The Livelihood System of the Population of a Mountainous Area in Northern Laos

A Case Study of Ngoi District, Luang Phabang Province


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I Introduction

In Laos, 80 percent of the population is composed of many ethnic minorities varying in language and culture, living in the mountainous area that occupies 70 percent of the nation’s land area. In 1986, after 11 years of communist-based policies, the government adopted the Lao version of Perestroika or ‘Chintanakanmai’. Those policies appear to be having an impact even in remote areas. At present, the mountainous area is staring to be involved in the wave of development.

The government and international organizations are carrying out a variety of rural development programs\(^1\) such as the promotion of market-oriented crops, development of paddy and irrigation system construction. In addition, resettlement programs\(^2\) for producing new jobs and improving living standards are also being implemented in remote areas. These programs’ purpose often focuses on the stabilization of swidden agriculture.

The question then arises as to the thoughts of people in mountainous areas. They may have a strong will to keep their traditional life style. On the other hand, it is clear that the government side is being torn between environmental conservation and development. Laos, both the people and the government, is groping for the future of the remote areas.

This report presents the results of a case study of a mountainous area in Ngoi district, Luang Phabang. The focus of the report is on clarifying the basis for existence of the population in a mountainous area generally inaccessible by main road, by discussing the relationship between economic activities, natural environment, ethnicity, society and culture.


II Economic activities

II-1 General information and history of the study area

The study area was selected according to the following criteria: (1) no road access, (2) unbiased ethnic distribution according to provincial ethnic statistics, and (3) swidden agriculture forms the core of economic activities. Consequently, the report picked northern Ngoi district in Luang Phabang province as the study area (Fig. 1).

The minimum altitude in the study area is that of the Nam Ou riverside, which is around 400 m above sea level. The highest peak is Mt. Pha Onng, which is located in the southwest of the study area, some 1,267 m above sea level. The study area features a mountainous landscape. There were 15 villages and 25 settlements, as of the end of 2001. Until the middle of the 1990s, the study area had 23 villages and 24 settlements. There were two causes of the change in the number of villages and settlements. The first is that 18 small villages were merged into 15 villages by the district office, following a government decree. The second cause for it is that one village was divided into two settlements.

Village mergers are implemented with ethnic purity in mind in order to avoid creating dissension amongst ethnic groups. However, it raises new questions, in that communication between settlements is bad. It is difficult for merged villages to administer a village because of the great distance separating it components. For example, Mok Ouay was merged into Phonsana in 2000, but it takes 2 hours to walk between the two settlements. In another case, Cheang Tai was relocated from a mountainous site to the Nam Ou riverside in 1998, and then the settlement was merged into Pak Bout located on the opposite bank in 1999. There is no path to go between Pak Bout and Cheang Tai, so that they must use a boat.

Although an administrative unit is the same, a living unit is different; moreover, comings and goings between settlements are not so common. Hence, this report uses “settlement” as a unit for analyzing socio-economic activities in order to reflect the actual situation.

3 The decree states: “Any area comprising less than 20 households are placed under a neighboring village” in Article 2. Prime Minister’s Office (1993). Degree on the organization and administration of villages (No. 102/PM), Vientiane.
## Village Classification

- **Merged Village**
- **Surveyed Settlement**
  - Lao
  - Lao-Khmu
  - Khmu
  - Hmong
- **Non-surveyed Settlement**
  - Lao-Khmu
  - Khmu
  - Hmong
  - Unknown (Outside the Study Area)

### Elevation (m)

- 0 - 499
- 500 - 599
- 600 - 699
- 700 - 799
- 800 - 899
- 900 - 999
- 1000 - 1099
- 1100 - 1199
- 1200 -

### Source:

Made DEM from Service Geographique D'etat 1983 (B.Ngoi-Nua and Khoa 1/100,000 topographical maps) and 1999 (aerial photographs) by GIS, and surveyed by author.

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**Fig. 1  Study Area, 2001**

Source: Made DEM from Service Geographique D'etat 1983 (B.Ngoi-Nua and Khoa 1/100,000 topographical maps) and 1999 (aerial photographs) by GIS, and surveyed by author.
Profiles of studied villages are shown in Table 1. 15 settlements were surveyed out of 24 settlements in the study area, and four types of ethnic group were surveyed: Khmu, Hmong, Lao, and Lao/Khmu (Photo 1 and Photo 2). The number of households is 516 in total, and the ethnic structure ratio of Khmu, Lao, and Hmong is 69.8 percent, 15.5 percent, and 14.7 percent respectively.

In general, it can be said that the ethnic Lao are Buddhist, and that the Khmu and Hmong are Animist. However, three Khmu settlements located in the northwest of the Nam Ou (Pak Bout, Houay Lo Toung and Khong Mone) are of Buddhism faith, too. In these Khmu settlements, various events following the Buddhist calendar of the ethnic Lao are held, in addition to traditional Animistic rites. Both Buddhist Khmu and Animist Khmu use their own calendar that consists of 10 days as one unit.

The history of settlement in the study area is divided into two categories. Cheang Nuea Upper, Cheang Kang Upper, Mok Ouay, Hatsa and Pak Luang have a history of over 150 years, but the others have a history of less than 30 years. All new settlements have experienced relocation within the same district or were created by branching off from a mother village. For example, Phonsana was built in 1981 to accommodate 30 households relocating from Samnun, near the Vietnamese border. Relocating from a mountainous site to the riverside was a long-cherished desire for the relocated households. The place where the village was built was vacant land, the former location

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4 Om Mok and Nyot Si, Hmong settlements, contain only one Lao household each. In both cases, they are single-person households that were dispatched by the district education office as elementary school teachers.

5 There are three Khmu households in Hatsa, but the village can be defined as a Lao village in this report because the Lao form an overwhelming majority.

6 The Khmu’s own calendar that consists of 10 days as one unit corresponds to neither the Gregorian calendar, the solar calendar, nor the lunar calendar. They simply count it from the first day to the tenth day: the first day is “Mu Mung”, the second day is “Mu Pak”, the third day is “Mu Kat”, the fourth day is “Mu Kot”, the fifth day is “Mu Huang”, the sixth day is “Mu Tao”, the seventh day is “Mu Ka”, the eighth day is “Mu Kap”, the ninth day is “Mu Hap”, and the tenth day is “Mu Huay”.

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Table 1  Profile of the Study Villages, 2001

<table>
<thead>
<tr>
<th>Village Name</th>
<th>Settlement Name*</th>
<th>Ethnic Group</th>
<th>Main Religion</th>
<th>Household</th>
<th>Population</th>
<th>History (Years)</th>
<th>Altitude** (m)</th>
<th>Access from Ou River*** (min)</th>
<th>Facilities****</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheang Neua</td>
<td>Upper</td>
<td>Khmu</td>
<td>Animism</td>
<td>28</td>
<td>168</td>
<td>300</td>
<td>960</td>
<td>128</td>
<td>Thresher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>Khmu</td>
<td>Animism</td>
<td>30</td>
<td>172</td>
<td>2</td>
<td>485</td>
<td>218</td>
<td>Thresher, Electricity, Incomplete School</td>
<td>Upper settlement will move to lower settlement within 2002.</td>
</tr>
<tr>
<td>Cheang Kang</td>
<td>Upper</td>
<td>Khmu</td>
<td>Animism</td>
<td>45</td>
<td>248</td>
<td>200</td>
<td>830</td>
<td>128</td>
<td>Thresher, Incomplete School</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>Khmu</td>
<td>Animism</td>
<td>20</td>
<td>109</td>
<td>16</td>
<td>450</td>
<td>Riverside</td>
<td>Thresher, Electricity, Incomplete School</td>
<td></td>
</tr>
<tr>
<td>Phonsana</td>
<td>Mok Ouay</td>
<td>Khmu</td>
<td>Animism</td>
<td>33</td>
<td>229</td>
<td>150</td>
<td>1040</td>
<td>130</td>
<td>Thresher, Incomplete School</td>
<td></td>
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<td></td>
<td>Phonsana</td>
<td>Khmu</td>
<td>Animism</td>
<td>51</td>
<td>315</td>
<td>21</td>
<td>400</td>
<td>Riverside</td>
<td>Thresher, Complete School</td>
<td>Merged with Mok Ouay in 2000.</td>
</tr>
<tr>
<td>Pak Bout</td>
<td>Khmu</td>
<td>Buddhism</td>
<td>26</td>
<td>135</td>
<td>19</td>
<td>400</td>
<td>Riverside</td>
<td>Thresher, Electricity, Incomplete School, Temple</td>
<td>Merged with Cheang Tai in 1999.</td>
<td></td>
</tr>
<tr>
<td>Om Mok</td>
<td>Lao</td>
<td>Khmu</td>
<td>Animism</td>
<td>19</td>
<td>139</td>
<td>19</td>
<td>800</td>
<td>286</td>
<td>Thresher, Incomplete School</td>
<td></td>
</tr>
<tr>
<td>Htas</td>
<td>Lao</td>
<td>Buddhism</td>
<td>57</td>
<td>3</td>
<td>270</td>
<td>350</td>
<td>400</td>
<td>Riverside</td>
<td>Thresher, Health Center, Water Supply, Electricity, Complete School, Temple</td>
<td></td>
</tr>
<tr>
<td>Pak Luang</td>
<td>Lao</td>
<td>Khmu</td>
<td>Animism</td>
<td>21</td>
<td>15</td>
<td>188</td>
<td>300</td>
<td>400</td>
<td>Riverside</td>
<td>Thresher, Electricity, Incomplete School</td>
</tr>
<tr>
<td>Nyot Si</td>
<td>Hmong</td>
<td>Lao</td>
<td>Animism</td>
<td>34</td>
<td>225</td>
<td>18</td>
<td>1015</td>
<td>179</td>
<td>Thresher, Incomplete School</td>
<td></td>
</tr>
<tr>
<td>Khong Mone</td>
<td>Khmu</td>
<td>Buddhism</td>
<td>40</td>
<td>211</td>
<td>33</td>
<td>590</td>
<td>243</td>
<td>Thresher, Incomplete School</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Surveyed and interviewed by author and IRAP Luang-Phabang 2000.
* Main village that has a village chief is shown as a shaded settlement.
** Measured by GIS using DEM converted from 1/100,000 Topographical Map.
*** Calculated by author using GPS track log in dry season.
**** Electricity is generated by hydraulic motor made in Vietnam. “Complete School” has 5 Grades of primary school (in theory, compulsory in Laos). “Incomplete School” has the lower 2 grades only.
of Houay Gay, a Lao village that moved to Sop Kin at few kilometers down the Nam Ou in 1980. In another case, Nyot Si featured another settlement some 2 hours walk westwards in addition to present settlement (it was a semi-sedentary settlement). Both settlements were moved every few years depending on the requirements of swidden rotation. They decided to settle down in the present location in 1983 because the soil of that mountain for swidden agriculture was rich in comparison with others. The history of Nyot Si only goes back 18 years but the total history of the settlement entails goes back over 100 years, inclusive of the semi-sedentary period.

In addition, the study area includes two branched off settlements. These are Cheang Nuea Lower settlement and Cheang Kang Lower settlement. Cheang Nuea Lower settled at the Nam Luang riverside after branching off from Cheang Nuea village in 1999. The remaining village is called Cheang Nuea Upper. After settling down, Cheang Nuea Lower installed electricity by using micro-hydro units from the Nam Luang (Photo 3). In addition to this, an elementary school was built by the district education office, and villagers could benefit from improved accessibility to the main river because the Nam Luang is navigable using a small boat or bamboo raft in the rainy season. The upper settlement is planning to move to the place where the lower settlement settled.

Taking another example, in 1985, Cheang Kang Lower was built at the Nam Ou riverside by nine households that branched off from their mother village. After that, 11 households also moved, requiring better access to the main river. Therefore, 20 households are living there now. At the time when they moved, all the villagers had planned to settle at the Nam Ou riverside. However, the mother village did not settle down at the Nam Ou riverside because the forest soil for swidden agriculture is not
rich and people in Cheang Kang Lower could not collect the NTFPs that contribute to their cash income as much as villagers in the mother village could.

Branching off has to been carried out only within the village boundary. The reason for separating from the mother village is that these settlements wanted to get good accessibility to the river and better infrastructure. Even though a settlement has branched off, the two settlements are viewed administratively as the same unit, and social connections between the two are strong.

The social infrastructure of the studied area is very poor. Regarding health facilities, there is nothing other than the Hatsa health center. It was constructed in 1999 with the assistance of UNV and the Swiss Red Cross, and now a nurse who was dispatched by the district health office is stationed at the health center. Before 1999, there was no modern medical facility, so people living in the study area had to rely on theotherapy by traditional healers or had to purchase medicines at the Hatsa pharmacy. The educational facilities are also poor. Although 5 years’ elementary school is compulsory in Laos, there are only two complete elementary schools in the study area. Most of the schoolchildren cannot go to 3rd grade because there is no school within walking distance. The poor educational situation is also a result of the lack of schoolteachers. While the district education office is trying to send teachers to elementary schools, it is difficult to find teachers who are able to live in remote areas. Two elementary schools in Cheang Nuea Lower and Houay Si have not been allocated teachers from the district education office; accordingly, the settlement is operating the school themselves, selecting and employing the teacher from amongst the villagers. The educational background of teachers is limited to elementary level and they do not have sufficient qualifications to get a teacher’s license.

Turning now to the markets, there are two official marketplaces at Phonsana and Pak Bout. A market is held once every 10-days according to the Khmu calendar. Phonsana market and Pak Bout market are held on the third day (Mu Kat) and on the tenth day (Mu Hoay) respectively (Photo 4). Most of stalls at the market come from Hatsa and Pak Luang, and Muang Khoa in Phongsaly province. Hatsa and Pak Luang open stalls at Houay Chanum market which is held on every ninth day (Mu Hap) in Khoa district of Phongsaly province. The markets are playing an important role as places to sell necessities and to buy agri-forest products. This report shall return to this subject later.

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7 The schoolteacher in Ngoi district has to work for a school in a remote area on a 3-year contract.
Settlements in the study area have often moved their location in order to improve their social infrastructure and accessibility. As a result, some problems may have been solved. Nevertheless, so far these villages are restricted to river transportation only. Many people in the study area have little opportunity to access complete elementary schools and health services. They still suffer the disadvantages of inaccessibility compared with the roadside villages.

II-2 Occupational structure

Agricultural activities are playing a central role in the economy of the study area. Over 90 percent of households are engaged in agricultural activities (Table 2). In addition, non-agricultural activities such as technical work\(^8\), general store management, agri-forest products brokerage, elementary school teacher, nurse and resident officer are found in the study area. Elementary school teachers, a nurse and a resident officer are public servants belonging to the Ngoi district office, and most of them come from another area. Non-agricultural activities in the study area, therefore, are limited to technical work, general store management and agri-forest products brokerage.

It must be said that the mountainous area does not lack variety in terms of type of work, unlike urban areas. One of the reasons for this is that people in the mountainous area have learned necessary techniques and skills for a living from daily life which depends on self-sufficient agriculture. For example, people make knives and farming

\(^8\) Technical work is defined as involving an occupation that requires some special skill, such as building a house, making a boat and being a blacksmith.
<table>
<thead>
<tr>
<th>Village Name</th>
<th>Settlement Name</th>
<th>Location</th>
<th>Ethnic Group</th>
<th>Household</th>
<th>Agricultural Activity*</th>
<th>Non-agricultural Activities**</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheang Neua</td>
<td>Upper Mountain</td>
<td>Khmu</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower Mountain</td>
<td>Khmu</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cheang Kang</td>
<td>Upper Mountain</td>
<td>Khmu</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower Riverside</td>
<td>Khmu</td>
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<td>0</td>
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<td>0</td>
<td></td>
</tr>
<tr>
<td>Mok Ouay</td>
<td>Mountain</td>
<td>Khmu</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Phonsana</td>
<td>Riverside</td>
<td>Khmu</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Houay Si</td>
<td>Mountain</td>
<td>Khmu</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pak Bout</td>
<td>Khmu</td>
<td>26</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Houay Lo Young</td>
<td>Mountain</td>
<td>Khmu</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Houay Lo Sung</td>
<td>Mountain</td>
<td>Hmong</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Om Mok</td>
<td>Mountain</td>
<td>Lao</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pak Luang</td>
<td>Lao</td>
<td>21</td>
<td>1</td>
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<tr>
<td>Nyot Si</td>
<td>Mountain</td>
<td>Lao</td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Khong Mone</td>
<td>Mountain</td>
<td>Khmu</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total***</td>
<td></td>
<td></td>
<td>516</td>
<td>467</td>
<td>5</td>
<td>20</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: Surveyed and Interviewed by author

* All farmers are practicing swidden agriculture in the study area.
** Number in parentheses shows the number of household doing agricultural activities.
*** Technical work refers to an occupation that requires some special skills such as house building, a house, boat making and working as a blacksmith.
**** Total number of occupations is not equal to the number of households, because some households are doing more than one activity.
tools by themselves using a public workshop with bellows (Photo 5). Moreover, constructing or repairing a house is collaborative work performed by the settlement. As it were, all villagers are a blacksmith and a carpenter. These technical works would not be economically feasible as forms of vocational work in the mountainous area. People engaged in technical work (Table 2) are only living at Hatsa and Pak Luang located at the Nam Ou riverside, not in the mountainous settlements.

Photo 5  Smithing Work at Public Workshop in Khong Mone (Mar. 2002)

The most widely seen non-agricultural activity is agri-forest products brokerage, and the next is general store management. General store management is only observed at the Nam Ou riverside settlements. Besides this, agri-forest products brokerage is also mostly introduced to the settlements of the Nam Ou riverside. Agri-forest products brokerage is divided into three levels by spatial range. First, a Level-1 broker purchases the products from everywhere in the study area and then sells these to brokers or exporters living outside the study area. Secondly, a Level-2 broker purchases the products from within the study area and sells these to Level-1 brokers. Thirdly, a Level-3 broker purchases the products only from within the same village and sells these to a Level-1 broker. To run a brokerage business, a broker must buy a license (Thavian), but only 11 brokers have such a license.

Let us consider the relationship between ethnicity, settlement location and economic activities. The results are shown in Fig. 2. Khmu households are mostly engaged in agricultural activities, both at the riverside and in the mountainous area. All Hmong households are living in the mountainous area and engaging in agricultural activities. Only two Hmong households are engaging in non-agricultural activities as a side job.
Fig. 2  Relationship between Ethnic Group, Village Location and Economic Activities in Studied Villages, 2001

*Source:* Surveyed by author
Lao households are living at the Nam Ou riverside, with the exception of a teachers’ household dispatched from the Ngoi district office. The ratio of agricultural and non-agricultural activities of the ethnic Lao is almost the same. While many Khmu households are living at the Nam Ou riverside, the incidence of non-agricultural activities is not as high as in Lao households. The occupational structure of the study area cannot simply be described in terms of the remarkable contrast between the Nam Ou riverside and the mountainous area. It is more complicated than this, since there are significant variation according to both ethnicity and the settlement locations. To understand the occupational structure, both the geographic location of the settlements and the ethnicity of their occupants must be considered.
III Spatial structure

III-1 Relationship between economic activities, ethnicity and location

Annual income in the study area is shown in Fig. 3. Although the main economic activity is rice farming in the study area, the income from rice is very low in comparison with the others. It means that people are growing rice for personal consumption, and it does not contribute to income. Rice is only sold when people need money or they have surplus rice.

Cash crops are a major contributor to cash income for three Hmong settlements in the mountainous area. There are only two cash crops in the study area: sesame and opium, but opium poppy is being cultivated only in Hmong settlements. Therefore, the cash crop income of Hmong settlements comes from opium sales, and the cash crop income of the other villages is derived from sesame sales.

Income from non-timber forest products\(^9\) (NTFPs) is the biggest cash income source for the villages located in the mountainous area. There are many kinds of NTFPs in the study area, but only seven kinds of these are readily marketable: cardamom, benzoin, mulberry paper, rattan seed, tiger grass, *Kha* seed and *Puack Muack* (*Sapan*). The activity of collecting NTFPs is especially popular in the mountainous settlements of the Khmu. The people of Hatsa collect absolutely no NTFPs.

Raising livestock is a widely observed practice in the study area. Above all, Pak Luang, Hatsa, Phonsana and Mok Ouay are active in raising livestock. Pak Luang and Hatsa in particular practice pig-raising. They buy piglets from neighboring villages and then fatten them up to sell outside the village.

Fishing is practiced at settlements along the Nam Ou riverside. Fishing in the study area is not carried out as a commercial activity. People sell fish if there is demand, but many households along the riverside go fishing for the purpose of personal consumption.

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\(^9\) The term “non-timber forest products (NTFPs)” is sometimes replaced by the term “non-wood forest products (NWFPs)” in papers, reports and books. The meaning of both is the same.
**Fig. 3** Economic Activity by Settlement, 2001

*Source: Surveyed by author*
Income from agri-forest products brokerage is limited to certain settlements. The commercial activities of Pak Luang and Hatsa in particular have distinctive features. While the income from NTFPs’ collection of these two villages is comparatively low or zero, brokerage income is very high. Moreover, general store management is seen only in those two villages, and it includes income from marketplaces. General store managers of Pak Luang do not open the store in the village, so that they obtain all income from the market. Agri-forest products brokerage and general store management make high incomes for them, and it follows from this that those two villages are specialized in commercial activities.

As another illustration of the economic situation in the study area, we shall discuss annual expenditure (Fig. 4). Calculating annual expenditure is very difficult because the expenditure is very wide-ranging. This report explains annual expenditure on rice as an example. Regarding the location, there is little difference between the riverside settlements and the mountainous settlements. In commercially-oriented villages such as Hatsa and Pak Luang, a slice of income from non-agricultural activities is used for rice expenses; therefore, the expenditure on rice is high. On the other hand, the other villages also expend a lot of money on rice in spite of putting much effort into cultivating rice. It means that they are short of rice. The important point to note is that Hmong villages feature very little expenditure on rice. It is a mistake to think that only Hmong settlements have large areas of swidden fields or rich soil for rice cultivation. Hmong settlements are also short of rice in the same way as Khmu and ethnic Lao settlements. The difference in rice expenditure among the ethnic groups can be ascribed to differences in food culture. A staple food of the Lao and Khmu is sticky rice (Kao Nyao), but the Hmong rely on ordinary rice (Kao Chao). It cannot be said which is better. Sticky rice makes one feel fuller for longer but it must be steamed to eat, so that it is not easy to mix with other foodstuffs. Lao and Khmu must buy additional rice when rice is lacking. On the other hand, ordinary rice is able to be mixed with other foodstuffs because it has to be boiled in order to be made edible. Hmong people can stave off hunger by boiling rice mixed with many kinds of cereals and tubers such as corn, cassava, taro and yam, thereby avoiding the imperative to buy rice when rice is lacking.

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10 Simana and Preisig state that “Khmu can be mashed and mixed under the steamed sticky rice.” However, this method of cooking is rarely observed in the study area. Simana, S. and Preisig, E. (1997). “Khmu’ livelihood: Farming the forest.” Vientiane: Institute for Cultural Research, Ministry of Information and Culture, p. 78.
Fig. 4  Annual Expenditure on Rice by Settlement Location, 2001

Source: Surveyed by author
III-2 NTFPs in the study area

NTFPs, as mentioned before, greatly contribute to cash income in the study area. The details of realizable agri-forest products are shown in Table 3 (Photo 6, 7, 8, 9, 10 and 11). Cardamom is sometimes categorized as a cash crop because it is cultivated in the southern part of Laos, but people in the study area collect wild cardamom. People can collect and sell some NTFPs throughout the year. Cardamom, benzoin and opium fetch high prices for people living in the mountainous area.
Table 3  Characteristics of Non-timber Forest Products and Cash Crops

<table>
<thead>
<tr>
<th>Local Lao Name</th>
<th>English Name</th>
<th>Japanese Name</th>
<th>Scientific Name</th>
<th>Type</th>
<th>Product</th>
<th>Crop Season</th>
<th>Local Purchase Price in 2001</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-timber Forest Products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mak Neng</td>
<td>Cardamom</td>
<td>カルダモン</td>
<td>Amomum villosum</td>
<td>Perennial</td>
<td>Seed</td>
<td>Aug.-Sep.</td>
<td>15,000 (kip/kg)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Nhan</td>
<td>Benzoin</td>
<td>安息香</td>
<td>Styrax tonkinensis</td>
<td>Tree</td>
<td>Gum</td>
<td>Apr.-May</td>
<td>45,000 (kip/kg)</td>
<td>Perfume, Medicine</td>
</tr>
<tr>
<td>Po Sa</td>
<td>Paper Mulberry</td>
<td>カシノキ</td>
<td>Broussonetia papyrifera</td>
<td>Plant</td>
<td>Bark</td>
<td>Year-round</td>
<td>2,000 (kip/kg)</td>
<td>Incense, Paper</td>
</tr>
<tr>
<td>Mak Wai</td>
<td>Rattan</td>
<td>並木</td>
<td>Alpinia bracteata</td>
<td>Perennial</td>
<td>Seed</td>
<td>Jul.-Sep.</td>
<td>4,000 (kip/kg)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Khem</td>
<td>Tiger Grass</td>
<td>ホウキギ</td>
<td>Thysanolaena maxima</td>
<td>Annual Plant</td>
<td>Flower</td>
<td>Mar.-May</td>
<td>2,500 (kip/kg)</td>
<td>Broom</td>
</tr>
<tr>
<td>Cash Crop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mak Nga</td>
<td>Sesame</td>
<td>ゴマ</td>
<td>Sesamum indicum</td>
<td>Annual Plant</td>
<td>Seed</td>
<td>Oct.-Dec.</td>
<td>3,000 (kip/kg)</td>
<td>Food, Edible Oil</td>
</tr>
<tr>
<td>Ya Fin</td>
<td>Opium</td>
<td>オピウム</td>
<td>Papaver somniferum</td>
<td>Annual Plant</td>
<td>Seed</td>
<td>Mar.</td>
<td>500,000 (kip/pong*)</td>
<td>Medicine, Drug</td>
</tr>
</tbody>
</table>

Source: Surveyed by author

* Pong is a standard unit of weight used in South East Asia for opium only. 1 pong is equivalent to 0.375 kilograms. (U.S. Department of Justice 2001)
For the present, it may be useful to look more closely at some of the more important features of NTFPs collection depending on village location and ethnicity (Fig. 5). Firstly, Lao households that are living at only the Nam Ou riverside do not collect benzoin and do not cultivate opium. Secondary, Khmu households that are living at any height collect all kinds of NTFPs and cultivate sesame. Finally, Hmong households that are living at a height of over 800 m have an interest in high price products such as benzoin and opium. Collection and cultivation of agri-forest products can be characterized thus: income from benzoin increases in proportion to height, and opium is cultivated only in Hmong settlements.

Benzoin is obtained from the *Styrax tonkinensis* tree, which is widely found in secondary forest located in swidden fields in the study area. People can collect benzoin gum from trees aged from 5-7 years up to 11-12 years located at a height of over 600-700 m. Benzoin trees in the lowlands are sapless even if they are tapped. The higher the altitude, the more benzoin can be obtained. For example, on the one hand people of Pak Bout can start to collect benzoin from 6 years fallow fields at a height of about 600 m; on the other hand, people of Cheang Kang Upper can start to collect it from 5 years fallow fields at a height of about 800 m. It depends on tree age and altitude. No one can get it at a height of below 600 m. Hatsa and Pak Luang where many Lao are living do not have swidden fields in the highlands - this is the reason that Lao households do not collect benzoin.

### III-3 Market and agri-forest products brokerage

River transportation using the Nam Ou is used for the transportation of both goods and people in the study area that lack access to principal towns by road. In such remote areas, riverside markets are playing the biggest role in providing daily necessities to the mountainous settlements. In the study area, people go shopping in Pak Bout market and Phonsana market once every 10-days (Fig. 6). Some settlements stand outside the range of the two markets, but they go to shop in Hatsa where 15 general stores are open every day.

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Fig. 5 Average Income of Agri-forest Products by Altitudinal Zone, 2001

Source: Surveyed by author

* Measured by GIS using DEM converted from B.Ngoi-Nua and Khoa 1/100,000 topographical maps

** Calculated by author using GPS track log
Linkage between the Market and Settlements in Study Area

Fig. 6 Market System, 2001-2002

Source: Surveyed by author
Stalls in Pak Bout and Phonsana markets come from Hatsa, Pak Luang and villages outside the study area, mostly Muang Khoa of Phongsaly province. General store managers in Hatsa and Pak Luang also open stalls in Houay Chanum market, which is opened every ninth day (Mu Hap) and is located upstream of the Nam Ou in Phongsaly province. General store managers along the riverside open their stall at three markets on the move. As shown in Fig.6, in Pak Bout market on the date of 29 November 2002, 25 out of 47 stalls came from Phongsaly province. On the other hand, in Houay Chanum market in Phongsaly on the date of 8 March 2001, 10 out of 39 stalls came from the study area.

Stalls deal largely in small general merchandise such as sundries, appliances and foods. Table 4 shows the result of categorizing each of the stalls by main line of merchandise. It is understandable that there are many stalls dealing in sundries. Moreover, Chinese merchants who are temporarily living in Muang Khoa come down to sell Chinese electrical products such as radios, radio-cassette recorders, alarm clocks and various types of tools.

The functions of these markets are not only to sell merchandise, but also to buy agri-forest products from people. In the marketplace, many brokers come to purchase agri-forest products (Photo 12). Some stalls double as seller and broker. Villagers in the mountainous settlements bring their agri-forest products and sell these to brokers; the villagers then use the money they earn to buy things. Some villagers barter their product for salt, lamp oil, bedclothes and medicine. Stalls accepting barter trading only purchase small and valuable products like benzoin and cardamom.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sundries</td>
<td>Daily Necessities</td>
<td>6</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Clothes and Bedclothes</td>
<td>8</td>
<td>(20)</td>
<td>(11)</td>
</tr>
<tr>
<td></td>
<td>Lamp Oil and Gasoline</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Medicine</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Appliances</td>
<td>Electrical Products</td>
<td>0</td>
<td>(2)</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Tools</td>
<td>0</td>
<td>(2)</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Watch Repairer</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Foods</td>
<td>Noodle</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Confectionary</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
<td>47</td>
<td>39</td>
</tr>
</tbody>
</table>

*Source: Surveyed by author*
People can sell the agri-forest products directly to brokers, too. In this case, NTFPs collectors’ buyers are fixed. These linkages between broker and settlement are shown in Fig. 7. From this we can see that four geographic ranges of NTFPs trading are formed according to the linkages. What has to be noted is that the range of trading formed by Hatsa extends over a large area. This is wider than the range of Hatsa’s general shop, as shown in Fig. 6. The main reason is that Hatsa supplies the demand for both purchasing NTFPs and selling merchandise. Hatsa is very convenient in comparison to the market which is held only once every 10 days, because at least one of the 11 brokers who purchase peoples’ agri-forest products and one of the general stores will be open everyday (Photo 13). All of this amounts to saying that the market is open everyday at Hatsa. Meanwhile, Pak Luang does not have any trading linkage in spite of being the place of residence of six Level-1 brokers and five general store managers in the village. All brokers and managers mainly carry out their business at the marketplaces, so that no general store managers open their stores in the village. The general store managers go to Luang Phabang and Muang Khoa for purchasing merchandise and lay these in for selling at the marketplace. As a matter of course, they purchase NTFPs from within the village and sell merchandise on demand.

The agri-forest products are sent outside the study area. The products that were purchased by brokers in the study area were transferred to Nong Khiaw by boat. After that brokers in Nong Khiaw sell the purchased products to a broker in Nam Bak or Luang Phabang. Some kinds of NTFPs are directly exported from Nong Khiaw to China. In the case of benzoin, the distribution flow is a little more complicated. A broker in Muang Khoa directly purchases it at the marketplace, and two brokers in
Linkage between Brokers and Villages

Distribution of Brokers/Exporters
Located outside Study Area

* Only brokers/exporters related to the study area are shown in this figure.
** Level-1 broker purchases the products from collectors, growers, Level-2 brokers, Level-3 brokers and the market, and then sells these to broker/exporter living outside study area.
*** Level-2 broker purchases the products from collectors, growers, and the market, and then sells these to Level-1 brokers.
**** Level-3 broker purchases the products from collectors and growers in the same village, and then sells these to the market and Level-1 brokers.

Fig. 7  Spatial Structure of Agri-forest Products Trades, 2002

Source: Surveyed by author
Vientiane also come to purchase it from brokers in the study area. Brokers in Muang Khoa, Nam Bak, Luang Phabang and Vientiane are at once brokers and exporters.

The distribution routes of agri-forest products are shown in Fig. 8. Only a portion of tiger grass and mulberry paper production is used to meet domestic demand in Luang Phabang. The remainder is exported to foreign countries. There are three export points. Firstly, Boten is on the border with China and an export point for cardamom, *Puack Muack*, rattan seed and *Kha seed*. Secondly, Houayxay is on the border with Thailand and is an export point for tiger grass, mulberry paper and sesame to Thailand (Photo 14). A portion of the sesame is eventually exported to Taiwan. Thirdly, Vientiane is on the border with Thailand and is the export route for cardamom to Thailand and South Korea. Benzoin is exported by air directly from Vientiane to France and Germany, not via Thailand.

Fig. 8  Distribution Routes of Agri-forest Products, 2001
Source: Surveyed by author
IV Discussion about the basis for existence of the population in the mountainous Region

VI-1 Geoeconomy in the northern mountainous region of Laos

In the study area, cash income is obtained from the exploitation of natural resources and swidden fields, with the exception of commercial activities. It is worthwhile examining the subject more closely from the geoeconomic point of view.

Actual land use in Cheang Kang Upper is shown in Fig. 9. The collection of NTFPs is closely connected to forest type. Tiger grass is found in short period fallow forests (1-year and 3-year), and Kha seed, paper mulberry and benzoin is collected from long period fallow forest (6-year). In addition, rattan seeds, cardamoms, Kha seeds and Puack Muack are collected from protected forest.

Let us now attempt to extend the observation into the relationship between forest type, altitude, moisture and agri-forest product. Fig. 10 shows the generalized model of forest in northern Ngoi district. Cash crop and subsistence crops are planted in swidden field, so there is no need to explain that sesame (h), upland rice (i), cassava (j) and corn (k) can be harvested from swidden fields. Cardamom (a) is found in clumps in the secondary forests of over 3-4 years of age or in the protected forest; its location is uncorrelated with moisture. Benzoin tree (b), Styrax tonkinensis, is an intolerant tree and is the dominant species in the secondary forest of swidden fields until they are about 15 years of age; it is easy to find everywhere in the study area. As aforementioned, to collect gum benzoin a tree aged 5-6 years at a certain minimum elevation must be chosen for tapping. Therefore, in Fig. 10, benzoin cannot be tapped in secondary forest of 7 years of age in the middle-land, but it can be produced in secondary forest of 5 years of age in the highland. Puack Muack (c) can be often found in secondary forest of 3-4 years of age and in the protected forest, too. The location of paper mulberry (d) is weakly correlated with altitude; it can be grown in moist soil at the waterside. Rattan (e) is one species of climbing palm that grows in mixed Dipterocarp forest, and it can be found in both the protected forest and in the long period fallow fields. Kha (f) is able to grow in all kinds of forests except for the

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12 This is a technical word in forestry. It is sometimes used in the phrase “shade-intolerant tree”. An intolerant tree is not willing to share the sunlight with its neighbors, as it requires full sunlight to grow.
Fig. 9 Relationship between Forest Type and Non-timber Forest Products in Cheang Kang Upper Settlement, 2001

Source: Surveyed by author using GPS
Fig. 10 Generalized Model of Forest Use and Agri-forest Products in Northern Ngoi District

*Agri-forest Products
Cash Crop [h: Sesame]
Subsistence Crops [i: Upland Rice, j: Cassava, k: Corn]
highland and short period fallows. Tiger grass is the annual plant that grows in short period fallows up until they are 3 years of age. After 3 years, it is difficult to grow because the other plants, such as benzoin trees, grow up and cast shade.

Both Fig. 9 and Fig. 10 illustrate that the places for collecting and producing agri-forest products are dependent upon forest type. In particular, benzoin (a very significant contributor to people’s cash income) is closely related to secondary forest. Benzoin production and swidden agriculture go hand in hand – this relation is shown in Fig.11. This figure is an example of swidden cultivation involving 8-year falls. People fallow for 4 years from the year they cultivated in order to wait for benzoin trees to grow. Then, the highlanders can tap trees from 5 years, and even the middle-landers can tap these from 6 years. Therefore, people can collect benzoin from two or three places a year in the case of swidden cultivation involving 8-year falls.

Recently, population pressure has reduced the fallow period of swidden agriculture. Many places in northern Laos have a fallow period of only 4-5 years. In the study area, however, they can maintain a long fallow period in comparison with other places because benzoin production is combined with swidden agriculture.

**VI-2 Spatial structure of agri-forest products distribution**

People who are living in the mountainous area need money at present to buy medicines or to give children a better education, and collecting or planting agri-forest products is indispensable for earning cash. These people realized that NTFPs are valuable for trading with middlemen as long ago as the 14th century\(^\text{13}\).

At present, the distribution flow of agri-forest products from the study area to destinations is very complicated, as shown in Fig. 12. Brokers exist in each regional unit: the study area, a district capital, a provincial capital and a capital. Comings and goings of the products are different, depending on both the brokerage point and the kinds of products. Taking the example of cardamom and benzoin, on the one hand we can see the complicated flows that reach destinations via six brokers; on the other hand, there is a flow that reached its destinations via just one broker who is living in the capital.

\(^{13}\) Stuart-Fox, M. “The Lao kingdom of Lan Xang: Rise and decline.” Bangkok: White Lotus, pp.48-49.
Fig. 11  Swidden System in Combination with Benzoin Production
Non-timber Forest Products
- Cardamom (Mak Neng)
- Benzoin (Nhan)
- Puack Muack (Sapan)
- Paper Mulberry (Po Sa)
- Rattan Seed (Mak Wai)
- Kha Seed (Mak Kha)
- Tiger Grass (Khem)
- Sesame (Mak Nga)
- Opium (Ya Fin)

* Brokers are classified into 3 categories according to range of purchases: Level 3 < Level 2 < Level 1.

Fig. 12 Flow of Agri-forest Products Brokerage, 2001
There are two kinds of Benzoin in the world. One is Siam benzoin that can be produced only near the border of Vietnam in the northern part of Laos. The other is Sumatra benzoin that can be produced in Indonesia and Peninsular Malaysia. Benzoin is mostly used by the flavor and fragrance industries such as cosmetics, foods and cigarettes. Siam benzoin is higher-priced than Sumatra benzoin because of its vanilla-like odor\(^{14}\). The benzoin of Laos is so valuable in the world market that brokers want to purchase as much as possible. The fact that benzoin brokers go to purchase it directly rather than via intermediate brokers (as shown in Fig. 12) reflects brokers’ intentions to purchase as much of the product as possible. In 2000, purchasing competition for benzoin between three brokers has been a feature of the study area\(^{15}\).

Chinese brokers can be observed in a district town. They are coming to purchase cardamom, *Puack Muack*, rattan seed and *Kha* seed at intervals of 2-3 weeks. This example demonstrates that Chinese brokers are extending their trading range to northern Laos.

People in the study area sell their product to brokers and get wide-ranging information on business, urban areas and foreign countries from the brokers. There is thus an unexpected connection between the remote area and the outside world. Plenty of information nowadays is available even in geographically remote areas, because of the existence of the brokers.

**VI-3 The basis for existence of the population in the mountainous region, and future prospects**

The mountainous area’s population exists by keeping a balance between productive activities and commercial activities (Fig. 13). Settlements in the mountainous area feature livelihoods that involve the cultivation of agricultural products, the collection of forest products, the raising of livestock and the hunting of wild animals. These activities are practiced in residential areas, rivers, and agricultural fields such as swidden fields, fallow fields, protected/production forests, cleared fields and pastureland. None of these is isolated from the others, and everything has a mutual

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\(^{15}\) The purchase price in March was around 35,000 kip, and then the price gradually increased to 55,000 kip in May.
<table>
<thead>
<tr>
<th>Producing Systems</th>
<th>Trading Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Swidden Land</strong></td>
<td><strong>Market or Riverside Mercantile Villages</strong></td>
</tr>
<tr>
<td>- Food (Rice, Corn, Starchy Root Crops)</td>
<td>- Food (Rice)</td>
</tr>
<tr>
<td>- Feed (Corn, Chaff)</td>
<td>- Cattle</td>
</tr>
<tr>
<td>- Cash Crop (Sesame)</td>
<td>- Buffalo</td>
</tr>
<tr>
<td>- Firewood</td>
<td></td>
</tr>
<tr>
<td><strong>Non-timber Forest Products</strong></td>
<td><strong>Riverside or Urban Village (Feeder)</strong></td>
</tr>
<tr>
<td>- Benzoin, Tiger Grass, Paper, Mulberry, Bamboo, etc.</td>
<td>- Non-timber Forest Products (Only Benzoin and Cardamom)</td>
</tr>
<tr>
<td>- Wild Animals (Squirrel, Field Mouse, Wild Pig, Deer, etc.)</td>
<td></td>
</tr>
<tr>
<td>- Fruits</td>
<td></td>
</tr>
<tr>
<td><strong>Fallow Lands</strong></td>
<td><strong>Riverside / Urban Village (Forest Products Broker)</strong></td>
</tr>
<tr>
<td>- Non-timber Forest Products (Cattamom, Rattan, Bamboo, Nuts, etc.)</td>
<td>- Pig</td>
</tr>
<tr>
<td>- Firewood</td>
<td>- Non-timber Forest Products</td>
</tr>
<tr>
<td><strong>Protection or Production Forest</strong></td>
<td></td>
</tr>
<tr>
<td>- Woods (Building Materials)</td>
<td>- Cash Crop (Sesame)</td>
</tr>
<tr>
<td>- Non-timber Forest Products (Cattamom, Rattan, Bamboo, Nuts, etc.)</td>
<td></td>
</tr>
<tr>
<td>- Wild Animals (Squirrel, Field Mouse, Wild Pig, Deer, etc.)</td>
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</tr>
<tr>
<td>- Fruits</td>
<td></td>
</tr>
<tr>
<td><strong>Clearing Fields</strong></td>
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<tr>
<td>- Cash Crop (Sesame)</td>
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<tr>
<td>- Vegetables</td>
<td></td>
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<tr>
<td><strong>Pasture</strong></td>
<td></td>
</tr>
<tr>
<td>- Raising Cattle</td>
<td></td>
</tr>
<tr>
<td>- Raising Buffalo</td>
<td></td>
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<tr>
<td><strong>Residential Area</strong></td>
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<tr>
<td>- Raising Pig</td>
<td></td>
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<tr>
<td>- Raising Poultry (Chicken, Duck)</td>
<td></td>
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<tr>
<td><strong>Settlement</strong></td>
<td></td>
</tr>
<tr>
<td>- Fish</td>
<td></td>
</tr>
<tr>
<td>- Aquatic Plants (River Algae: Khai Phaen in Lao)</td>
<td></td>
</tr>
<tr>
<td><strong>Riverside</strong></td>
<td></td>
</tr>
<tr>
<td>- River</td>
<td></td>
</tr>
<tr>
<td>- Riverside or Urban Village (Forest Products Broker)</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 13 The Basis for Existence of the Population of a Mountainous Region in Northern Laos from an Geocological Point of View
relationship geographically. All agricultural fields are in the forest; the water of the river comes from the forest; and livestock raised in the residential areas is fed on corn cultivated in the swidden field. This type of “production systems” has been a constant feature of the region since the period of self-subsistence.

In contemporary Laos, as I mentioned before, people cannot live without money any longer. Therefore, a market in which they can convert agri-forest products into money is needed. Thus far, this report has accounted for the importance of markets like Pak Bout and riverside mercantile villages like Hatsa as the place of conversion to cash. Valuable NTFPs such as benzoin and cardamom are sold directly to brokers who live in urban areas. With livestock, riverside villages in Hatsa and Pak Luang purchase small pigs for fattening. These movements of agri-forest productions with money are defined as the term “trading systems”.

Although connection of producing and connection of trading differ widely from each other in that connection of producing is based on subsistence agriculture, these two types of connection are being naturally maintained by the relationship of inputs and outputs through the settlement (shown as Fig. 13). It can be said that this is characteristic of the basis of existence in the mountainous region. In order to develop the mountainous area, the developer should not simply promote agricultural activities but must provide opportunities to sell goods as well. This might have a multiplier effect on both agricultural development and trading development.

However, there is some possibility of losing the balance in the future. Possible impacts on the producing systems are political regulations against forest utilization, prohibition of opium cultivation by going with the tide, and ecocide caused by inappropriate land or forest use. In addition, market fluctuations and the taxation system of the government influence people's activities. For example, a fall in the market price of NTFPs, especially, is reflected in the price of purchase even in the mountainous area. Thus, it has a direct impact on the lives of people depending on income from NTFPs. Trading tax is very high in Laos (Fig. 14), and the current high rate of taxation of agri-forest products trading makes it difficult for brokers to save funds with which to purchase agri-forest products. This may mean that brokers are unable to purchase products, even though people in the mountainous area want to sell them.

The most likely impact at present is due to political regulations against forest
### Brokerage Point Marketing Price* Cost*

<table>
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<tr>
<th>Collector or Market in Study Area</th>
<th>38,000 kip/kg (US4$/kg)</th>
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| Broker (Nam Ou Riverside)         | 42,000 kip/kg (US4.4$/kg) | Brokerage Permission Fee 500,000 kip/year (US52.6$ year)  
|-----------------------------------|--------------------------| 

| Broker (Nong Khiaw, Nam Bak)      | 45,000 kip/kg (US4.7$/kg) | Brokerage Permission Fee 700,000 kip/year (US73.7$ year)  
|-----------------------------------|--------------------------| 

| Exporter (Luang Phabang/Vientiane) | Grade A: US10.5$/kg  
Grade B: US9$/kg  
Grade C: US8.5$/kg  
Grade D: US7$/kg  
Grade E: US6$/kg | Brokerage Permission Fee 1,500,000 kip/year (US157.9$ year)  
Shipping Charge between the Village and Vientiane Office  
Packaging and Shipping Charge to Foreign Customers in France and Germany  
Electricity Charges (Air Conditioning for Storehouse)  
Labor Costs (Cleaning and Sorting)  
Bank Interest Charge (Loan for Purchase Fund)  
Income Tax  
Export Tax |

#### * US$ was equivalent to 9,500 kip as of April 2002

**Fig. 14** Market Price and Cost of Benzoin at Brokerage Point, 2002
utilization. According to the Land Law\textsuperscript{16} and the Forest Law\textsuperscript{17}, a household can hold up to only 3 ha of land for commercial crops and up to 3 ha for orchard, and can receive an allocation of degraded forest land of up to 3 ha. At any rate, according to the manner in which land allocation is actually practiced, people in the mountainous area can use only 3 ha of forest land. This means that they cannot continue to produce benzoin and rice simultaneously, in which case the producing systems and the trading systems become imbalanced, causing grave damage to settlements. This example illustrates the fact that the basis for existence of the population in the mountainous area is fragile, because people depend on the forest for all their productive activities.

\textsuperscript{17} Department of Forestry (1996). “Forest Law” Vientiane: Ministry of Agriculture and Forestry.
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