

## Forest, Ethnicity and Settlement in the Mountainous Area of Northern Laos \*

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### Abstract

This paper aims at clarifying the relationship between traditional forest use, ethnicity and settlement location in the mountainous area of northern Laos, by observing cash income activities, focusing particularly on non-timber forest product (NTFP) gathering.

As ethnic Lao settlements are located along the river, many households engage in non-agricultural activities. Khmu settlements are located throughout the whole region, with agriculture as the main activity of most households. Hmong settlements are located only in mountainous areas; almost all households have both rice farming and opium poppy cultivation as main farming activities.

The most important activity contributing to cash income is NTFP gathering. A large quantity of NTFPs is grown as secondary vegetation after burning the forest for swidden agriculture. The most notable of these is the styrax tree (*Styrax tonkinensis*) which produces a balsamic resin known as benzoin. As a regeneration of styrax trees is performed in combination with swidden agriculture, this land use system of combined benzoin gathering and swidden agriculture is comparable to the concept of an agro-forestry. This type of forest use has long been practiced in the study area. However, the present study shows that this agro-forestry mode of forest use, or indigenous sustainable forest use system, is at risk of collapse, due to political regulations against forest utilization.

**Keywords:** northern Laos, fallowed swidden, non-timber forest product (NTFP), *Styrax tonkinensis*, benzoin, agro-forestry

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## I Introduction

According to the Participatory Poverty Assessment surveyed by the Asian Development Bank [Lao P.D.R., Asian Development Bank 2001: 76], yearly rice sufficiency averaged only a total of 6.8 months in 45 districts counted as poor, despite the fact that rice is a staple food for all Laotian ethnic groups. Most of the poor districts are located in mountainous areas and are practicing swidden agriculture. Villagers who have a shortage of rice in mountainous areas must obtain cash from additional other economic activities in order to purchase this staple. With regard to cash income activities of the rural people of Laos, Foppes and Khetphanh [1997: 7–8] state that a high-income household mostly earns income from live-stock, while a low-income household largely depends upon forest products. It can also be seen from the result of a study in a southern rural area by Hyakumura [2000: 28], that as household economic level becomes lower, cash dependency from the forest becomes higher. Thus, the forest plays a significant role in generating income for rural people in Laos, especially for the poor.

Following the passage of the Forest Law in 1996, Laotian forest land was divided into five classifications: protection forest, conservation forest, production forest, regeneration forest and degraded forest. The gathering of any forest product—including non-timber forest products (NTFPs)—is not permitted in the protection forest and conservation forest zones. By contrast, according to Article 16–22 of the Forest Law, it is possible for individuals and households to be allocated forest land of up to three hectares of degraded forest. However, the intention of the Laotian government is to convert to commercial forest land and/or agricultural land; consequently, no forest whatsoever is allocated for swidden agriculture or places for NTFP gathering. Only customary use of forest and forest lands under the auspices of the village administration is allowed for family use and for other traditional use by Articles 30 and 63 of the Forest Law. Due to these factors, the customary system of forest use and management has begun to garner more attention [Anonymous 1999: 45–47].

Chanthirath [2000: 318–324] showed that 38 species of trees, 29 kinds of NTFPs and 8 species of wild animals are commonly used by local people in the Vang Vieng district in Vientiane province, and also showed that 16 out of 38 species of trees, 9 out of 29 kinds of NTFPs, and 3 out of 8 species of wild animals are found in fallowed swiddens. Takeda [2001], who studied the benzoin obtained from styrax trees (*Styrax tonkinensis*) in a mountain village of Luang Phabang province, presented a suggestive observation that benzoin has been gathered by villagers using the agro-forestry system in combination with swidden agriculture, due to the fact that the styrax trees grow as the dominant species at an early stage of the fallow period when regular forest burning is performed.

Although it is easy to evaluate the utility and economic value of agricultural field and forest land, it is difficult for fallowed swidden to be evaluated, as this type of land is at an interim step between agricultural field and forest. Thus, discussions concerning fallowed

swidden have rarely been held. Moreover, previous studies have not presented comparative data which takes into consideration differences between villages, and has usually failed to grasp issues involving ethnic differences. In fact, more than 60 ethnic groups are mosaically settled in Laos [Chazée 1999]. Settlement location is varied in altitude—from lowland to highland—by each ethnic group, and forest use will conceivably differ, depending upon the settlement location. Although a large number of studies have been made which consider the relationship between forest use and ethnicity [*e.g.*, Anderson 1993; Kunstadter, Chapman and Sabhasri 1978; Walker 1975; Yin 2001], there have been no studies which have analyzed the interrelation between forest use, ethnicity and settlement location from a spatial point of view.

Therefore, this paper focuses on forest and forest-related space such as swidden fields and fallowed swidden; as well, traditional forest use in northern Laos is discussed with relation to ethnicity and settlement location.

## II Occupation Structure in the Northern Mountainous Area

### II-1 *Settlements in the Study Area*

This study focused on the Pak Luang sub-district of Ngoi district in Luang Phabang province, as it represents something of an epitome of the mountainous area of northern Laos, where three ethnic groups, ethnic Lao,<sup>1)</sup> Khmu and Hmong, live in the same area, and villages are located ranging from lowland to highland (Fig. 1). The minimum altitude in the study area is that of the Ou riverside, at approximately 400 meters. The highest peak is Mt. Pha Onng, located in the southwest of Fig. 1, some 1,267 meters above sea level. The study area features a mountainous landscape.

In terms of the classification of ethnic groups in Laos, the following three categories<sup>2)</sup> have been established, depending upon habitat location: *Lao Lum* (Lowlander), *Lao Thoeng* (Midlander), and *Lao Sung* (Highlander). If this method of categorization is compared to the ethnic groups in the study area, *Lao Lum*, *Lao Thoeng* and *Lao Sung* correspond to ethnic Lao, Khmu and Hmong respectively.

In the Ngoi district, the administrative classification of “sub-district” was introduced by the district office; Pak Luang sub-district includes of 14 villages consisting of 23 settlements, of which 16 settlements were surveyed. Until the mid-1990s, the study area had 21 villages

- 1 ) The ethnic Lao belongs among the Tai-Kadai ethno-linguistic family, and they are the most numerous ethnic group in Laos. An official ethnic name of them is “Lao,” but it is often confused with “Lao” which stand for the Lao nation without distinction of ethnic group. This paper describes them “ethnic Lao” to avoid such a confusion.
- 2 ) These distinctions are not a formal classification in the opinion of the government. Nevertheless, these categories are used not only in public discourse as a kind of report but also in academic papers.

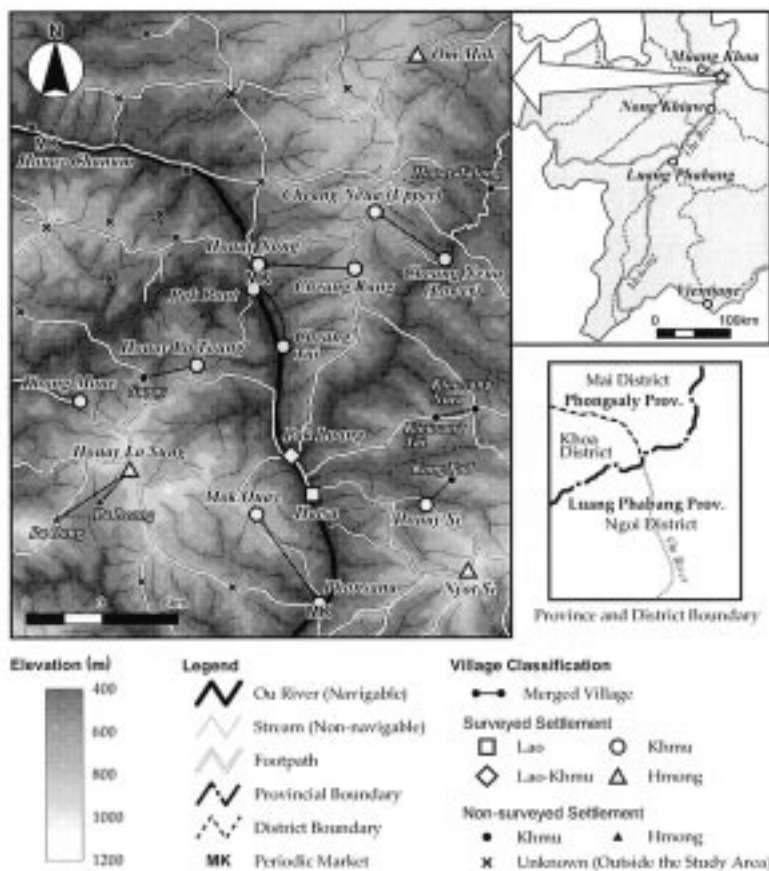


Fig. 1 Settlement Locations in the Study Area, 2001

Source: Lao P.D.R., National Geography Department 1/100,000 Topo-graphical Maps, B. Ngoi-Nua and Khoa (1983) and Aerial Photographs (1999), and field survey by the author using GPS

consisting of 22 settlements. The reason for the change in village and settlement numbers is that the district office carried out village merging following a government decree (No.102/PM, “Decree on the Organization and Administration of Villages”), which states that: “any area comprising less than 20 households is placed under a neighboring village.” In the study area, many villages consist of two or more settlements, and the geographical location of each settlement is completely different. Hence, this paper uses not “village” but “settlement” as a unit-term for discussion in the text.<sup>3)</sup>

Profiles of the 16 settlements studied are shown in Table 1. The ethnic composition of

3 ) Om Mok village, Khong Mone village, Pak Luang village, Hatsa village, and Nyot Si village are using the term “village” because one village is formed in one settlement, and the others are using the term “settlement.” However, the term “village” is used in case of discussing the administrative village formed in some settlements.

**Table 1** Occupations of Studied Settlements, 2001

Village (Settlement)	Location	Population	Ethnic Group	Household	Occupations (Household)				
					Agricultural Activity *	Technically-skilled Jobs **	Brokerage	General Store	Public Servant ***
Cheang Neua (Upper)	Mountain	168	Khmu	28	28	0	0	0	0
(Lower)	Mountain	172	Khmu	30	30	0	1	0	1
Cheang Kang (Cheang Kang)	Mountain	248	Khmu	45	45	0	1	0	1
(Houay Nong)	Riverside	109	Khmu	20	20	0	1	0	1
Phonsana (Mok Ouay)	Mountain	229	Khmu	33	33	0	0	0	0
(Phonsana)	Riverside	315	Khmu	51	49	0	2	0	3
Pak Bout (Pak Bout)	Riverside	135	Khmu	26	25	0	5	0	1
(Cheang Tai)	Riverside	110	Khmu	27	27	0	0	0	1
Houay Si	Mountain	173	Khmu	39	39	0	0	0	1
Houay Lo Toung	Mountain	138	Khmu	30	29	0	0	0	1
Houay Lo Sung	Mountain	154	Hmong	23	23	0	0	0	1
Om Mok	Mountain	139	Hmong	19	19	0	1	0	0
			Lao	1	0	0	0	0	1
Hatsa	Riverside	270	Lao	57	26	3	11	15	4
			Khmu	3	3	0	0	0	0
Pak Luang	Riverside	188	Lao	21	10	1	6	5	1
			Khmu	15	15	1	0	0	1
Nyot Si	Mountain	225	Hmong	34	34	0	0	0	0
			Lao	1	0	0	0	0	1
Khong Mone	Mountain	211	Khmu	40	39	0	0	0	1
Total <sup>#</sup>		2,984		543	494	5	28	20	20

Source: Surveyed and interviewed by the author

\* All farmers are practicing swidden agriculture in the study area.

\*\* Two carpenters, a blacksmith, and two boat-making craftspeople existed in the study area.

\*\*\* Public servant is including teachers and a nurse who are being dispatched by district office.

<sup>#</sup> Total number of occupations is not equal to the number of households, because some households are doing more than one activity.

those settlements is formed of four different types: 11 Khmu settlements; 3 settlements consisting almost entirely of Hmong; 1 settlement consisting almost entirely of ethnic Lao; and 1 settlement with intermingled ethnic Lao and Khmu. Two Hmong settlements, Om Mok village and Nyot Si village, contain only one ethnic Lao household each. In both cases, these are single-person households dispatched by the district education office for primary schoolteachers. The others are all Hmong households. There are 3 Khmu households in Hatsa village, although this paper considers this village as an ethnic Lao village, because the ethnic Lao form the overwhelming majority of the population. As of the end of 2001, in the study area, the number of households was 543 and the population was 2,984 in total; the ethnic structure ratio of Khmu, ethnic Lao, and Hmong was 69.8 percent, 15.5 percent and 14.7 percent respectively.

## II-2 *Characteristics of Occupation Structure*

The main economic activity in the study area is agriculture: about 91 percent of households are engaged in agricultural activities such as rice farming, cash crop cultivation and live-stock raising<sup>4)</sup> (Table 1). Non-agricultural activities are comprised of technically-skilled jobs, agro-forestry products brokerage, general store management and public servant activities.

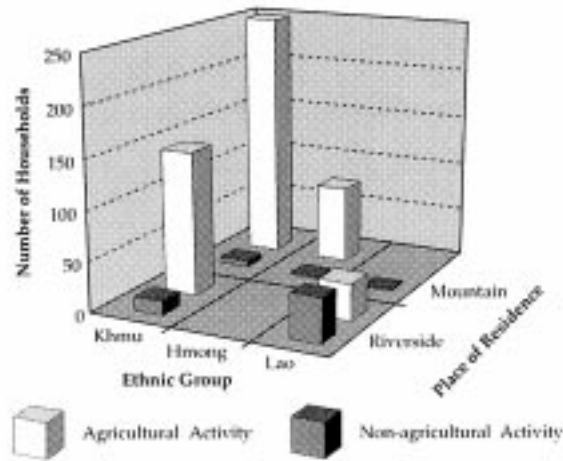
The Lao Standard Classification of Occupation in the 1995 census is classified into the following 3 items: major groups in 9 items, intermediate groups in 27 items and minor groups in 114 items [Lao P.D.R., National Statistical Centre 1997: 92–93]. Although this study used a classification corresponding to the intermediate groups of the 1995 census, only 7 items existed in the study area.

One of the reasons for the lack of occupation variety is that all settlements in the mountainous area perform communal activities, in order to live successfully. People in the mountainous area have learned specific techniques and skills for living daily life, which are dependent upon self-sufficient agriculture. For example, people make knives and farming tools, using a public workshop with the bellows. Moreover, constructing or repairing a house is collaborative work performed by resident. This type of technical skill would not be economically feasible as a form of vocational work in the mountainous area, unless people worked communally. People engaged in technically-skilled jobs live only at Hatsa and Pak Luang villages, which are located on the Ou riverside. Differences in living environment are reflected by differences in occupation structure.

Let us consider the relationship between settlement location, ethnicity, and economic activities (Fig. 2). As for settlement location, the differences in the three ethnic groups are clearly shown. The Khmu, the most populous group in the study area, reside throughout the whole region, from the mountainous area to the Ou riverside. On the other hand, the Hmong reside only in the mountainous area, while most ethnic Lao reside in the Ou riverside. Ethnic Lao households residing in the mountainous area are limited to the household of the teacher dispatched from the Ngoi district office.

Regarding the relation between economic activities and ethnicity, most Khmu and Hmong chiefly engage in agricultural activities, but ethnic Lao engage in both agricultural activity and non-agricultural activity. Many Khmu are farmers, despite residing along the riverside. So, it can be seen that the characteristics of Khmu economic activity contrast strongly with that of ethnic Lao, who have introduced many non-agricultural activities in the riverside areas. In addition to this, ethnic Lao living along the riverside can be strongly contrasted with Hmong living in the mountainous area.

4 ) The agricultural activities described here were limited to the cultivation of farm products. Livestock raising should be included in agricultural activity, however, there are the households which breed numerous pigs for sales purposes, while there are other households which raise only a few chickens for self-support. It is difficult to grasp the livestock raising situation with accuracy.



**Fig. 2** Interrelationship between Ethnic Group, Place of Residence and Economic Activities in Studied Settlements, 2001  
Source: Field survey by the author

### III Agricultural Activities and NTFP Gathering in the Northern Mountainous Area

#### III-1 Characteristics of Agricultural Activities

The agricultural fields in the study area can be roughly classified into swidden fields and small-scale reclaimed fields. Swidden fields are divided into two types: swidden fields for upland rice and swidden fields for corn. In small-scale reclaimed fields, the opium poppy is cultivated. There are no paddy fields in the study area.

The swidden system of the study area has only a single-year cultivation period and a 7 to 11 year fallow period. Each swidden field of upland rice and corn is prepared separately, but the swidden fields for corn are smaller than rice fields. In the swidden fields for upland rice, yam (*man-pao*, *man-oon*), taro (*man-puack*), cassava (*man-ton*), sweet potato (*man-dang*), chili (*mak-pet*), cucumber (*mak-teng*), melon (*mak-ten-rai*), gourd (*mak-bouap*, *mak-tao*), pulse species (*mak-thoua*), eggplant (*mak-khua*), job's tear (*mak-douay*), tobacco (*ya-suup*) and sesame (*mak-nga*) are grown, along with upland rice.

Mixed cropping featuring upland rice and other crops is performed in a disorderly fashion. However, tubers and vegetables tend to be planted intensively in the valley, whose soils contain a high degree of moisture. Cassava, sometimes used in new fields, may be planted separately in a swidden field for rice and corn. Swidden fields for cassava have a long cultivation and also a long fallow system with multi-year cultivation periods and a several-decades long fallow period.

The cash crop in the swidden fields is sesame only. Job's tear is being cultivated as a

cash crop in the northern mountainous region [Ochiai 2002]. People in the study area, however, have not cultivated job's tear as a cash crop since 1999. The reason for the discontinuance is that agro-forestry products brokers stopped purchasing it, as the selling price became too low to cover transportation costs. The price of job's tear is nearly that of rice. As rice is the staple food, farmers think that planting rice is preferable to planting job's tear. At present, job's tear is only cultivated on a small-scale for self-consumption.

All ethnic groups practice mixed cropping in swidden fields, and the crop types differ according to ethnic group (Table 2). Ethnic Lao and Khmu mainly cultivate sticky upland rice in their swidden fields, while the Hmong cultivate ordinary upland rice. All ethnic groups practice mixed cropping in swidden fields. The ethnic Lao plant less sesame, tubers, and vegetables than the Khmu or the Hmong. The Khmu plant all kinds of crops and also have larger amounts of cultivation than other groups. In the case of the Hmong, mixed cropping of tubers and vegetables is found, but less sesame is planted in their upland rice swidden fields.

There are also differences in the corn species planted, among the ethnic groups. There are two kinds of corn in the study area; animal feed corn (*sali-keang*) and food sweet corn (*sali-waan*). The Hmong grow a lot of feed corn while the ethnic Lao and Khmu grow both feed corn and sweet corn in almost the same proportion. The Hmong in the study area mainly give feed corn to pigs, while the ethnic Lao and the Khmu give a variety of food, such as mixed chaff and cereals to pigs. The differences in pig feed are related to the differing ratios of planted species of corn.

The opium poppy, cultivated in small-scale reclaimed fields, is only grown in Hmong settlements. A valley or area of sloping ground and good drainage is usually chosen for an opium poppy field. Regarding the soil condition of these fields, people say that "cold soil mixed with rocks (*din yien mii hin*)" is good. Since the sedimentary rock around the study area is limestone, the area conforms to the selection criteria of opium poppy fields used by Hmong villages in northern Thailand, where farmers favor limestone hollows with high pH [Keen 1978: 214]. After gathering raw opium, it is usually cooked to remove moisture and impurities. Most of the cooked opium is sold to brokers; however, it may also be consumed for private use, if an opium smoker is in a household.

It can be seen that the variety and proportion of crops produced in swidden fields differs according to ethnic group. Cash crops are limited to sesame and the opium poppy, while

**Table 2** Mixed Cropping in Swidden Fields in the Study Area

Ethnic Group	Swidden Field for Upland-rice					Swidden Field for Corn	
	Upland-rice		Mixed Cropping with Upland-rice			Sweet Corn ( <i>sali-waan</i> )	Feed Corn ( <i>sali-keang</i> )
	Sticky Rice	Ordinary Rice	Cash Crop	Tubers	Vegetables		
Lao	Many	Little	Little	Little	Little	Little	Little
Khmu	Many	Little	Moderate	Moderate	Moderate	Moderate	Little
Hmong	Little	Many	Little	Moderate	Moderate	Little	Moderate

Source: Field survey by the author



other crops, including rice, are grown for the purpose of self-support. Although rice can naturally be sold as cash crop, the farm households which were able to obtain surplus rice came to only 18 out of 136 households in 2001. Agriculture is a crucial subsistence activity, however it does not always contribute to cash income.

In this environment, the gathering of NTFPs is vigorously carried out, as well as crop cultivation, in order to obtain cash income. NTFPs are usually gathered by villagers on the way to and from the swidden field. Moreover, the existence of ethnic Lao brokers in the study area is one of the major factors causing a sharp increase in NTFP gathering.

### III-2 Characteristics of Gathered NTFPs

There are vast numbers of NTFPs, such as resin, bark, fruits and so on, as well as insects and animals [de Beer and McDermott 1996: 29–44]. In this paper, only NTFPs with an economic value and which are continuously gathered have been taken into consideration. Seven kinds of NTFPs produce cash income in the study area: cardamom, benzoin, *puack muack*, paper mulberry, rattan fruits, galangal fruits, and tiger grass (Table 3, Photo 1). In addition to these NTFPs, Soydara and Khetphanh [2001] have reported that bamboo shoots known as *no kom* also contribute to the cash income in northern Laos. People in the study area also gather *no kom* for food, from December to February. The selling price of *no kom* at the periodic markets, which occur on the river once every 10 days, is only 1,000kip (about US\$0.10) for about 10 bunches. Therefore, *no kom* is not mentioned here, as it does not provide cash income.

**Table 3** Characteristics of NTFP with Economic Value in the Study Area

Local Lao	Name		Type	Product	Crop Season	Local Purchase Price in 2001 (kip/kg)	Use
	English	Scientific					
<i>mak neng</i>	Cardamom	<i>Amomum villosum</i>	Perennial plant	Fruits	Aug.–Sep.	15,000	Medicine
<i>nhan</i>	Benzoin	<i>Styrax tonkinensis</i>	Tree	Gum	Apr.–May	45,000	Flavor and fragrance industries, medicine
<i>puack muack</i> ( <i>sapan, nan nyao</i> )	(None)	<i>Boehmeria</i> sp. *	Perennial plant	Bark	Year-round	2,000	Incense stick, glue
<i>po sa</i>	Paper mulberry	<i>Broussonetia papyrifera</i>	Tree	Bark	Year-round	2,000	Paper
<i>mak wai</i>	Rattan fruits	<i>Daemonorops</i> sp. *	Tree	Fruits	Aug.–Sep.	4,000	Medicine
<i>mak kha</i>	Galangal fruits	<i>Alpinia galanga</i>	Perennial plant	Fruits	Jul.–Sep.	4,000	Medicine
<i>khem</i>	Tiger grass	<i>Thysanolaena latifolia</i>	Perennial plant	Thin panicle	Mar.–Apr.	2,500	Broom

Source: Field survey by the author

\*The author cannot identify the species of this plant at the moment.



(a) Cardamom (*Amomum villosum*)



(b) Benzoin Resin from *Styrax tonkinensis*



(c) *puack muack* (*Boehmeria* sp.)



(d) Paper Mulberry (*Broussonetia papyrifera*)



(e) Rattan Fruits (*Daemonorops* sp.)



(f) Galangal Fruits (*Alpinia galanga*)



(g) Tiger Grass (*Thysanolaena latifolia*)

**Photo 1** NTFP in the Study Area

The NTFPs listed in Table 3 are unused by the local residents. The gathering of benzoin and cardamom, however, has had a long history in Laos. These NTFPs have been gathered since the Lân Xāng Kingdom era of the fourteenth century [Stuart-Fox 1998: 49]. In the study area, NTFPs had been gathered over the past 80 years, according to interviews with the older village men. Other NTFPs were begun to be gathered in compliance with the demands of brokers outside the study area, following the opening of borders with China and Thailand in the late 1980s.

The following five kinds of NTFPs: cardamom, paper mulberry, rattan fruits, galangal fruits and tiger grass, can be gathered everywhere in the mountainous region of Laos. However, *puack muack* can only be gathered in the northern region. Benzoin is special kind of NTFP because it can be gathered only in the limited environment of northern Laos.

*Cardamom (Amomum villosum)*

Cardamom is sometimes cultivated in Laos. Since people in the study area gather wild cardamom, this paper has categorized it as an NTFP. The fruits are gathered between August and September and used as a stomachic or a spice. As domestic demand is low, almost all cardamom is exported to Thailand and Korea.

*Benzoin (Resin from Styrax tonkinensis)*

Benzoin is a balsamic resin obtained from the genus *Styrax*. The resin obtained from *Styrax tonkinensis* in the study area is called “Siam benzoin” in the world market. This is regarded as a high-class commodity compared with Sumatra benzoin, derived from *Styrax benzoin* or *Styrax paralleloneurum* distributed around northern Sumatra and the Malay Peninsula [Konoshima and Nagai 1969: 40]. The method of resin tapping is primitive. The tapper notches the cambium of tree in October. The resin exuded from incision is left until it has dried out, and then it is gathered from March to May. Benzoin has various purposes; it is used for instance in pharmaceuticals, fragrances and flavors [Coppen 1997: 7–11]. Siam benzoin is produced almost solely in Laos at present, and is gathered only in the mountainous regions of northern Luang Phabang province, Phongsaly province, and Houaphanh province, respectively.

*Puack Muack (Boehmeria sp.)*

*Puack muack* is a perennial plant of the genus *Boehmeria* in the Urticaceae family, according to Xaydala and Lamxay [2000: 18–19]. However, the author cannot identify the species of this plant at the moment. It is used as the paste which hardens into an incense stick, or glue. It is sometimes called “*sapan*” or “*nan nyao*” in Laos. *Puack muack* is dried in the sun after gathering. All *puack muack* is exported to China.

*Paper Mulberry (Broussonetia papyrifera)*

Paper mulberry is the deciduous tree of the genus *Broussonetia* in the Moraceae family. The

bark of paper mulberry is used as a material for the traditional handmade paper called *sa* paper. The bark is removed from the tree, and the epidermis is peeled from bark. Part of the paper mulberry is used in paper-making for tourists at Luang Phabang, but most is exported to Thailand.

*Rattan Fruits (Daemonorops sp.)*

The rattan discussed in this paper might be of the genus *Daemonorops* in the Palmae family. The author, however, cannot identify the species of this plant at the moment—there are many rattan species in Laos. People gather fruits and stems, but brokers purchase only fruits. The rattan fruits are exported to China as ingredients for traditional medicine. The rattan stems are used as food, and these are sometimes sold at periodic markets.

*Galangal Fruits (Alpinia galanga)*

Galangal, genus *Zingiberaceae*, is a native of mountainous areas in Southeast Asia. Especially in Thailand and Laos, its rootstock is commonly used for making distinctive acidulous soups, such as *tom yam*. Local people, however, gather not the rootstock but the fruits, according to demand from China. Galangal fruits are used in Chinese traditional medicine for indigestion, stomachache, diarrhea and vomiting [Jiangsu Xin Yi Xue Yuan 1979; Takido 2001].

*Tiger Grass (Thysanolaena latifolia)*

Tiger grass is a perennial plant of the Poaceae family. A part of the thin panicle is used for making brooms, so tiger grass is also called “Broom Grass.” The thin stems with small seeds are first sun-dried after gathering from March to April, and then the tiger grass is manually threshed to remove the seeds. The seeds are sometimes used for food by the local people. All tiger grass is exported to Thailand.

III-3 *NTFP Gathering and Forest Vegetation*

NTFPs are closely connected to forest vegetation, thus the relationship between forest type and gathering sites of NTFPs should be considered. The Cheang Kang settlement, located 830 meters above sea level, is used as an example (Fig. 3). The settlement surroundings are enclosed by four types of forest: protection forest, fallowed swidden of one year of age, fallowed swidden of three years of age, and fallowed swidden of six years of age.

In fallowed swidden at one year of age, styrax trees and tiger grass grow to about 2 meters and 1.5 meters in height respectively. In this type of forest, only tiger grass is gathered.

In the fallowed swidden of three years of age on the north side of the settlement, styrax trees reach about 4–5 meters in height, and the tree species are more various than those found in fallowed swidden of one year of age. Tiger grass is still gathered in this older fallowed swidden, but the quantity is smaller than that found in fallowed swidden of one year of

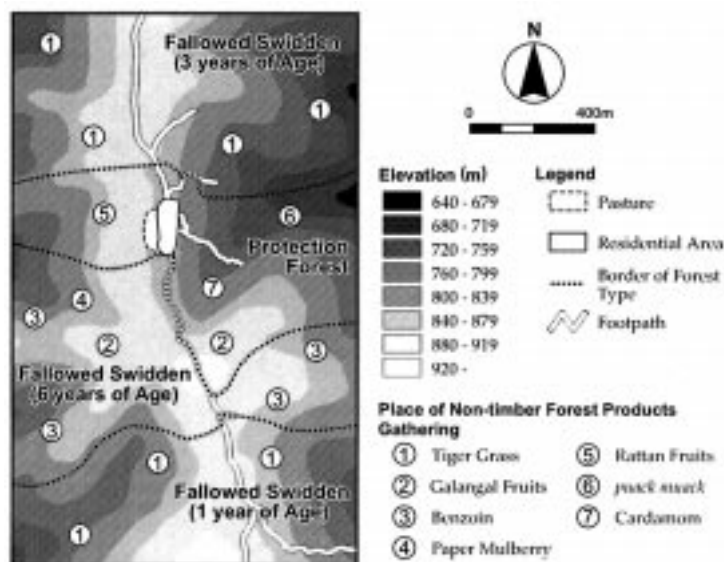


Fig. 3 Forest Types and NTFP Gathering Places in Cheang Kang Settlement, 2001

Source: Field survey by the author using GPS

age. Although some villages in the study area gather paper mulberry from fallowed swidden of three years of age, this was not seen in the highland fallowed swidden around Cheang Kang settlement.

In the fallowed swidden of six years of age located to the south of the settlement, styrax trees grow to about 10 meters. It is possible to gather benzoin there. In the moist environment, people gather the bark of the paper mulberry, which reaches about 10 meters in height, and the fruits of galangal grown on the lower levels of the tree. In fallowed swidden of more than three years of age, tiger grass can hardly be found, and trees such as the styrax tree are grown instead.

In the protection forest, styrax trees have not yet been found. The styrax tree grows fast, but will die when taller tree species surround it, as it is an intolerant species. Multi-layered vegetation is formed in the protection forest, comprising bushes and tall trees. Styrax tree height reaches about 10 meters, and people gather the fruits of the rattan and the galangal on the ground. Cardamom and *puack muack* can be gathered as well. According to the local people, although cardamom sprouts 2–3 years after burning the trees for swidden agriculture, an additional period of three years or more is required before fruits can be gathered. Thus, a total of 5–6 years is needed in order to gather cardamom. However, cardamom was not grown in fallowed swidden of six years of age when this survey was carried out in Cheang Kang settlement. In addition, although residents said that *puack muack* is found in fallowed swidden of over 2–3 years of age, it is usually gathered not in fallowed swidden but

in protection forest with a humid environment.

The gathering rights of NTFP can be divided into private access rights and communal access rights. Private access rights are applied to benzoin and tiger grass. These NTFPs are grown as secondary vegetation along with swidden agriculture. The rights of the use of swidden field plots allotted to each household continue to apply to fallowed swidden. The allottee can gather these NTFPs only within his allotted fallowed swidden. The private access rights have been accepted by the villagers of the study area and regarded as fair, as swidden field areas are distributed according to household size.

By contrast, communal access rights are applied to other NTFPs; cardamom, *puack muack*, paper mulberry, rattan fruits, and galangal fruits; these can be gathered anywhere. The settlements in the study area have decided upon the commencement date for gathering NTFPs. This regulation has only limited application to cardamom. Setting the commencement date of forest-product gathering is the role of the village or the settlement administration committee. The date of commencement refers only to typical known and habitually used for gathering. There are no regulations for gathering at places where few cardamoms grow. The regulations are imposed upon villagers for ensuring equal access to all common forests. In case of the Cheang Tai settlement, the settlement administration committee set the commencement date of NTFP gathering for galangal fruits and rattan fruits in addition to cardamom, so as not to give the villagers cause for complaint due to unfairness.

There are a variety of gathering methods used for NTFP, which differ according to the environment, taking into account factors such as the period of fallowed swidden and humidity. Fallowed swidden is not only fallowed for the next cultivation but also used as a place where people gather NTFPs.

#### **IV Spatial Structure of the Forest Use in the Northern Mountainous Area**

##### *IV-1 Interrelationship between NTFP Gathering, Settlement Location and Ethnicity*

In the preceding chapter, the interrelationship between NTFP gathering and forest vegetation was explained by giving an example of a Khmu settlement (the Cheang Kang settlement, see III-3). The result can be mostly applied to ethnic Lao and Hmong settlements, but some differences among ethnic groups and settlement locations according to altitude must be considered. In order to discuss these differences, this section analyzes the interrelationship between income from NTFP, settlement location and ethnic group by looking at households and their gathering activity of NTFPs (Fig.4). The settlement locations are divided into five zones by altitude: the Ou riverside, middle-lowland, middleland, middle-highland and highland.

Average household incomes from NTFPs for ethnic Lao, Khmu, and Hmong were 251,645 kip (about US\$26.50), 1,276,910 kip (about US\$134.40) and 595,452 kip (about US

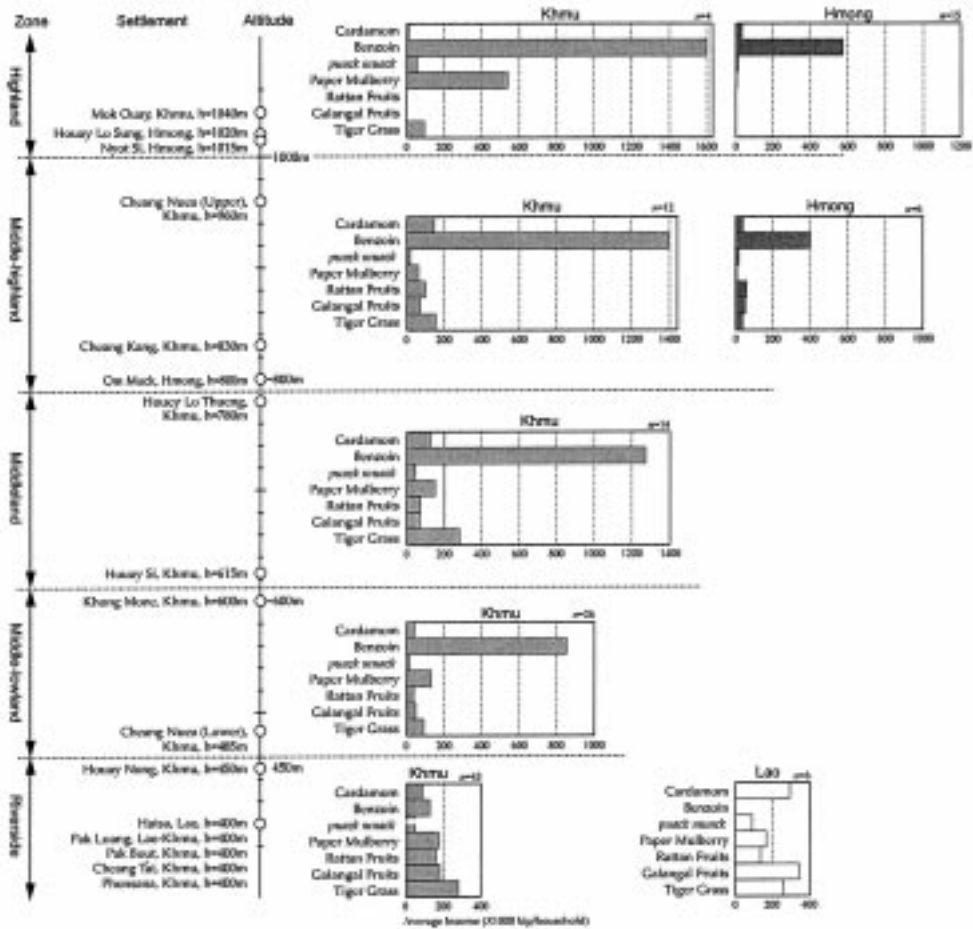


Fig. 4 Average Income of NTFP by Altitudinal Zone, 2001

Source: Field survey by the author

\$62.70), respectively. Income from NTFPs obtained by the Khmu is larger than that of other groups. The ethnic Lao engaged in NTFP gathering are found in only 6 households in Pak Luang village, approximately 7.5 percent of surveyed ethnic Lao households. There are no household-gathered NTFPs in the Hatsa village, yet 26 ethnic Lao households practice swidden agriculture. On the other hand, about 91 percent of Khmu households and all Hmong households gather NTFPs.

Income from benzoin clearly increases in proportion to the altitude. Rattan fruits and galangal fruits are actively gathered in the riverside settlements, but these are not gathered at the highest-altitude zone. The gathering of other NTFPs: cardamom, *puack muack*, paper mulberry and tiger grass, does not show variance by altitude. As paper mulberry generally does not grow at a high altitude, consequently people living in the middle-highland descend

to the lowland for gathering.

Benzoin is the most profitable NTFP in the study area. The Khmu income from benzoin is larger than that of the Hmong settlements residing at the same altitude. The ethnic Lao do not gather benzoin; however, the amount of NTFP gathering of the ethnic Lao is not much lower than that of the Khmu living at the same altitude zone. NTFP gathering of the Hmong is specialized to benzoin; they are not much interested in other NTFPs. There are only four households which gather low unit-cost NTFPs such as paper mulberry bark and *puack muack*.

The reason why the Hmong are not active NTFP gatherers is that they apparently put a lot of effort into opium poppy cultivation. The Hmong emigrated from Sichuan and Yunnan in China to the Luang Phabang area around 1847–50 to find new forest land for cultivating opium poppies [Culas 2000: 36]. From this fact, it can be determined that the Hmong put a major emphasis on opium poppy cultivation. Additionally, as Hmong history in Laos is brief, they may not be as conversant with the forests of Laos compared with the Khmu. The Hmong consider NTFPs gathering a kind of side business. According to the results of the household-level survey of opium cultivation among Hmong settlements, the average household income from opium in Nyot Si village, Om Mok village and Houay Lo Sung settlement came to approximately 450,000 kip (US\$47.30), 875,000 kip (US\$92.10) and 1,400,000 kip (US\$147.40) respectively. The amount of income from opium might be satisfactory to them, therefore they may not need to actively gather NTFPs.

In terms of the NTFP gathering of the Khmu and ethnic Lao, Stuart-Fox [1998: 49] describes NTFP gathering in the Lān Xāng Kingdom era of the fourteenth century: “Valuable forest products such as benzoin and other resins, sticklac for making lacquerware, cardamom and beeswax were collected mainly by Lao Thoeng. . . . Tai-Lao middlemen (Known as *lām*) developed traditional relationships with Lao Thoeng villages, paddling their canoes upstream once or twice a year to exchange cotton cloth, iron, and silver for forest products which they towed downstream on bamboo rafts.” The terms Lao Thoeng and Tai-Lao must represent the Khmu and ethnic Lao, respectively. Concerning the word *lām* in the preceding quoted sentence, Halpern [1958: 69, 74] also pointed out, “The *lām* is a person who acts as an intermediary between traders and occasionally the government on the one hand, and the tribal people, usually the Khmu and the Meo (the Hmong), on the other. The *lām* himself is a Lao (an ethnic Lao), most often inhabiting a village that has relatively easy access to markets. . . . Traditionally the Khmu came to him whenever they had some forest products to sell or wanted to buy salt or clothing. Then the *lām* would arrange the trade with a merchant, or sometimes the *lām* himself engaged in commerce directly with the tribal peoples.”

So it can be seen that an ethnic Lao broker, known as *lām*, played an important role in NTFP trading with the Khmu until the 1950s, despite the fact that there is no *lām* in the study area at present. The Khmu have actively gathered NTFPs since very early times, and the ethnic Lao have long been in a broker-like role in the community. Thus, it can be expected that the ethnic Lao did not gather NTFPs in mountainous areas, such as the study



area. It is likely that the ethnic Lao once living in the lowlands settled in the mountainous areas in order to trade with the Khmu and started farming, on the side. As well, some of them imitated NTFP gathering of the Khmu. Concerning the characteristics of the ethnic Lao, as Hayashi [1998: 91] has pointed out, they have historically accomplished the improvement of their lives by practicing half-farmer and half-trader styles of economy, seeking unplowed land and negotiating with the indigenous inhabitants. In the study area, ethnic Lao farmers practice both swidden agriculture and non-agricultural activities, such as agro-forestry products brokerage and/or general store management. The half-farmer and half-trader style was exactly what was found in the study area as well. The occupation structure of the ethnic Lao is obviously different from that of the Khmu and Hmong, who specialize in agriculture and hunting-gathering occupations.

#### IV-2 *Forest Use Model in the Northern Mountainous Area*

The reason that the ethnic Lao do not gather benzoin is that they do not have swidden fields in the highlands, in spite of their practicing swidden agriculture. Benzoin resin cannot be tapped in the lowlands—this is due to a biological peculiarity of the styrax tree. Regarding the relationship between altitude and benzoin gathering, as Takeda [2001: 9] pointed out, the people of Kachet village (Nam Bak district, Luang Phabang province), who are located at an altitude of about 750 meters, gather benzoin from large trees aged over six years. In terms of the relationship of benzoin gathering to the diameter of the trunk of the styrax tree, Sroithongkham [2001] measured trunk diameter from 1997 to 1998 at the same village which Takeda studied, and found that a tree with less than 13 DBH (diameter at breast height) centimeters was unsuitable for tapping.<sup>5)</sup> Pinyopusarerk [1994: 12] also provides additional details concerning differences in quantities of benzoin resin among tree types: “More resin is obtained from trees having dark brown, thick bark with deep fissures and obvious parenchyma cells.” According to the survey by this author at Pak Bout settlement, it was found that fallowed swidden at an altitude of about 600 meters can provide benzoin from trees aged of 6–7 years; however, styrax trees located at an altitude of about 400 meters near the Ou River remain sapless even after many years. It seems that natural environmental properties, such as altitude, temperature, and humidity, have a physiologic effect on the styrax tree in terms of its resin production.

The forest use model shown in Fig. 5 was produced based upon interviews with villagers and forest observation. In the model, forest vegetation is divided into 10 groups according to typical forest use, altitude, and moisture.

Forest Use I (Fig. 5, protection forest) presents a forest physiognomy in which dried *Dipterocarpus* trees, cardamom, rattan fruits and galangal fruits are gathered. In Forest Use

5 ) Trees which did not provide full quantities of resin even over 13 DBH centimeters existed. The research location for these and the study area of this paper adjoin, and the natural environment is almost the same.

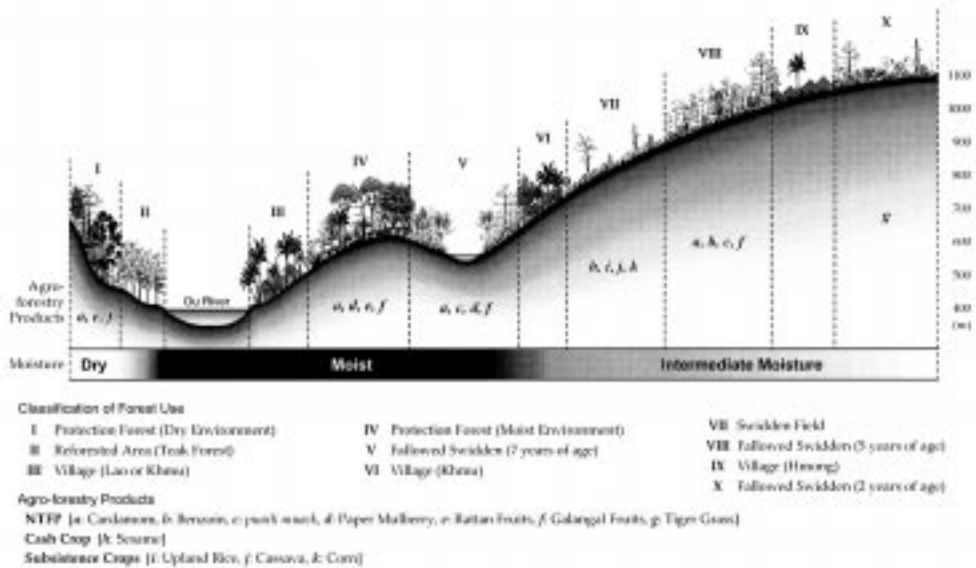


Fig. 5 Generalized Model of Forest Use in the Mountainous Area of Northern Laos

II along the Ou riverside, teak trees are reforested. The reforested land is private forest afforested by either ethnic Lao or Khmu people living in Forest Use III (ethnic Lao or Khmu village areas). Forest Use IV is protection forest which exhibits a physiognomy of mixed dipterocarp. The protection forest has reached its maximum growth, but much of it is secondary forest. In addition to cardamom, rattan fruits, and galangal fruits, which are gathered in the protection forest of Forest Use I, paper mulberry is also gathered. Paper mulberry also grows naturally in both swidden field and fallowed swidden in moist environments and at low land, especially near springs and streams in the case of the study area. Paper mulberry can be gathered from fallowed swidden of two years of age because of fast growing trees, if the proper growing conditions are met [Fahrney *et al.* 1997: 6]. Rattan fruits generally grow in a protection forest of mixed dipterocarp, and these can be sometimes found in the long-period fallowed swidden for five years or more.

Styrax trees providing benzoin grow in fallowed swidden of 7 years of age (Forest Use V). They sprout naturally after tree burning, and then take over as the dominant species until they are about 15 years of age. However, benzoin can hardly be tapped there because the altitude of Forest Use V is too low. Therefore, NTFPs gathered there are cardamom, *puack muack*, paper mulberry and galangal fruits.

Khmu settlements are located in the middle-highlands (Forest Use VI). These are found particularly in the middle-highlands, though they are also more widely found from the Ou riverside up to the highlands. Sesame, cassava, and corn, in addition to upland rice, are planted in the swidden fields (Forest Use VII). Forest Use VIII is fallowed swidden of five years of age. Although the period of fallowed swidden is shorter than that of Forest Use V,

benzoin can be tapped due to the higher altitude. On the other hand, paper mulberry hardly grows here, owing to the absence of a humid environment. Hmong settlements are located in the highlands of Forest Use IX. In Forest Use X, tiger grass is gathered in fallowed swidden of two years of age.

People in the mountainous area of northern Laos know a great deal about how the environment provides NTFPs. Consequently, it is worthwhile to mention in detail the fallowed swidden—which clearly plays an important role for the gathering NTFPs. Seven kinds of NTFPs have been presented in this paper, six of which are gathered mainly in fallowed swidden (Table 4). At least one kind of NTFP can be gathered over a fallowed period. Swidden fields are usually shifted in 8–12 plots in the study area. As shown in Table 4, many varieties and a large quantity of NTFPs can be obtained from the fallowed swidden after six years of age.

The swidden system, in combination with benzoin gathering, is an example of systematic land use. A model diagram illustrating the relationship between benzoin gathering and a swidden system utilizing eight plots is shown in Fig. 6. In the reference year, one plot is active swidden, while the remaining seven are fallowed swidden. Benzoin cannot be gathered at an altitude of below 600 meters, so it is assumed that the reason for the lack of production is that the land is above this altitude. Since the benzoin resin cannot be gathered from the first to the third fallow year, the styrax tree is left as-is. In fact, people gather benzoin in fallowed swidden of 4–5 years of age. The number of fallow years after which it becomes possible to tap styrax trees differs depending upon altitude: trees can be tapped from 4–5 years in the highlands, and from 6 years at an altitude below 700 meters. Therefore, as Fig. 6 shows, benzoin is gathered every year from two places to a maximum of four places in the highlands, in the case of swidden cultivation involving eight fallows. In the experience of local residents, it is better to start gathering the resin as early as possible, because resin production declines after 11 years. As well, some trees produce for only one year, while others produce over a two-year stretch. It can be seen then that the period of gathering at one plot needs to be at least 2 years. Thus, people must practice swidden culti-

**Table 4** Relationship between Fallow Periods and NTFPs\*

NTFP	Fallow Period (Year)	1	2	3	4	5	6	7	8	9	10	11
	Cardamom											
Benzoin**												
<i>puack muack</i> ***												
Paper mulberry***												
Galangal seed												
Tiger grass												

Source: Field survey by the author

Quantity of NTFP gathering: Small , Moderate

\* Since the rattan seed was seldom found in the fallowed swidden, it is not listed in this table.

\*\* Depending on altitude.

\*\*\* Grown in the moist environment.

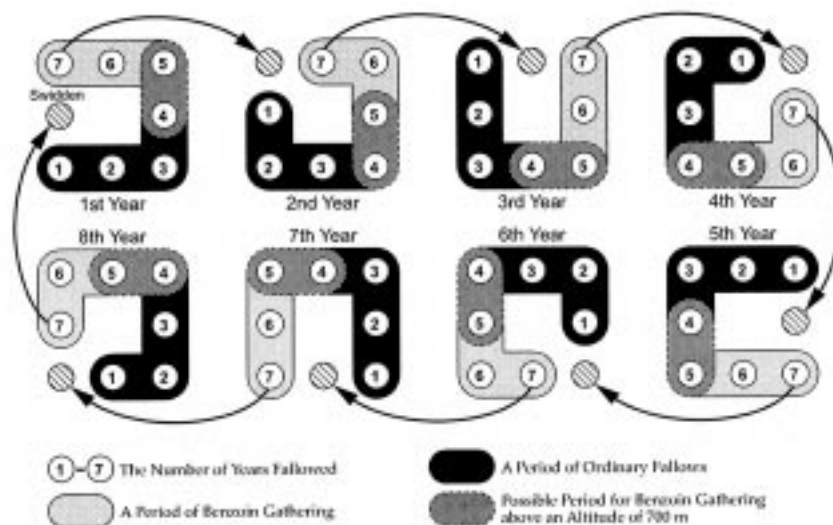


Fig. 6 Swidden System in Combination with Benzoin Gathering

vation involving at least eight fallow plots.

The number of fallowed swidden where benzoin can be tapped does not increase in cases where there are more than eight fallow plots. *Styrax* trees producing a large quantity of resin die quickly, and it is an intolerant species; thus, the forest must be artificially burnt at a constant frequency in order to gather benzoin. A reproduction of *styrax* trees is performed in combination with swidden agriculture. This land-use system of combined benzoin gathering and swidden agriculture is comparable to a concept of an agro-forestry which was described by Takeda [2001].

#### IV-3 Forest Use and Forest Policy

Benzoin production in Laos has a long history. According to a report on the mission to the Far East (1642–48), found in the first published book in Europe discussing the Lao Kingdom, de Marini [[1663] 1998: 5–6] explains, “The principal essence of [the Lao Kingdom] is a great abundance of benzoin which is considered the best in the Orient. . . . Because the king obtains great profits from it, it is prohibited to sell the fruit to foreigners.” The history of benzoin gathering in northern Laos is at least five hundred years old. Probably land use combined with fallowed swidden had already been practiced for many centuries. Such land use is regarded as an indigenous sustainable land use system.

An external impact to an indigenous sustainable land use system which has been built up over the centuries, however, would likely cause its ongoing stability to collapse. Such an impact might be caused by political regulations prohibiting or restricting types of forest utilization.

In Laos, the Land Law was promulgated in 1996, following which agricultural lands were

allocated to each family. The allottee was entitled to a Permanent Land Title (*Bai Ta Din*) from the Ministry of Finance. The title is able to be sold and purchased, but the land itself belongs to the state. According to Article 17 of the Land Law, a family<sup>6)</sup> is permitted the allocation of agricultural land under the following conditions: (1) up to 1 hectare for rice and fish farming; (2) up to 3 hectares for commercial crops; (3) up to 3 hectares for orchard; and (4) up to 15 hectares of deforested land or grass land for pasture. Under these conditions, it is simply impractical to practice swidden agriculture, as the allocated land which may be used for rice farming amounts to only 1 hectare.

The land-forest allocation program has been set forth in order to conserve bio-diversity in forest areas, and to encourage sedentary agriculture [Lao P.D.R., Lao Consultant Group 2002: 10–15]. A period of fallows have been shortened to five years or less due to population pressure, as has been recently reported [Roder 1997; Suzuki and Yasui 2002], but the study area maintains a fallow period for at least eight years since benzoin is an important cash income source. It can be mentioned that local residents maintain their accessibility to NTFPs in fallowed swidden through the maintenance of long fallow period. The land-forest allocation program has not yet progressed into the mountainous area. However, NTFPs obtained from fallowed swidden may no longer be able to be gathered, if the program is implemented there.

Fundamentally, the forests of Laos are under government control, and the land-forest allocation program is proceeding under the guidance of international organizations and overseas development assistance groups, such as NGOs and official development agencies. The forest resources of Laos are increasingly gaining international attention, and the government is now attempting to enforce a forest conservation policy from a macroscopic standpoint. Therefore, the current land-forest allocation program may have negative consequences if local people cannot gather NTFPs—even if the government does not intend to deprive of livelihood of local people as a consequence. Overall environmental circumstances relating to the indigenous knowledge of the people in the mountainous area reveal the fragile nature of an economic activity that depends heavily on forest resources. Thus, it is necessary to discuss the relationship between policy implementation at the state level, and natural resource use at the local level.

## V Conclusion

In this study, traditional forest use was analyzed from a spatial point of view, with a focus on NTFP gathering performed by three ethnic groups, ethnic Lao, Khmu and Hmong, who live in rural areas without road access, in northern Laos. The results can be summarized as follows:

6 ) Formally, the expression “per full-time family labor unit” is used.

Many ethnic Lao are engaged in non-agricultural activities, and approximately half of their households do not have any agricultural practices. As their settlements are located along the river, many ethnic Lao households engage in agro-forestry products brokerage and/or general store management. Khmu settlements are located throughout the whole region, from the mountainous area to the Ou riverside, with agriculture as the main activity of most households. They are also very active in NTFP gathering, especially in benzoin gathering. Hmong settlements are located only in mountainous areas; most of these households have both rice farming and opium poppy cultivation as their important activity.

The difference in NTFP gathering activity is related to the characteristics of occupation structure on the part of each ethnic group. The ethnic Lao, who have historically been half-farmers and half-traders, are not active in NTFP gathering. The Khmu, in the mountainous areas, have earned cash income from NTFP gathering for long time, and are very active in NTFP gathering. In the case of the Hmong, it was found that an emphasis is placed on cultivating the opium poppy in addition to NTFP gathering.

A large quantity of NTFPs is grown as secondary vegetation after burning the forest for swidden agriculture. The most notable of these is the styrax tree. In order to tap benzoin from this tree, a long fallow swidden agriculture system with at least eight plots must be maintained. Agro-forestry, such as forest use, cultivating rice in the swidden field and gathering NTFPs from fallowed swidden, has long been practiced in the study area. The forest in Laos is used by people of the mountainous area both historically and substantially, but officially managed by the government. This agro-forestry mode of forest use, or indigenous sustainable forest use system, therefore, is at risk of collapse due to political regulations concerning forest utilization; particularly in the case of the land-forest allocation program.

Regional or national forest policy should not offer a compromise solution between a locally microscopic viewpoint and a globally macroscopic viewpoint, but rather, respect local knowledge. The government should apply an area-based forest policy, after clarifying the historical background of natural resource use, rather than applying a country-wide standardized policy. It is hoped that some of the ideas presented in this study may be used as fundamental data for such forest policy planning.

On the basis of the study results, clarification of the comprehensive regional eco-history, namely historical change due to ethnic immigration, natural resource use and occupation structure, is required in order to further pursue the relationship between ethnicity and forest use. At the same time, the viewpoint of "political ecology" may be effective in thinking about the relationship between forest policy and indigenous sustainable forest use systems.

Regarding political ecological analysis, Berkes [1999: 165] presented an interpretation of the complexity of traditional knowledge issues as follows: (1) there exist different actors who relate in different ways to the resource in question; (2) The actors define knowledge, ecological relations, and resources in different ways and at different levels or geographic scales; (3) They bring to bear on these definitions their culture and their experience; and (4) They will use different definitions in pursuit of their own "projects" or political agendas. This

perspective of political ecology seems relevant and helpful in studying the relationship between the government and local people. Such studies need to be commenced in the near future, as much work remains to be done.

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