated by the sale of wild “peuak meuak”. In two Thai Lue village’s people concentrate on the trading of “peuak meuak” without being involved in the production or collection. These findings reflect the commercial dominance of the Thai Lue people in supply of “peuak meuak” in the Luang Namtha province. Adoption of cultivation of improved varieties is strongly influenced by the availability of suitable planting sites that provide suitable growing conditions for “peuak meuak”, namely moist areas near streams and forest edges. After harvesting the “peuak meuak” shrub or climber, both wild and cultivated stocks are usually mixed together and sold after drying.

Both advantages and disadvantages can be observed for the harvesting and trading of wild versus cultivated “peuak meuak” (see Table 2). Improved varieties growing on plots that are closer to villages have higher yields, and production volumes are more predictable. This allows individual farmers to agree with traders on the amounts to be delivered, by means of contract farming. Cultivation of “peuak meuak” is more profitable than collection from the wild and provides exclusive ownership and user rights.

Table 1. Activities in the “peuak meuak” enterprise in the study villages.

District	Village	Ethnic group	Collection	Cultivation	Trade
Luang Namtha	Nam Sa	Akha	✓	✓	✓
	Hoi Hok	Akha	✓	✓	
	Nam Ha	Lamet	✓	✓	✓
	Lakham Mai	Akha	✓	✓	
Na Lae	Ban Om	Lue			
	Ban Lao	Lue	✓	✓	
	Hat Lom	Lue	✓	✓	
	Nalae	Lue			✓
	Hatthe	Lue			
	Nong Kham	Lue			✓
	Phochalae	Lamet	✓		✓
	Sa Loiy	Lamet	✓		
	Nam Sheua	Akha	✓		
Vieng Phukha	Nam Fa	Akha			
	Nam Long	Lamet	✓	✓	
	Pho Lan	Lamet	✓	✓	
	Nam Ngang	Lamet	✓	✓	✓
	Nam Lan	Lamet	✓	✓	✓

Source of data: Household’s survey 2012

4.4. Structure of the “Peuak Meuak” Trade

There seems to be three main locations that “peuak meuak” are gathered and traded in Luang Namtha province. Road access to these locations is one of the main factors that influence “peuak meuak” trading activities. Types of transportation in the three locations have been geographically shaped by the government roads, especially the new road No.3. Luang Namtha District and Province are the main locations where most “peuak meuak” in the National Protected Area and other villages in Luang Namtha and Na Lae District are transported before they reach the final markets. It is found that large amounts of peuak meuak are sent to Luang Namtha by private vehicles. After that, this “peuak meuak” will be sent to China by private vehicles.

Table 2. Ecological sustainability of “peuak meuak” between wild and domesticated.

No.	Collected from the wild	Cultivated as domesticated plant
1	Destructive harvesting, medium to long regrowth few special ecological requirements	No effect of harvesting on stand, fast regrowth but requiring special surrounding
2	Stocks are being depleted	Very sustainable if maintained
3	Collection areas often distant from the village and access to the collection sites is time-consuming	Plantations are usually within walking distance to the village
4	Wild varieties produce smaller shrub or climber and lower yields	Cultivated varieties produce larger climber and higher yields by activity managed
5	Individual plants distributed over large forest areas and cut stems all bark from stems and uproots. Not sustainable and under threat	All bark from stems, plants are not uprooted, regeneration from the roots parent clump and high planting densities generate
6	Dependency on the availability of forest land, which is in decline in Laos	Plantations within production forests and in rice or corn fields near streams
7	Undefined tenure rights in collection areas lead to increased competition and premature harvesting	Only the owner of the plot has harvesting rights but fencing is required to keep cattle out.
8	Annual fluctuation in harvested amounts	Production volumes are predictable, depending on the season
9	Lower prices paid by traders	Higher prices paid by traders for improved varieties

Source of data: Villages’ survey 2012

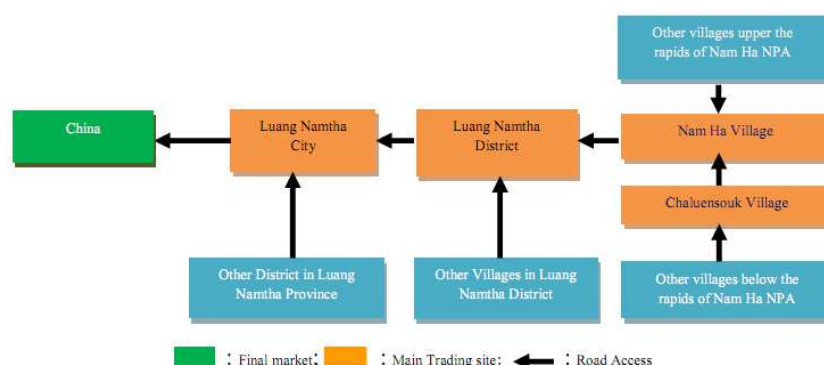


Figure 2. Location of “peuak meuak” trade in Luang Namtha province.

North of Luang Namtha towards China, at the borders of Boten-Mohan (Laos-China) the market value for “peuak meuak” is high. Luang Namtha to the border in Boten is just 56 kilometers away and travel by the road No.3 takes only half an hour by car. There are also several buses travelling to Boten daily, from Luang Namtha. Luang Namtha is the main economic city on the province of Luang Namtha in Laos.

4.5. “Peuak Meuak” Market Chains in Luang Namtha Province

The supply chain in Luang Namtha province begins with the farmers (collectors) in the villages and then moves

towards the end consumers (involves four groups of stakeholders). The chain includes local collectors, who pick the “peuak meuak” from the wild and also cultivated stock who then sells it on to traders (village trader, large-scale traders and Chinese enterprises trader). The potentials and vulnerabilities encountered in each step of the “peuak meuak” market chain are explained in Figure 3. At each step along this chain ‘market players perform the functions of buying, selling and transporting. It is important to recognize the functions these players perform and their importance to the overall chain because the action of each player along the chain can affect all the others.



Figure 3. “Peuak meuak” Market Chains in Luang Namtha Province.

4.6. Evaluation of the Supply Chain

Various factors influence the view on “peuak meuak” as a cash plant, as well as the activities of the various stakeholders involved in its supply chain. In general, the involved parties assign positive attributes to “peuak meuak” as an enterprise (see Table 3). They state that it is an easy plant to handle, without major production and marketing risks and generates profit at all levels of the supply chain.

4.7. Market Demand

High demand, which exceeds current supply, is the main driver for adoption of “peuak meuak” production. Accordingly, prices have trended upwards in recent years, particularly due to rising demand in the Chinese market.

China is the largest “peuak meuak” importer from Luang Namtha province. Based on available Provincial Trade and Industry Office data, the Luang Namtha price of “peuak meuak” products increased from 2005 to 2011 because wild production stock are being depleted (see Figure 4 and 5) but Chinese importers never receive sufficient supplies and would like “peuak meuak” production to increase.

4.8. Access to Markets and Infrastructure

Marketing of NTFPs in Lao PDR has increased over the past several years. This is because of the improved mobility of NTFPs traders resulting from the development of transport infrastructure in the northern part of Lao PDR, which is of strategic importance as it links the region to

China, Myanmar, Vietnam and Thailand. As a consequence, the volume and speed of exports of NTFPs has been increasing. “Peuak meuak” prices are influenced by the location of the collection and production villages and their accessibility to the national road network. Table 4 shows the prices of dried “peuak meuak” in the villages of the three districts studied. Marked price differences were observed in the three districts.

Table 3. Evaluation of the “peuak meuak” business by the main stakeholder groups.

Feature	Collectors	Producers	Traders
Costs		Low investment costs and access to planting material is ensured.	
Labor	No need for re-planting. Harvest in the season where labor is available	Low labor demand. No weeding and fertilization needed.	Easy handling of the product (acquire from villagers or middlemen)
	The entire family can participate in collection from the wild	Harvesting from October-June and harvest (labor is abundant)	High value per weight compared to other plant
Inputs	The plant is growing as a natural resource inside protected forest	Plantations expand after initial planting and can be harvested for up to 20 years. No re-planting is required, no further input after initial investment.	Acquired from villages together with other plant and NTFPs

Source of data: Household’s survey 2012

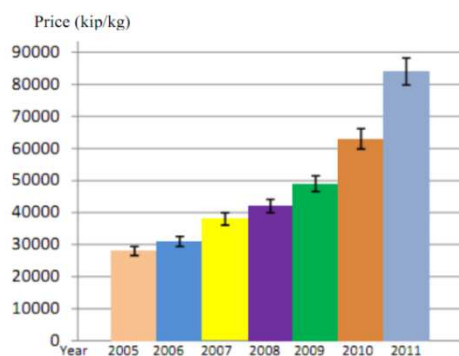


Figure 4. Price development for “peuak meuak”.

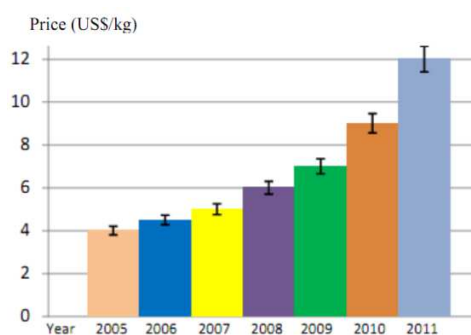


Figure 5. Price development for “peuak meuak”.

The highest prices were paid, at the borders Boten-Mohan (Laos-China), which is closest to China indicating that proximity to the country of export is influencing the price positively. Little “peuak meuak” is collected from the wild in this district, and most sales refer to improved cultivated varieties. The lowest prices for “peuak meuak” are offered in the remote Nalae district. Most of the “peuak meuak” marketed from this district comes from the wild. It is located farther away from the borders to China, making access by traders more difficult, and consequently raising transportation costs. However, new roads are under construction in this district, and with the new infrastructure, more marketing channels to Thailand via Bokeo province will be opened. With the demand in Thailand, as reported by Yokoyama (2010), a new marketing network could be developed, involving traders other than the ones engaged with exports to China.

Table 4. Prices paid by traders to producers and collectors of “peuak meuak” in 2011.

Type of supplier	Village	Ethnic group	Price (Kip/kg)	Price (US\$/kg)	District
Producers	Na Lan	Lamet	80,000	11.40	Luang Namtha
	Nam Ha	Lamet	85,000	12.00	
	Chaluensouk	Lamet	85,000	12.00	
	Nam Toung	Lue	85,000	12.00	
	Nam Sa	Akha	80,000	11.40	Vieng Phukha
	Hoi Hok	Akha	80,000	11.40	
	Nam Ngang	Lamet	75,000	10.70	
	Nam Fa	Akha	75,000	10.70	
Collectors	Ban Lao	Lue	70,000	10.00	Nalae
	Hat Lom	Lue	70,000	10.00	
	Phuchalae	Lamet	65,000	09.28	
	Sa Loiy	Lamet	65,000	09.28	

Source of data: Households’ survey 2012

4.9. Beneficiaries of the “Peuak Meuak” Enterprise

Contribution of “peuak meuak” to Household Income

Sales of surplus farm, off-farm and a variety of NTFPs form the income base of the rural communities in northern upland Laos (see Table 5, 6 and 7). These sources usually vary between villages but not within villages. Producers and collectors were divided into quartiles based on their cash income. Analysis of the income quartiles revealed the groups that benefited most from the sale of “peuak meuak” and the percentage of their income earned from it.

Table 5. Farm income sources in villages where cultivation of “peuak meuak” and collection from the wild occurs.

Supplier	Village	Upland rice	Rubber	Maize	Poultry	Pig	Cow	Buffalo
Producers	Na Lan			✓	✓	✓		
	Nam Ha	✓			✓	✓	✓	
	Chaluensouk	✓			✓	✓	✓	
	Nam Thoung	✓	✓	✓	✓	✓	✓	✓
	Nam Sa		✓		✓	✓		
	Hoi Hok	✓		✓		✓	✓	
	Nam Fa		✓	✓	✓	✓		
Collectors	Nam Lan				✓	✓		
	Ban Lao	✓	✓	✓	✓	✓	✓	
	Hat Lom		✓	✓	✓	✓	✓	✓
	Phuchalae	✓		✓	✓	✓		✓
	Sa Loiy	✓		✓	✓	✓	✓	✓

Source of data: Households’ survey 2012

Table 6. Off-farm income sources in villages where cultivation of “peuak meuak” and collection from the wild occurs.

Supplier	Village	Forest product	Small business	Ecotourism	Employee	Handicraft	Salary
Producers	Na Lan	✓		✓			
	Nam Ha	✓	✓	✓			
	Chaluensouk	✓		✓	✓		
	Nam Thoung	✓	✓			✓	✓
	Nam Sa	✓		✓			
	Hoi Hok		✓				
	Nam Fa	✓			✓	✓	
Collectors	Nam Lan			✓	✓		
	Ban Lao	✓	✓			✓	
	Hat Lom	✓	✓		✓	✓	
	Phuchalae	✓			✓	✓	
	Sa Loiy	✓			✓		

Source of data: Households’ survey 2012

Table 7. NTFPs income sources in villages where cultivation of “peuak meuak” and collection from the wild occurs.

Supplier	Village	Cardamom	Broom grass	Rattan	Het daeng	Nok khom	Peuak meuak
Producers	Na Lan						✓
	Nam Ha	✓		✓		✓	✓
	Chaluensouk	✓		✓		✓	✓
	Nam Thoung	✓					✓
	Nam Sa	✓	✓	✓	✓	✓	✓
	Hoi Hok		✓	✓			✓
	Nam Fa	✓		✓	✓	✓	✓
Collectors	Nam Lan				✓		✓
	Ban Lao	✓				✓	✓
	Hat Lom	✓				✓	✓
	Phuchalae	✓			✓		✓
	Sa Loiy	✓	✓	✓	✓	✓	✓

Source of data: Households’ survey 2012

Table 8. Highest and lowest cash income quartiles, cash income range and average cash income in the research sites (collectors: n=35, producers: n=30).

Type of supplier	Cash income range (Kip/year)	Group average (Kip/year)	Group average (US\$/year)
Collectors	High income	18,193,500-23,124,343	3,303
	Low income	<12,581,524	1,797
Producers	High income	27,424,500-30,591,202	4,370
	Low income	<19,780,388	2,826

Source of data: Households’ survey 2012

Source: Lao Development Bank: Currency exchange rate: 1 US\$=7,000 kip

The highest and lowest quartiles of both groups are indicated in (Table 8). Findings suggest that relatively lower incomes correlate with collection of “peuak meuak” from the wild.

One-way analysis of variance (ANOVA) determined the dependence of the income groups on direct sales of “peuak meuak”. Annual revenues were compared to those generated by the sale of other products, in order to evaluate the percentage contribution of “peuak meuak” to the annual income for year 2011 (see Fig. 6). The highest share of “peuak meuak” in total cash income is found among both producers and collectors of the lower income quartile. No statistical differences could be observed between producers

in the high and low income class. High income producers depend to a lower share on “peuak meuak” than the high income collectors. Low income collectors obtain a significantly higher percentage of their income from “peuak meuak” than the other income classes ($p = 0.05$).

Figure 6 shows the share of total cash income (in %) from “peuak meuak” sales in 2011 for producers and collectors, distributed over income quartiles (producers: $n=30$, collectors: $n=35$). Note: Numbers above the bars indicate the outcome of the statistical analysis. Letters indicate statistical differences, and values followed by the same letter are not significantly different at $p=0.05$; Q= Average for this group.

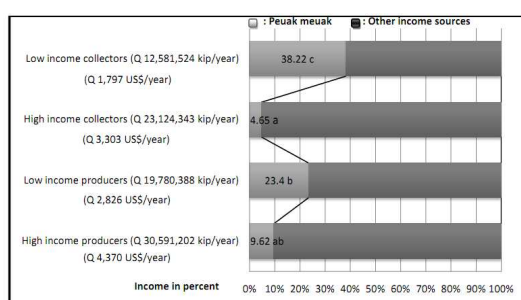


Figure 6. Share of total cash income (in %) from “peuak meuak” sales in 2011 for producers and collectors.

4.10. Benefits in Areas where Cultivation of “Peuak Meuak” Predominates

Table 9. Share of “peuak meuak” in the annual household cash income for 2011 in two villages that cultivate the plant.

Type of commodity	Nam Thoung (Lue: $n=8$)		Nam Fa (Akha: $n=11$)	
	Average household income (Kip/year)	(%/year)	Average household income (Kip/year)	(%/year)
Upland rice	2,712,000	7.2	0	0.0
Rubber	5,198,000	13.8	2,290,894	12.0
Maize	3,164,000	8.4	1,145,447	6.0
Poultry	1,582,000	4.2	610,905	3.2
Pig	2,636,666	7.0	1,069,084	5.6
Cow	3,201,666	8.5	2,348,167	12.3
Buffalo	4,143,333	11.0	0	0.0
Forest product	2,335,333	6.2	1,966,351	10.3
Small business	1,506,666	4.0	0	0.0
Ecotourism	0	0.0	458,179	2.4
Handicraft	2,335,333	6.2	0	0.0
Salary	3,955,000	10.5	0	0.0
Cardamom	2,636,666	7.0	2,634,530	13.8
Broom grass	0	0.0	1,049,994	5.5
Rattan	0	0.0	572,724	3.0
Het daeng	0	0.0	1,202,720	6.3
Nok khom	0	0.0	1,036,190	5.6
Peuak meuak	2,260,000	6.0	2,590,475	14.0
Total	37,666,663	100.0	18,975,660	100.0

Source of data: Households' survey 2012

To determine the importance of cultivated “peuak meuak” for income generation compared to other income sources, two fairly dissimilar villages in terms of wealth, Nam Thoung (Luang Namtha district) and Nam Fa (Vieng Phukha district) were chosen. The average household cash income and its sources are depicted in Table 9.

Nam Fa is has the lower income. In this village, ho Nam Thoung ranks higher in average household income. In this relatively wealthy village, cash income sources are less diverse and people rely only on the cash sale of farm products, including “peuak meuak” and cardamom, as well as the sale of livestock. The highest share of income is generated by the sale of rubber, maize, followed by large ruminants (cow, buffalo), non-ruminants (poultry, pig) and cardamom. “Peuak meuak” contributes only about 6 % of the total annual cash income.

usehold income is generated from a wider diversity of sources. “Peuak meuak” accounts for about 14 % of the total income, approximately the same as wild cardamom, while broom grass, rattan, “het daeng” and “nokkhom” together contribute about 20 %. Hence, the collection and sale of NTFPs contributes more than one third of the annual income, with the remainder generated by the sale of farm including rubber, maize, poultrys and pigs and also the income from forest product and ecotourism. While the relative share of income generated by “peuak meuak” in Nam Thoung is lower than in Nam Fa, in absolute terms it is more than two times as high.

4.11. Benefits in Areas where “Peuak Meuak” is Mainly Collected from the Wild

Table 10. Share of “peuak meuak” in the annual household cash income in two villages that collect p. from the wild.

Type of commodity	Hat lom (Lue: $n=8$)		Sa Loi (Lue: $n=8$)	
	Average household income (Kip/year)	(%/year)	Average household income (Kip/year)	(%/year)
Upland rice	0	0.0	2,584,000	15.3
Rubber	6,205,000	24.2	0	0.0
Maize	4,615,289	18.0	1,553,778	9.2
Poultry	1,282,025	5.0	608,000	3.6
Pig	2,564,049	10.0	1,688,889	10.0
Cow	3,846,074	15.0	2,448,889	14.5
Buffalo	4,051,198	15.8	2,263,111	13.4
Forest product	769,215	3.0	1,351,111	8.0
Small business	256,405	1.0	0	0.0
Employee	948,698	3.7	472,889	2.8
Handicraft	256,405	1.0	0	0.0
Cardamom	384,607	1.5	709,333	4.2
Broom grass	0	0.0	439,111	2.6
Rattan	0	0.0	253,333	1.5
Het daeng	0	0.0	743,111	4.4
Nok khom	51,281	0.2	253,333	1.5
Peuak meuak	410,248	1.6	1,520,000	9.0
Total	25,640,494	100.0	16,888,889	100.0

Source of data: Households' survey 2012

Income sources and distribution in villages in Nalae district where “peuak meuak” is collected from the wild, (see Table 10) differ substantially from the “peuak meuak” cultivating villages.

Hat Lom is the richest villages where collection from the wild occurs. Sales of “peuak meuak” collected in this village contribute less than 2 % to overall income, compared to other income sources including planting rubber, maize cultivation, raising buffaloes, cows, pigs and poultry which together contribute more than 85 % of the annual income. Respondents reported that they will grow “peuak meuak” under the rubber and teak tree because “peuak meuak” from the wild varies from stable to depleted resources, according to location. If they grow this plant under the rubber and teak trees, it climbs rapidly up the trees and produces larger and darker leaves at the lower part of the plant, with smaller leaves higher up. Climbing plants also have thicker and longer branches, stems and roots.

Sa Loi, by contrast, ranks among the poorest villages where collection of “peuak meuak” occurs. In this village, household incomes stem predominantly from sales of rice, cows, buffaloes, pigs, maize, poultry and forest product, while “peuak meuak” accounts for about 9 %, more than 9 times as high as the share in Hat Lom. In summary, data from Tables 9 and 10 suggest that poorer households and communities tend to rely more on the “peuak meuak” business for sustaining their livelihoods than the more affluent ones.

5. Conclusions and Recommendations

Many ethnic minority groups rely on NTFPs for cash income. These commercialized forest products are, however, largely bought and sold as raw products. The hopes for success, in terms of raising local incomes, are pinned on the creation of sustainable production, processing and marketing mechanisms. Potentially high-value products, such as “peuak meuak”, are constrained by the difficulty in developing ways to add value and thereby increase the benefit to harvesters.

“Peuak meuak” presents an interesting case with potential to enhance rural livelihoods and promote sustainable land use in upland areas of northern Laos. It delivers high annual yields and is an important income supplement for rural households. Moreover, “peuak meuak” production enhances the temporal diversification of income generation, since harvesting occurs before that of rice and maize, thus balancing the labor requirements for rural families. Existing market channels are well developed and coupled with continuing improvements in transportation infrastructure can open up new opportunities through trade for exports.

Cultivation of “peuak meuak” can be an option for rural

people with land rights and an ability to bear the necessary investment costs, namely for seedlings and labor. Traditionally, collection from the wild has been a more viable option for the poorer parts of the rural populations that do not have access to land and capital. Yet with the ongoing depletion of wild “peuak meuak” populations as a consequence of the expansion of rubber plantations, this opportunity is rapidly diminishing. Shifting from collection to cultivation of “peuak meuak” could be a solution that delivers incomes when collection from the wild becomes impossible. In doing so, farmers need to consider their land endowment and the labor capacity of their families, as well as the fact that different varieties of “peuak meuak” have different agro-ecological requirements.

Access to the markets through improvement of road and infrastructure would definitely accelerate the trade of these natural resources. Local people are likely to increase their effort to search for natural products that they could sell. Consequently, sustainable use of the natural resources poses a great challenge for the government and local communities.

It is necessary to clearly understand the trading system of these resources. This is one of the main factors that have a major impact on the level of resource utilization. The study of trade and interaction among different stakeholders involved in trading activities of the natural resources provide valuable data and information for the management planning of these resources. The presence of the various plant species in trade and the level of exploitation in the marketing study could be one of main indicators for monitoring environmental and natural resources.

Lao traders and producers badly need more information on these cross-border markets. For China, the main gate to Laos is through Yunnan Province. Strategies for improving “peuak meuak” -based activities in the province would be very interesting and help to develop initiatives for marketing research on cross-border marketing chains for province products, in collaboration with Chinese marketing research organizations besides on analysis marketing chain, opportunities of marketing and “peuak meuak” product seasonality.

Research on appropriate drying facilities that can be communally organized is needed for improving post-harvest handling and product quality. Monitoring the drying facilities and estimating the necessary monetary and labor inputs are also essential. The acute focus on cultivation of imported improved varieties has an impact on the population genetics of wild “peuak meuak”. These effects should be considered and studied with a view to improving the resilience of the plant system, as local varieties are gradually neglected. Participation of rural communities in research forms the basis for the development of value chains of more plant products that may follow the supply demand patterns of “peuak meuak” in the future.

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