



World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

Case Study on Bamboo Marketing in Lao P.D.R

ICRAF-SEANAFE Project "Markets for Agroforestry Tree Products"



1 Introduction

1.1 Background

Bamboo is non timber forest product, which can found in the tropical and sub tropical zones. It is fast growing and easy regeneration species. Bamboo is a desirable plant for sustainable management; it has important direct and indirect economic and environmental benefits such as providing shoot for food, culms for housing, furniture, handicraft products and soil and water conservation. Bamboo can play an important role in the reduction of wood consumption, environmental and forest protection, poverty alleviation and sustainable development of rural economy.

In Laos has at least some bamboo in almost every province. According to Department of Forestry report, in 2004 the total pure bamboo forest is approximately 18821.50 ha and 45%-60% of bamboo growth in upper mixed deciduous forest of 530,156.00 ha. Provinces with a largest reserve of bamboo included Vientiane province, Vientiane municipality, Houaphan and Oudomxay Province. A part of the natural resources, there are considerable household planting of few bamboo species in and around almost every village in Laos. These are the based uses and selling.

Concerning to the bamboo uses in Laos, bamboo processing as an income generating or business activity is largely un-developed. To the extent of bamboo processing sector, it is primarily based around handicraft and other household processing, especially in the rural areas. A small number of more commercial bamboo processing businesses are currently operating around Vientiane. However, many bamboo resources were harvested and exported to the neighbouring countries, especially Thailand and Vietnam with a very little return to the Lao local people. Referring to the report Oxfam Hong Kong/MPDF, project 2006, the slat bamboo exported from Viengxay District to Viet Nam in 2005 of 5000 Tons. The price of the bamboo is only 240 000 kip/ Ton (24 USD/Ton). In extent villagers can get only 20 USD/Ton. On the other hand in Sangthong District, they exported bamboo mat 1500 pieces (1000 bamboo mats for tobacco drying and 500 bamboo wall mat) per week. The price of tobacco drying mat is only 9 Thai Bath (0.2 USD)/piece (about 2 culms per mat) and 2 USD for wall mat (about 10 culms per mat). In these extent villagers can get only 4 Bath/piece for tobacco drying mat and 50 Bath/piece for wall mat. Constraints in the market chain such as lack of marketing information, high cost of transportation, limited market, too many taxes and many middle men in the market chain are causes, which prevent farmers from achieving better market access and prices for their products.

This paper is the output of a case study on constraints in marketing of bamboo. The findings and analysis based on fieldwork completed in Vientiane municipality and xiengkhuang Provinces. It is as part of the South East Asia Network for Agroforestry Education (SEANAFE) project. The SEAFE project, supported by International Centre Research Agroforestry (ICRAF), the World Agroforestry Institute, is a network of 76 universities in 5 countries in Southeast Asia such as Indonesia, Philippines, Vietnam, Thailand and Laos to develop market-oriented curricula and teaching materials on Agroforestry Tree Products (ATP). A team of researchers centered on the National University of Laos (NUOL) implemented a case study on marketing of bamboo products. This case study will serve as a basis for participatory curriculum building at the university. Case studies are a good tool for teaching marketing study methods. This case study, bamboo was selected as product with good potential generating income as well as poverty alleviation in rural area. Sangthong district, Phoukouth District and Kham District were selected as a key bamboo production area in Laos, (please see figure 1, 2 and 3). It is considered that an appropriately agroforest curricula and teaching materials can provide knowledge on agroforestry tree products in a wide range of area such as resources management, processing management and marketing, in order to help local farmers and traders to get more benefit in term of economic, environmental and social aspect.

1.2 Objectives

The objectives of the study are:

- to conduct market chain analyses for a range of products of bamboo in Santhong district and Phoukod, Kham District.
- to identify the constraints and to point to options for improving income for farmers and traders.

2 Study team

Latsamy Bouphe, lecturer wood processing, NUOL, team leader
Joost Foppes, NTFP adviser, SNV
Phongxiong Wanneng, NTFP curriculum building adviser SNV
Bouakhet Sayasouk, wood processing specialist, Burapha consultants
Bouavieng Souphanthong, economist, lecturer in business management, NUOL
Thongkham and Mr. Oudone Sichaleune camera man/journalist

3 Methodology

Market chain analysis was based on interviews with producers and traders. The emphasis will identify the main constraints within the market channels; the movement of the product through the chain from producer to consumers; the different of product price received and offered at each link of the market chain and the key factors influence the pricing of the products along of the market chain.

This study used an iterative method to identify respondents along the marketing chain:

- Key villages (selected villages); those villages where bamboo was particularly important were identified through interviews with province and district forestry office staffs,
- Key traders and companies were identified through interviews with village collectors, district staff, traders and group interviewing.

Open-ended interviews were held with respondents, using different checklists of questions for different stakeholders. These checklists were prepared by the team during preparatory brainstorming sessions. Four different checklists were used: key questions for bamboo traders and companies, key questions for Provincial agriculture and forestry office (PAFO)/ District agriculture and forestry office (DAFO) staff/ related government organizations, key questions for village head man, key questions for village bamboo producers; and documentary review.

Two provinces were selected for survey such as Vientiane municipality and Xiengkhuang province. Three villages from Sangthong district, Vientiane municipality, two villages from Kham district and one village from Phoukout district Xiengkhouang province by using selective samplings. The survey was conducted by the researcher team centered on National University of Laos with the help of the local staffs of District Agriculture and Forestry Office working as Research Assistants (RAs).

A detailed assessment of each village and factories is attached to this narrative section in annex 1.

Following field work and analysis, the research team hosted the workshop at Sangthong district to validate the results. At this workshop the result were discussed with a range of stakeholders. Participants included producers, traders, processors and representative of village, district authorities, Provincial agriculture and forestry office staff, District agriculture and forestry office staff, District industry and trade office staff and representative of the university.

The objective of the workshop was to allow exchange information and opinion among participants. The prior of the workshop, participants were provided with summary of field work research report and then facilitated the discussions about the problems faced by those involved in bamboo marketing and recommendations. Constrains and recommendations identified at the workshop is given in the annex 3.

The finally the team research was developed a video film.

4. Result

4.1 Bamboo Marketing in Sangthong District

4.1.1 Background of the Study site

Sangthong district is one of the poorest of Vientiane municipality. The distance between Sangthong district and Vientiane municipality is approximately 75km. This district shares the borders with Hinherb district in the north, in the south with Thailand, the east with Phonhong district and Naxaythong district and in the west with Sanakham district. The total land area of the district covers about 5080 ha. There are 18753 people. The district consist 35 villages, with total number of households in the district is 3,288 household with the average of 6 people per household. (Sangthong district office, 2005).



Figure 1: General map of Lao PDR

The villages selected for the present investigation are Napo, Kouay and Houay Tom village. These tree villages have harvested bamboo and made handicraft to generate income. Summary of the livelihoods and resources in three study villages indicates in table 1.

Table 1. Summary of the livelihoods and resources in three study villages

Item	Napo	Kouy	Houy Tom
Total area	2301 ha	2000 ha	
Forest land			
paddy rice	150 ha	240 ha	
Rice production	2.5 tons/ha/yr	2.5 tons/ha/yr	
Population (Households Number)	425 (86)	557 (107)	370 (64)
Ethnic groups	Phouan: 85% Khamu: 15%	Phouan: 95% Khamu: 5%	Phouan: 1% Khamu: 99%
Topography and vegetation	Slop and forest with large area of natural bamboo forest and mountainous with high cover forest	Lowland and slop and forest with large area of natural bamboo forest	Slop and forest with large area of natural bamboo forest
Infrastructure	-Poor, tertiary road to village, -No electricity -Semi-primary school - Two temples	- Poor, tertiary road to village. - No electricity -Primary school - village's clinic	-Tertiary road to village - Semi-primary school - No electricity
Main resources of household income	Rice, Livestock, NTFP and bamboo handicraft	Rice, livestock, NTFP and Bamboo culms	Bamboo culms, NTFP, livestock, and rice

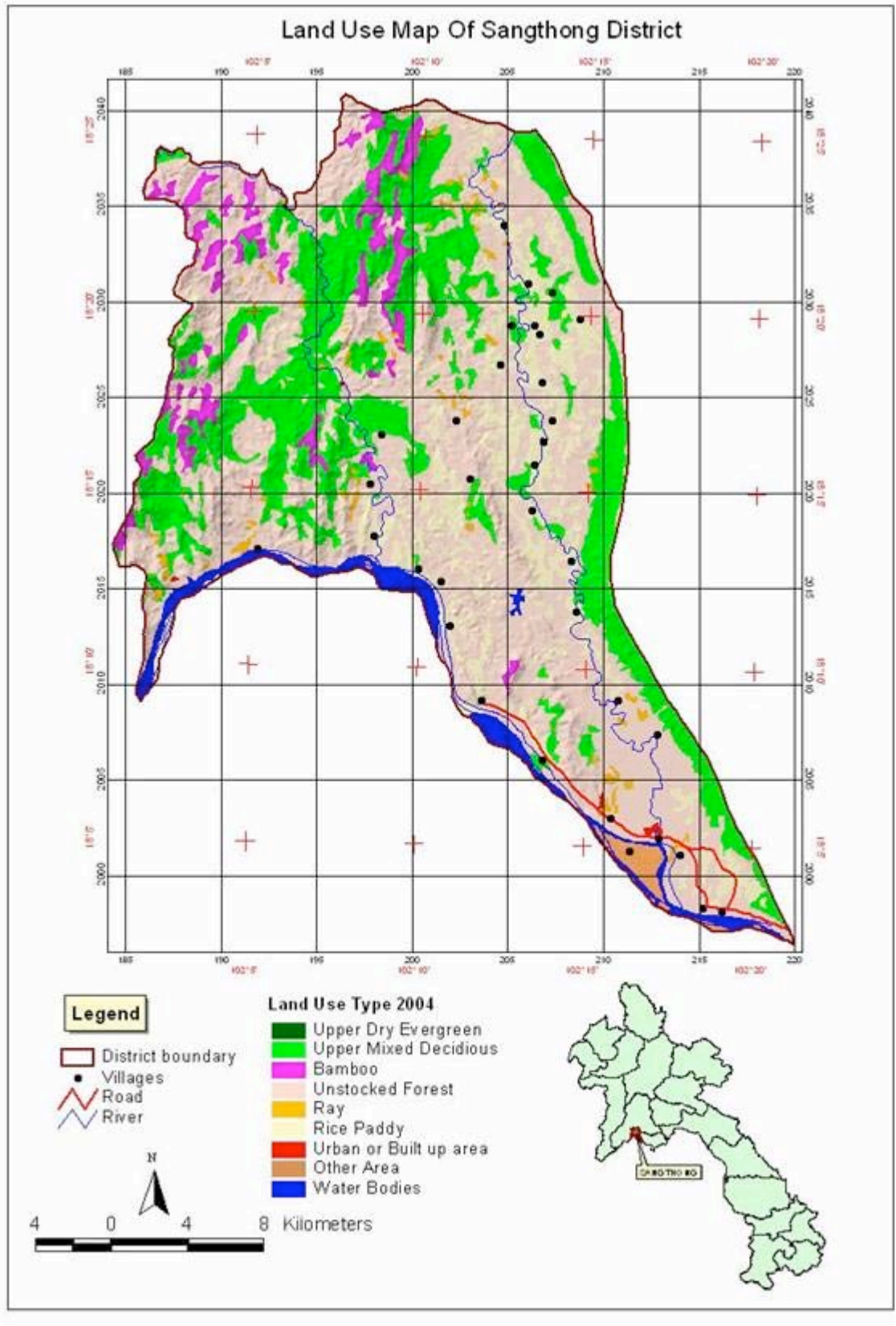


Figure 2. Land Use Map of Sangthong District

4.1.2 Market Chain and Price variation along Market Chain

The main operators on bamboo market chains are farmers, collectors, factory, local traders and foreign traders. The role of farmers is harvesting and mats processing. Collectors, factory, local and foreign traders do different degrees, all are engaged in shorting, storage, processing and transportation.

Napo villagers collect bamboo and process into mats then sell to local traders, who are from Snod village near by Sangthong district. The local traders then sell to Thai traders in Thailand. While, Kouy and Houy Tom villagers collect bamboo in the forest and then sell to the local collectors, who then sell to local traders and toothpick factory in Vientiane. The local trader process in to mats, curtain and vegetable baskets then sell to consumers in Vientiane. The toothpick factory process in to toothpick, skewer-sticks for barbecuing and for ice-cream "mai siep" and "mai kaling" then sell to consumer around country. In addition to main products, bamboo wastes from toothpick production also sell to the ceremony paper factory in Naxaythong District.

Figure 3 and 4 show the market chain mapping of the bamboo products in Sangthong district.



Figure 3. Market chain mapping of bamboo mats in Napo village

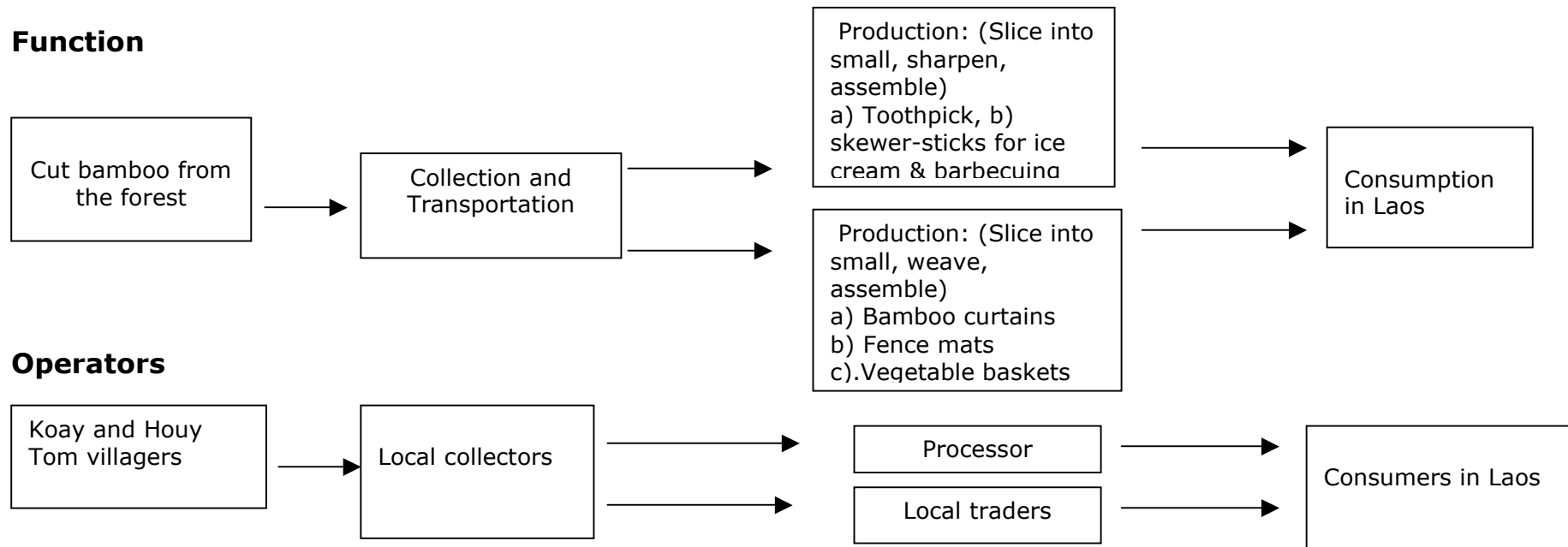


Figure 4. Market chain mapping of bamboo product from Koay and Houy Tom village

1.) Bamboo Harvesting

Sangthong district is one of the rich natural bamboo forests in Vientiane municipality. It has an estimated area of 3,600 ha natural bamboo forests (approximately 70% of the total land area). Bamboo distributes widely in the slop area, along the streams and rivers.

The types of bamboo in the area include: Mai phaang, mai hia, mai bong, mai sod, mai loh and mai lai. The table 1 below lists bamboo species found in Sangthong district.

Table 1. Bamboo species in Santhong District

No	Lao Name	Latin Name	Main uses
1	Mai phang	<i>Dendrocalamus lonoifimbriatus</i>	Mats, Baskets, edible shoots
2	Mai hia	<i>Schizostachyum virgatum</i>	Mats, baskets, edible shoots
3	Mai lai	<i>Oxythenanthera albociliata</i>	Edible shoots
4	Mai sod	<i>Oxythenanthera parvifolia</i>	Baskets, mats, edible shoots
5	Mai bong	<i>Bambusa tulda</i>	Baskets, Edible shoots
6	Mai loh	<i>Dendrocalamus pendulus</i>	Baskets

Main types of bamboo used as edible shoots are: mai hia, mai lai and mai phang, mai bong, mai sod, mai loh, but they are not used commercially. Main types of bamboo sold as poles are: mai phang (*Dendrocalamus lonoifimbriatus*) (70%) and mai hia (*Schizostachyum virgatum*) (30%). A description of some bamboo species grown in Sangthong district is given in Box 1.

Box 1. Bamboo description of the main bamboo species used in Santhong District.

Local name: Mai Phaang

Scientific name: *Dendrocalamus lonoifimbriatus*

Family: *Poaceae/Graminea*

Subfamily: *Bambusoideae*

Use: The wall and fibres of this bamboo species are rigid and not suitable to split into smaller strips for handicraft (normally 0.3-1 cm wide), but the cane is suitable for frame construction, poles and the different uses in house construction and roofing, fencing or for walls for chicken cots, durable to 3 year with out of preservation. Shoots are edible.

Conservation status: Mai phaang has it original habitat in upland and sloping land, it is preferred to well manage for erosion prevention. In the past little propagated because of abundant natural resources but needs improved management due to easy harvest and access.

Processing: Shoots are dried in the sun and stored year round in plastic bags. Bamboo canes are split up into 10-15 strips (each 2-3 cm wide) then dried in the sun and woven into mats.

Propagation: Very sure propagation by stump and seed, easy growing/establishing.

Description: Clustering quite dense (50 stems), not spiny, the average cluster diameter is 2-3 m and the average high is 14 m. The cane characteristic has diameter mean $D = 6.3$ cm, mean wall thick $T = 0.6$ cm, the length of internodes $L = 90-100$ cm. First branch from the ground is about 8 m. Culms sheet dimension is 30x27 cm (base/height), light yellow color, all over hairy. Tip culm sheet erect, 9x9 cm, no hair, auricles medium large with long hair.

Average leaf numbers is 17 and mean leaflet sizes is 3.4x27 cm. Shoot has bitter taste.

Distribution & Ecology: Distribute a long the slope of mountains at elevation of about 500-600 m, mixed with Mai Hia.

Local name: Mai Hia
Scientific name: *Schizostachyum*
Synonym: *Cephalostachyum virgatum Munro and Kurz.*
Family: *Poaceae/Graminea*
Subfamily: *Bambusoideae*

Remark: Taxonomy not clear yet, however the typical drooping and slender tip culms sheet is typical for this genus.

Use: the wall and fibre of this bamboo species are rigid not suitable to split for handicraft but the cane is very suitable for doing house's wall, roofing (durable to 10 years), poles and fishing tools. Shoot is edible. A variety of mai Hia found in dry areas canes are smaller and suitable to make the Lao *khen* music instrument.

Propagation: Very sure propagation by stump, seed is difficult to harvest. It is propagated in home gardens.

Description: Clustering quite dense (60 stems), not spiny, the average of the cluster diameter is about 2-3 m and the average high is 17 m. The cane has an average diameter $D = 4$ cm, wall thick $T = 0.4$ cm, length internodes $L = 74-75$ cm. First branch from the ground $H = 4-5$ m. Culms sheet dimension (base/height) is 5-6.5x18-20 cm, white-yellow color, all over hairy. Tip culms sheet drooping auricles (long) 2x11cm with hair. Average Leaf's number is 8-9, average leaflet sizes 5x24 cm.

Distribution & Ecology: Along the slope of mountains at elevation of about 500-600 m. mixed with Mai Phaang.

Local name: Mai bong
Scientific name: *Bambusa tulda* Roxb.
Family: POACEAE/GRAMINEA
Subfamily: BAMBUSOIDEAE

Use: Bamboo shoots are edible, and used in various ways to prepare with different foods. Canes are also used.

Propagation: Planted as a living fence for canes

Description: Densely tufted, 10-15 together, sympodial species. Culms up to 5-20 m tall, 3-30 cm in diameter, internodes at about 30-50 cm, with tick walls, pale green, covered with white wax when young. Branches are several at each node, from lower nodes. Spikelets green. Culms heats and leaves olive-greenish. Flowering culms are leafless. Glume is yellowish to green or purplish, anthers dull reddish or grayish. Fruits are green. Leaves length are 21-30 cm by 2-3.5 cm wide.

Distribution & Ecology: Found commonly in Vietnam, Laos, Cambodia, Thailand and Myanmar. Growth mixed with other bamboos species, *Helminthostachys zeylanica* and *Amorphophallus* sp., in disturbed forest. Bamboos only flower and fruit once in their lives after 70 years.

Harvesting of bamboo products for commercial in Sangthong district officially follows the quota set by the Vientiane Capital Municipality (the Province, which Sangthong District belongs to). For 2005, the quota was set to be 60,000 poles, for 2006, the quota is 50,000 poles. Referring to interweaving the chief of Province forestry office in Vientiane, province wants to phase out all commercial forest use, logging has already been banned and bamboo cutting should also be phased out. However, a quantity of bamboo harvesting is not checking in the forest, only at the border checkpoints.

Harvesting of bamboo poles is mainly done by men, harvesting of bamboo shoots is mainly done by women, children and elderly.

The villagers harvest bamboo by selecting cutting, only stems older than two years can be cut for commercial use. Bamboo cutting usually is done by men. One man can cut around 100 stems per day. He can carry up to 3 poles of mai Phaang on his shoulders or 5-6 poles of mai Hia each time. Bamboo poles can be harvested all year round, but

most harvesting is done in the rainy season because it is easy to drift them down the streams and rivers (July-October) to sell in Vientiane. Bamboo poles for weaving mats and baskets are mainly harvested in the dry season as villagers have more time to work on this after the rice growing season (November-April).

The interview reported that the quantity of bamboo harvested in 2005 for Napo village is about 15,000 culms, 20,000 culms is Kouy village and up to 70,000 culms is Houy Tom village.

The area under bamboo seems to be getting lower due to clearing for agriculture and over harvesting. A viability of bamboo in village's area is becoming less and less. The area for collecting bamboo is further and further. Villagers are mostly collecting bamboo near by their rice fields, which are fact their land. Usually it is about 1-4 km around the village. The interview reported that in the past used to be available in less than 1 km radius around the village.

2.) Bamboo Production and Products Volume

Bamboo Production:

The main activities of villagers are rice cultivation and agricultural productions. They harvest bamboo only when there are free from agricultural production activities. In fact, bamboo products bring considerable income to villagers. Main bamboo products in Sangthong District are poles, handicraft and shoots.

Bamboo poles can be harvested all year round, but most harvesting is done in the rainy season because it is easy to drift them down the streams and rivers to sell in Vientiane and some of bamboos are transported by trucks.

Villagers in visited villages have long traditional of bamboo handicraft production. The villagers are very skillful. They are engaged in bamboo weaving in the dry season, to make bamboo fence, bamboo mats for tobacco drying, bamboo wall mats, bamboo roof tiles, baskets and other handicraft products.

It is mostly women who weave the mats. Men are the ones who collect bamboo from the forest for their wife and daughters and help cut and chop bamboo. Handicraft productions are very much manual based as well. A big knife and hammer are the only production tools. The production process starts with cutting bamboo culms into needed size.

For producing fences and wall mats, after cutting bamboo culms are chopped into small sticks (about 1.5 cm width) and are rather larger stripes (about 4-5 cm width). After getting sticks, bamboo fence can be started weaving. For wall mats there is another step, which is flattening stripes using knife and hammer. After getting flat stripes, a wall mat can be started weaving. Products are produced by farmers indicate in table 2 below.

Table 2. The products are produced by Napo farmers

No	Product	Size	No of poles used/mat	Product Volumes sold/family
1	Bamboo wall mats for making tobacco drying sheds. They are made from Mai Hia and Mai Phaang.	70x170cm	1-2	300 sheets
2	Bamboo wall mats for house construction. They are made from Mai Hia.	200x300cm	10-15	300 sheets
3	Bamboo mats for fencing garden. They are made from Mai Hia.	170X170cm	10	Variable
4	Bamboo roof tiles	20X60cm	10 tiles per pole	Variable

Local traders in Vientiane are processed in bamboo weaving around year, to make bamboo wall mats, bamboo fence mat, baskets and bamboo curtain.

For producing bamboo basket and bamboo curtain, the process also starts with cutting bamboo culms and chopping into small sticks. Then stick is sliced in thin stripes and refined them, so that they are not sharp. After that stripes are used for weaving basket and bamboo curtain. Curtain production in general is quite time consuming, one curtain one person need time for one week.

Bamboo Products Volume:

It is estimated that in 2005, approximately, 2,580 sheets of bamboo wall mats for tobacco drying, 2,580 sheets of bamboo wall mats are sold to traders in Snod village. This volume is total sum of number of mats produced in Napo village. An addition of this, some amount of

bamboo fence mats and bamboo roof tiles sell to local consumers, who come to the village but not many.

The estimated volume of bamboo culms in 2005 approximately 20,000 culms from Kouy village and about 70,000 culms from Houy Tom village are sold to toothpick factory 20,000 culms and to local traders (small processors) in Vientiane area.

3.) The Market

Bamboo handicraft products are mostly for sale. There are in fact two main channels of distribution bamboo handicraft products in Napo village. First of all, village processors sell about 10% of the products in local market. That means some villagers display the product in front of their houses along the road for selling to passengers, who pass by the village.

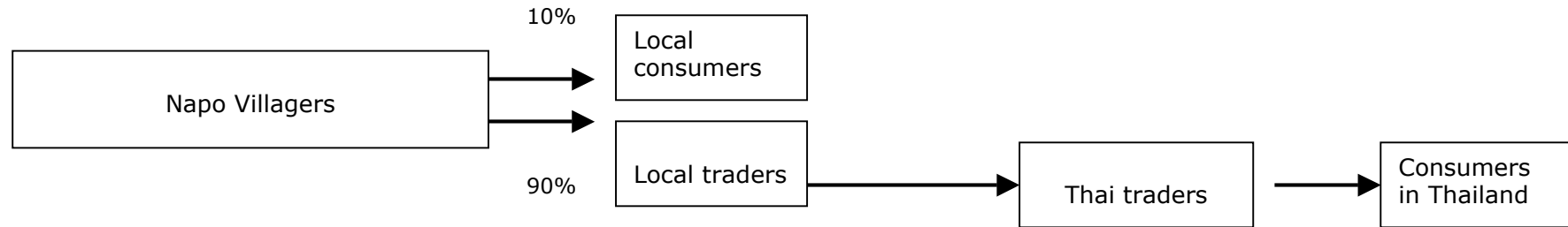
Besides, another 90% of products are sold to the bamboo handicraft trading group in Snod village (near by the village). There is only one group, which was formed since the year 2000. This group has 8 members, who export bamboo handicrafts to Thai traders in Thailand. There are 4-5 main Thai traders, who usually buy the products from the group. The relationship between the trader group and Thai buyers is rather good. They have been trading with each other for many years. The group sometimes gives credit to buyers and sometimes buyers deposit money first depends on demand and supply trend.

Bamboo culm products for Kouy and Houy Tom villages mostly are sold to the local collectors, then the collectors sell to the toothpick factory and local traders in Vientiane city. There are four traders in Vientiane who buy bamboo culms from local collectors, to produce the handicrafts for selling to consumers in Vientiane.

4.) Price Variation along the Market Chain

In 2005-06 the price of bamboo handicraft products are as shown in table 3. The price of products has been constant for 5 years. In general a villager would earn income approximately 3,500,000-4,000,000 kip per year family. Figure 6 shows the price variation along the market chain.

Operators



Prices

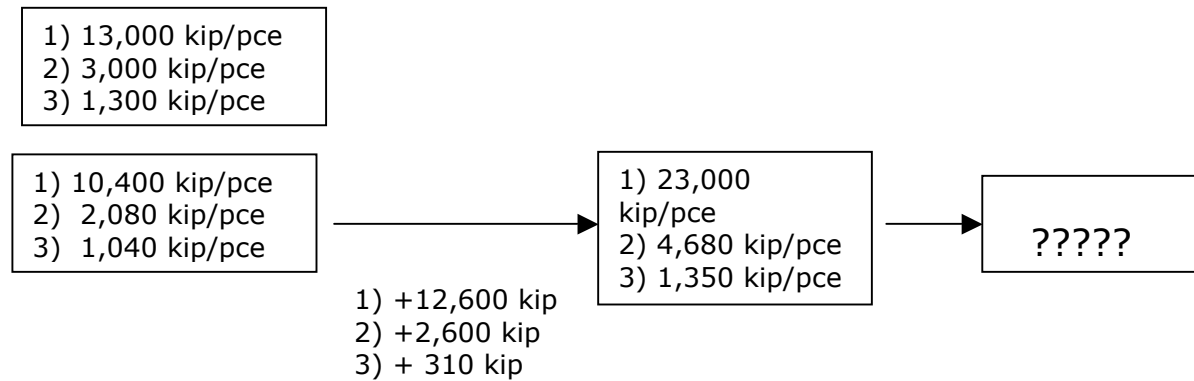


Figure 6. Value chain mapping of the bamboo product from Napo village

Table3. Product price in Napo village

No	Product	Size	Amount/ family/yr	Selling Price per piece in the village for trader/local consumers
1	Bamboo wall mats for making tobacco drying	75x175cm	300	1,040 kip/1,300 kip
2	Bamboo wall mats for house construction	200x300cm	300	10,400 kip/13,000 kip
3	Bamboo roof tiles	20X60cm	variable	300 kip [#]
4	Bamboo mats for fencing gardens	120X170cm	variable	2,080 kip/3,000 kip

[#] - only for local market

The traders usually sell products to Thai traders in Thai side as indicate in table 4 the mark up is only 45% of the buying price of bamboo wall mats for house construction, 44% of buying price of bamboo mats for fencing gardens and only 1% for bamboo wall mats for making tobacco drying sheds.

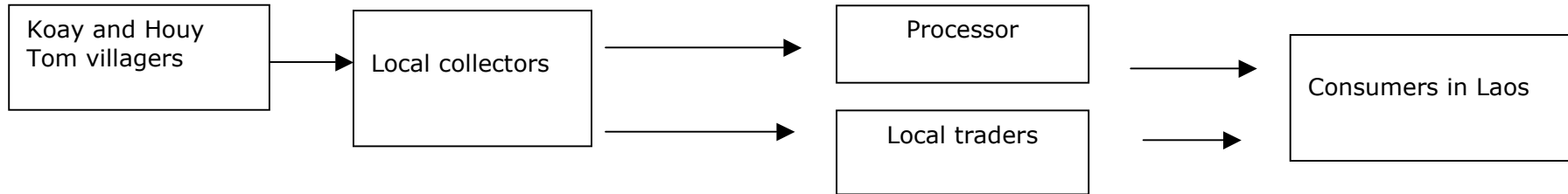
The mains of the business cost are transportation cost, loading and unloading cost and tax (resources tax, village fee).

Table4. Product price in Thai side

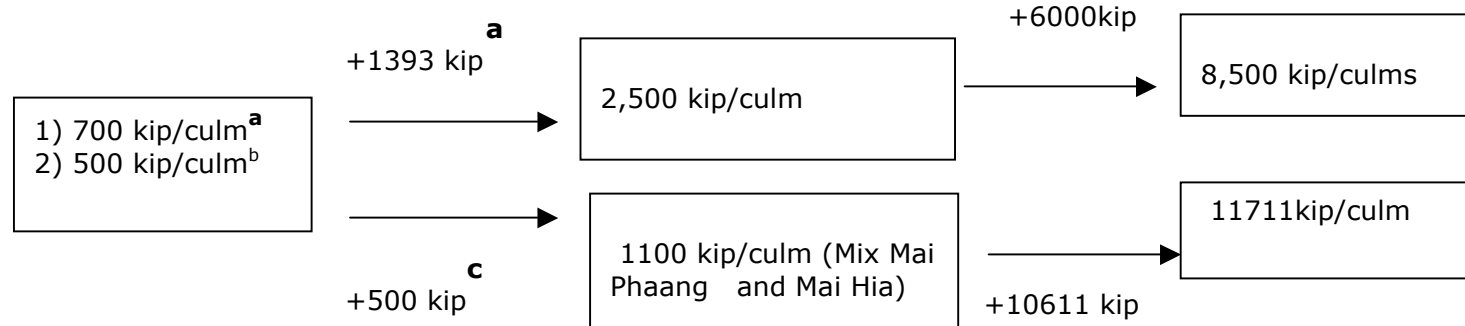
No	Product	Size	Selling Price per piece in Thai border
1	Bamboo wall mats for making tobacco drying sheds	75x175cm	1,350 kip
2	Bamboo wall mats for house construction	200x300cm	23,000 kip
3	Bamboo mats for fencing gardens	120X170cm	4,680 kip

Concern to the bamboo culms product, in 2005-06 the price of bamboo culms in villages are 700 kip for Mai Phaang and 500 kip for Mai Hia. The collectors sell bamboo culms 2,500 kip for Mai Phaang at toothpick factory gate (in Vientiane), 1,300 kip for Mai Phaang and 900 kip for Mai Hia to traders in Kao Lio area. Figure 6 shows the prices variation along market chain.

Operators



Prices



a = Mai Phaang only, **b** = Mai Hia and **c** = mix Mai Hiaand and Mai Phaang

Figure 7. Value chain mapping of the bamboo product from Kouy and Houy Tom village

The selling price for toothpick factory is much higher than Kao Lio traders, because the quality of bamboo culms is better than only with a minimum diameter of 6-7 cm, fresh and transported by truck. Cost of transportation by truck is high one trip 700,000 kip, 50 kip/ pole for resources tax, 150 kip for rehabilitation tax and plus 100,000 kip for fee at check point along travel trip.

Traders process bamboo in to mats, bamboo baskets and bamboo curtains for selling to consumers in Vientiane. Prices of bamboo handicraft product in Vientiane are 12,000 kip per one square meter per pole, 27,000 kip for wall mats (2x3m, 10 poles per mat) and 2600 kip for bamboo basket (one pole can produce 8 baskets).

Vientiane traders, who has quota, they have to pay 50 kip per pole for resources tax, 150 kip per pole for rehabilitation tax, 70,000 kip for Sangthong District fee and 150,000 kip per month to Sikodtabong District, where he lives as income tax and some fee for letter approval.

4.1.3 Market Chain Constraint

The major findings of the field work and the workshop can be summarized in term of six key constraints faced by those marketing bamboo products of farmers in Sangthong district as follow:

1.) Poverty of the villagers

The poverty of village people forces them to accept the lowest prices from buyers and also means that they may be more tempted to engage in illegal and unsustainable activities for need of income.

2.) Effects of the quota system

The quota system has both positive and negative effects on farmers. Provincial government try to reduce bamboo trade is part of forest protection policy. The Government aims to reduce the quota because it has a long-term policy to phase out commercial harvesting of forest products in the Vientiane Capital area by 2010.

Harvesting of bamboo products in Sangthong district officially follows the quota set by the Vientiane Municipality (the Province to which Sangthong district belongs). For 2005, the quota was set to be 60,000 poles, for 2006, the quota is 50,000. Out of this, the toothpick producing company Panthavong gets 20,000 poles, the rest is sold to the traders (bamboo handicraft producers) in the Vientiane area. However, the total annual output of bamboo poles from Sangthong district could be more than the quota (60,000 poles). Referring to the report of bamboo trader group only, the calculated of exported product

volumes in 2005 would be around 370,000 poles and 62,4 Tons (please see in table 5). These volumes were supplied from Napo, Nong Boa, Taohai, Natan, Partaep, Napho, Nasa, Snod and Kokhae villages. This is 6 times the official annual quota, proposed by the Province Forestry Office of Vientiane Municipality. It is not included the bamboo culms from Kouy, Huy Tom, So, Wangma and other villages sell to Vientiane. It would seem that the quota setting process has little impact on the actual size of the bamboo production.

Table 5. Bamboo used calculation

No	Product	Size Of products	Volume sold in 2005	Poles used/mat /Ton/unit	Total bamboo used (poles, tons)
1	Wall mats are made from Mai Hia	2x3m	26,000 sheets	10	260,000
2	Bamboo mats for tobacco drying are made from Mai Hia and Mai Phaang	1.75x0.75m	52,000 sheets	2	104,000
3	Fence mats are made from Mai Phaang	1.7x1,7m	600 sheets	6	3,600
4	Chicken coops are made from Mai Phaang		600 units	3	1,800
5	Egg basket are made from Mai Hia		700 units	1	700
6	Baskets for tree seedling		100 units	1	100
7	Joss sticks are made from Mai Hia and Mai Paang		52 Tons	1.2 Tons	62.4
Grand Total		370,200 poles and 62.4 Tons			

Actual bamboo extraction from Sangthong district is at least 6 times higher than the official quota; this raises questions on the usefulness of the quota system, which would benefit from enforcing a rapid decline in bamboo marketing? What would be the best way to develop the bamboo marketing system? The reduction of the quota for trade result in reduced village income from sales reduced state income from taxes and may stimulate illegal trade. The effect of lack of scientific

evidence on sustainable harvesting of bamboo, lack of resource assessment techniques prevents authorities from satisfactory monitoring resources.

3.) Limited market information and marketing skill

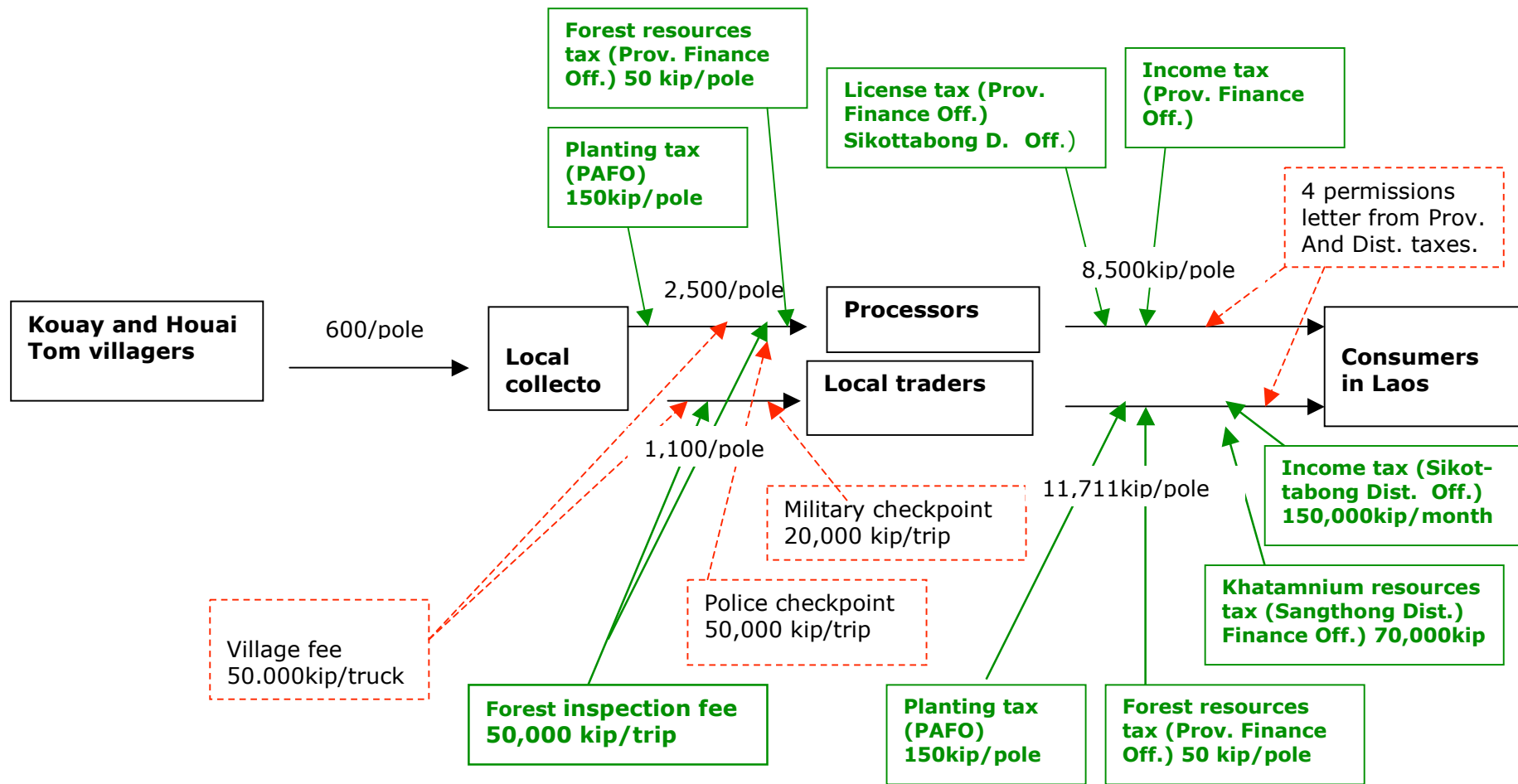
The research team found that in all the bamboo market chains, Farmers are unable to be sensitive to market and price fluctuations. Farmers get most of their market information from collectors and traders. The collectors buy bamboos when they get an order. On the other hand, the traders and processor have better access to market information and they know the cost and profits at each link of the market chain and the risks faced.

Most of traders and processor are private small businessmen, who have an experience more than five years. They are farmers and some was government staff and retired. Hence they did not any training in the trade business, but they simple learnt by experiences. Consequently, there are many weaknesses in their business practices.

5.) Multiple Taxation and other fees

Bamboo products in Sangthong are subject to a load of formal and informal taxes at district and provincial level. These include local administrative or service charges, as villages, at inspection and so on. Farmers do not pay taxes directly, but resources taxes, rehabilitation fee, village fee, value added taxes, payable by traders or processors at village, district and provincial office or other places have directly negative impact on village price. Traders are also subject to informal fees, without legal mandate; which in turn affect product prices. Most traders or collectors who transport forest product on the road or by rafting are obliged to pay fees to the official on duty at the police station or forest inspection station, regardless of whether their truck overload or not or for checking document. The collector or traders agree to pay fees to these stations as they do not want to be detained for a longer period of time, or do they wan to unload the bamboo for checking as this incurs an extra cost. The fee of each station is not large, but the truck or the rafting bamboo has to pass several check point, the cost incurred can be considerable. In really these fees are applied in most area, were they present a source of income to local authority. All these fees contribute to increases in the product price, which leads to lower competitiveness and in the end it is farmers themselves get low price. In addition to this, the fees are often collected without any receipts, raising the question of who benefits from these arrangements.

An example of multiple formal and informal taxes indicated in figure 8.



----- =informal taxes, Bold = fixed fee, with receipts

Figure 8. An example of multiple formal and informal taxes.

4.1.4. Conclusion and Recommendations

Bamboo production gains increasing importance in generating additional income for villagers. Although the income gains from this activity are second to income from other activities, it provides cash that helps cover daily expenses of a household to reduce poverty. In many villages, where the bamboo handicraft production has good experiences, villagers are very skillful. The demand from local market and Thai market for the products is relatively high. It is recommended that villagers continue this activity, since it generates rather good income for them.

From point of view of resources utilization, there are harvested with a big amount, if the resource has not been started to properly managed, it is likely to be scarce like in the case of Nasa or Kokhea village (Sangthong district). It is strongly recommended that the villagers involved are assisted with technical advice on how to sustainably use and manage bamboo.

Actual bamboo extraction from Sangthong district is 6 times higher than the official quota; this raises questions on the usefulness of the quota system, which would benefit from enforcing a rapid decline in bamboo marketing? What would be the best way to develop the bamboo marketing system?, What can farmers and traders do and what external assistance would be most useful to them, in achieving better returns for their products?. The major findings of this research can be summarized in terms of some main recommendations:

- Conduct research into the sustainable and ecological effects of extraction of bamboo in terms of culms used and for shoot use.
- The principles of sustainability and conservation should be prioritized in the government policy concerning bamboo extraction and trade.
- Develop and enforce sustainable bamboo harvesting, forest conservation and trade regulations. Bamboo resources are still sustainable and good sources of income for farmers. If the quota only has a negative effect on farmers' income. Instead of a quota, the government should promote bamboo for management for sustainable farmers' income generation.
- The quota system should be revised, should be based on data estimates of bamboo resources sustainable harvesting regimes.
- Reduce or switch from selling bamboo poles to various bamboo handicraft products such as baskets, cooked rice baskets, and so on, which can make more income. In addition to making handicrafts, should make conditions for attracting more buyers and bamboo processing industries to the Sangthong area.

- Strengthening trading group or organize producer groups by training programs in market organization for villagers, including the establishment of collectives and organized associations, aimed at empowering villagers in marketing process and the management of bamboo trade. Look for new markets: Vietnam, China are big consumers of bamboo handicraft products, develop linkages with these countries. The government should involve on the making and signing contract with the external traders.
- Reduce tax burden for traders, leading to a better share of income for primary producers and increasing business volumes.
- The government should focus on technical and marketing assistance by trainings. A marketing information dissemination system should be developed.

4.2. Bamboo Marketing in Kam and Phoukood Districts, Xiengkhouang Province

4.2.1. Study site

Three villages were selected for survey: Danethong, Ko Ngiew and Mixay villages. The criterion for village selection is presence of the bamboo products is marketed. Summary of the livelihoods and resources in three study villages indicates in table 6.

Table 6. Summary of the livelihoods and resources in three study villages

Item	Danethong	Ko Ngiew	Mixay
paddy rice	150 ha	240 ha	
Rice production	1.5 tons/ha/yr	3 tons/ha/yr	2.5 tons/ha/yr
Households Number	21	55	69
Ethnic groups	Khamu: 100%	Khamu: 100%	Phouan: 95% Khamu: 5%
Topography and vegetation	Slop and forest with large area of natural bamboo forest and mountainous with high cover forest	Lowland and slop and secondary forest.	Slop and mixed conifer and broad leaf secondary forest, and glass land.
Infrastructure	-Pave road to village, -No electricity - No school	- Poor, tertiary road to village. - No electricity -Primary school -Gravity based clean water supply, -Coverage of mobile phone network	- Poor tertiary road to village -Semi-primary school - No electricity
Main resources of household income	Rice, and fermented bamboo shoots and other NTFP	bamboo handicraft, livestock rice and NTFP	bamboo handicraft, livestock, rice and NTFP
Income from bamboo products	1,3mill kip/hh/year	1,6 mill kip/hh/ year (59% of total cash income)	5 mill kip/hh/year (50% of total cash income)

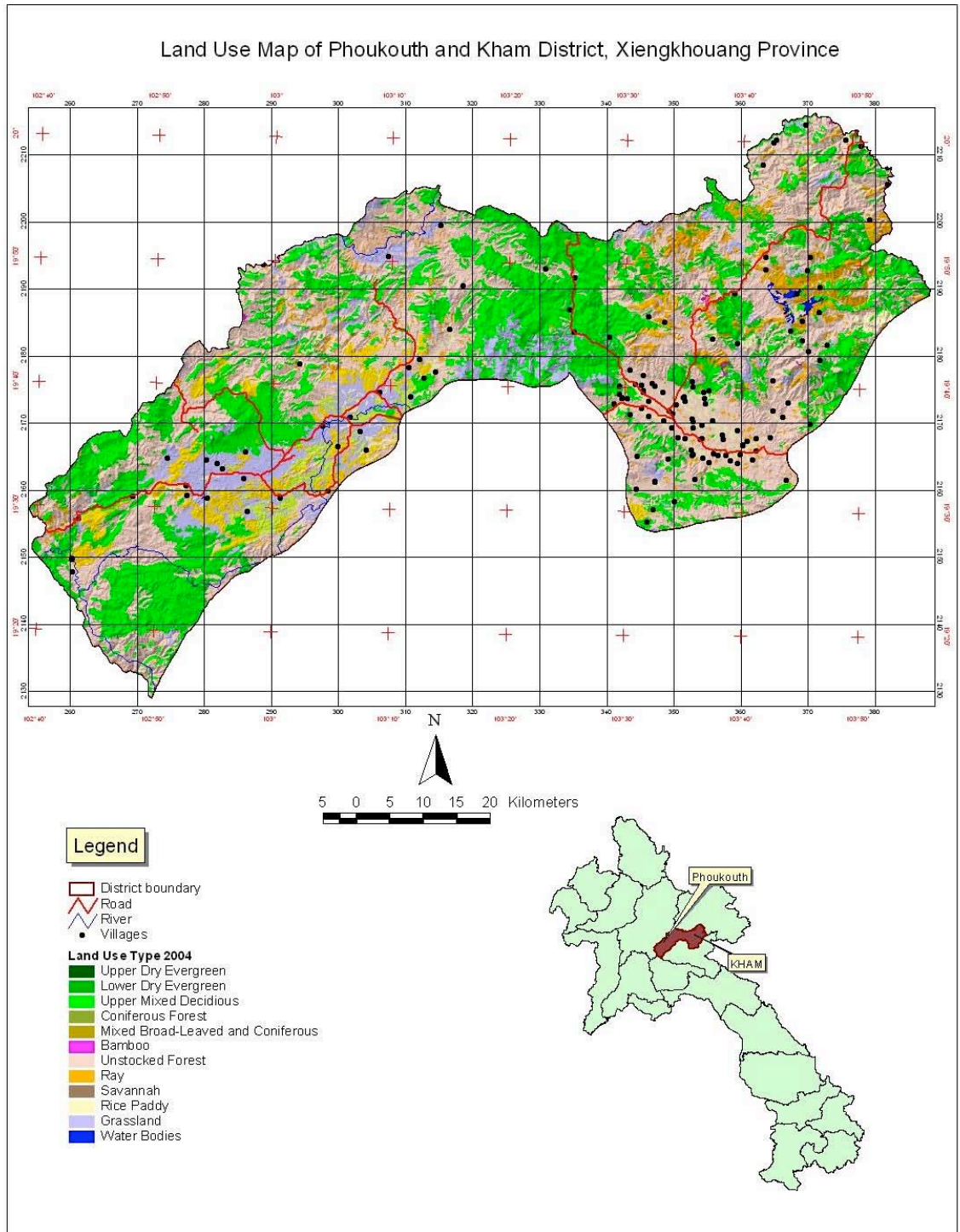


Figure 2. Land Use Map of Kham and Phoukouth Districts

4.2.2 The Market Chain and Price variation along Market Chain

Bamboo handicraft and fermented bamboo shoot are long traditional of villagers in Xiengkhuang Province. The most well-known bamboo shoot processing is Danthong village. Bamboo fermented shoots become commercialized about 5 years ago when the products meet the customers tastes. The handicraft production of bamboo-mulberry umbrella and bamboo rice cooked box are produced by Mixay and Ko Gnoe villagers respectively. The background of these villages can see in annex 2.

1) Bamboo Harvesting, Bamboo Production Volume

Fermented Bamboo Shoot:

Bamboo shoot of the Hok species are used for fermented bamboo shoots. The description of this species, please see in the box 2. Hok bamboo shoots were found mostly from June to October of the year. Danthong villagers collect bamboo shoot in the bamboo forest is about 5 km far away from the village. Bamboo shoots collecting activity is usually done after villagers finish daily work at home. They go in a group in the morning with knife and bag and come back in the afternoon with a full bag of bamboo shoot, approximately 20-30 kg per trip per person.

The bamboo shoot fermenting process includes different steps follow: Peel the hard skin of the shoots, then cut and chop bamboo shoots into small and fine pieces, put them into big plastic bags with bamboo basket, pour water into bamboo bags covering all the chopped shoots, put salts and cover with plastic. It takes 4-5 days later fermented bamboo shoot is ready for cooking.

It is estimated that in 2005, the villagers produced 3,500 baskets (one basket it need approximately 3.5 kg of bamboo shoots and 1.5 kg of water, together 5 kg per basket) or 17,500 kg of fermented bamboo shoots. This mean approximately 12,250 kg of raw bamboo shoots were cut. Figure 9 shows the market chain mapping of bamboo fermented shoots.

Ko Ngiew villagers are very skillful in cooked rice produce. Villagers collect bamboo in the forest very far 5-6 km away from the village. One trip they can collect only four culms and enough for 15 rice boxes. Cooked rice box's production process start with slicing the bamboo stripes, and then dry with sunlight. After that they are refined by using sharp knife and start weaving. In 2005, about 4,500 cooked rice boxes are sold from Ko Ngiew village.

Bamboo-mulberry umbrella is one of well known handicraft, which made from bamboo and mulberry paper. Hok species is used for making a frame of umbrella, Loi species is used for handle of umbrella making. The bamboo can be found in the forest, 10 km far away from the village. One pole can produce 10 umbrella frames. In 2005 villagers used approximately 530 poles. The source of mulberry barks is difficult to get in the village forest. It is approximately 22 kg per household.

The process of umbrella producing start with frame making by cut bamboo pole into sticks size with different length and width that will be assembled as a frame of umbrella. Then shape and refine pieces of sticks. Cut the Loi into different handle size. Drill certain part of the sticks to make whole, where different sticks then can joint together. Ten join all pieces of stick into a frame of umbrella. For cover of umbrella uses mulberry paper. Processing mulberry paper start with boil mulberry bark then breaks into fine tissue, soak the tissue in the water, then dry tissue in wooden frame size 0.4x2m, after that dry mulberry paper and cut into the size needed for making umbrellas, then glue the mulberry paper on the umbrella frame by using forest banana glue. After that dry the finish umbrella to the sun and decorate by using natural dyeing and put a small cap on the top of the umbrella. Finally polish with oil.

Villagers produce 12 different size of umbrella, measured as the length of the folded screen. There are sizes: 15 cm, 20cm, 30 cm, 35cm, 40 cm, 45 cm, 50 cm, 60 cm, 70 cm, 80 cm, 100 cm and 120 cm. The most popular ones are 30 and 40 cm.

The making umbrella becomes household activity, which involve men, women and children. The production is year round, accept the rice farm season. In all the whole village produce 5,300 pieces in 2005, this increase about 44 % if compare to 2003. Figure 9 shows the market chain mapping of bamboo handicraft from Ko Ngiew and Mixay village.

**Box 2: Bamboo description the main species in use and process in
Xiengkhouang Provinces**

Family: Poaceae/Graminea,

Subfamily: Bambusoideae

Synonym: *Bambusa monogynia* Griff.

Local names: *mai hok neaw, ko hoe.* Thai: *phai hok, mai hok, phai nual yai, mai nuan yai, phai nuan yai, waa klu.* Vietnamese: *tre da, may hoc, manh tong nua.*

Use:

One year (or less) old canes are used for tying material when split. Canes of 2 years old and more are used to make handicrafts, house frames, hand tools and furniture. The lower part of the culms, 4-5 internodes, is preferred for making ornamental articles. The shoots are edible but a little bitter.

Harvesting:

Both culms and shoots are harvested. Harvesting time is all year round for culms aged 3 years and older. Shoots are harvested mostly in the middle of raining season (July-August).

Propagation:

Hok species usually is easy propagation by culms, stump cutting and seed. Planting space can be by 3x3 m or 4x4 m.

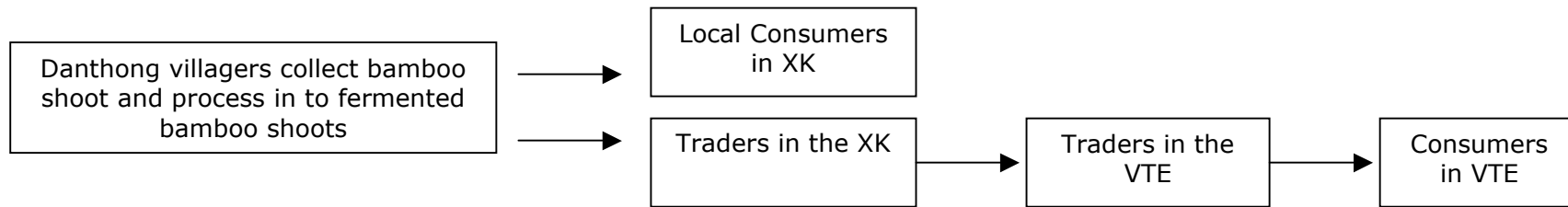
Description:

Dense cluster of culms, branched have no spines, average size of cluster is about 2-3 m and the average of high is approximately 13 m. Average diameter is 6 cm, with a wall thickness is approximately 1.5 cm, internodes 45 cm long. First branch from the ground is about 3 m high. The base of main branch is usually rooting, and suitable for propagation. The average length of leaf is 38 cm, partly hairy on the top. Numbers of leaves are 6-12, Shoots are dark reddish, covered in f dark reddish hair on the top part of the sheet.

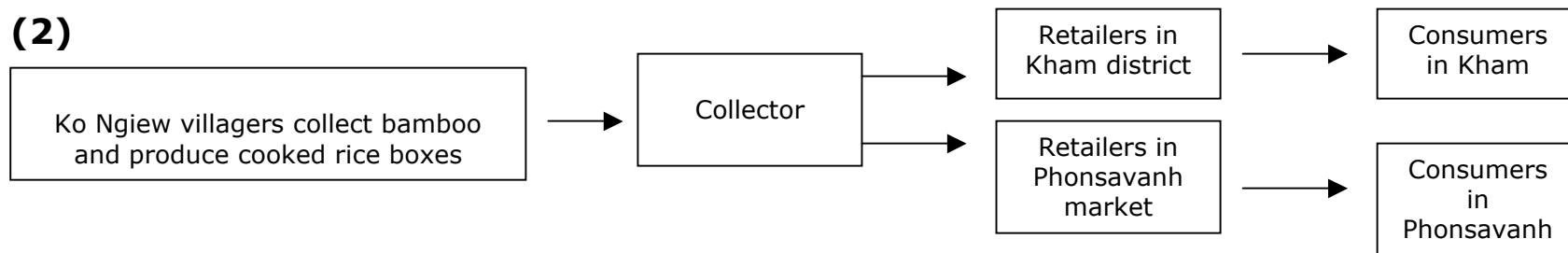
Distribution & Ecology:

This species can found along slopes of mountains in dry evergreen and mixed forest in upland areas of high humidity. The species requires cool weather and naturally grows scattered, with other bamboos like *mai sanod* and *mai hia*. Bamboos only flower and fruit once in their lives after 50 years.

1)



(2)



(3)

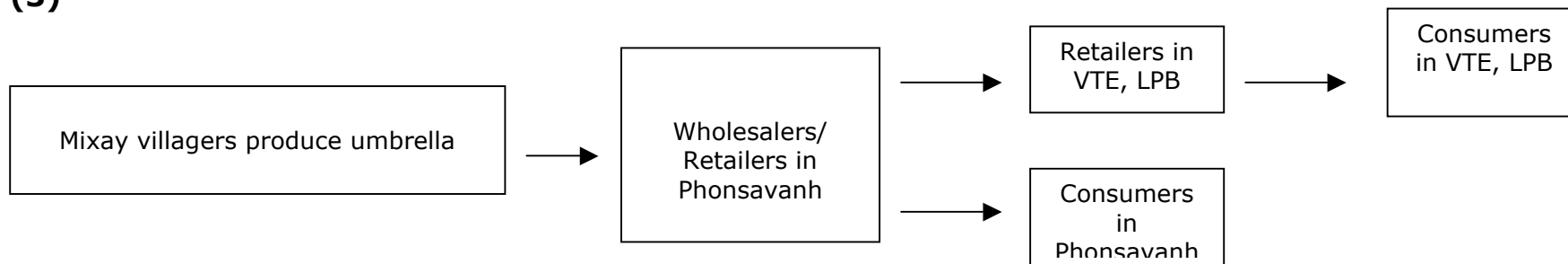


Figure 9. Market chain mapping of the bamboo fermented shoots from Danthong villages (1); cooked rice boxes from Ko Ngiew village (2) and bamboo mulberry umbrella from Mixay village (3)

2) The Market

The villagers of Danthong sell the fermented bamboo shoots mostly 90% to passenger buyers, who are local people or visitors from other provinces. 10% of fermented bamboo shoots are sold to one Phonsavanh trader, who recently made order. Phonsavanh market is where the fermented bamboo shoots are sold to local consumers and visitors from other provinces. The trader sells approximately 90% of the products to local consumers and 10% to traders from Vientiane, who are intermediaries or wholesalers/retailers in Vientiane market. Bamboo handicraft products as rice box are mostly for household consumption. The villagers sell their products to local collectors. There are one village collector and one from neighboring village. The local collectors sell the products to wholesalers/retailers in Kham district market and Phonsavanh market. Wholesalers/retailers in Kham district market and Phonsavanh market sell product to local consumers visitors in Kham and Phonsavanh market.

In case of umbrella, village producers bring their products and supply directly to the buyers in Phonsavanh town approximately 80% of the products. In Phonsavanh, there are about 8 wholesalers/retailers. Villagers travel by motorbike or public bus. The wholesalers/retailers in Xing khuang , who bough products from the village producers have their own customers and channel to sell the umbrellas. Most of their customers are retailers, who own the handicraft shop and some are the individual users. The products were sold to consumers in Louang Prabang, Vientiane city, and Savannakhet province and in 2005. The Xiengkhuang traders estimate increasing sales in the future but worry about the shortage of supplies of the village products.

3) Price Variation along the Market Chain

The village producers sell fermented bamboo shoots to traders in local market at the same prices as to individual consumers. Bamboo shoots are seasonal products and the prices vary in the year. The price is high at the beginning of bamboo shoots season (mid June to mid July) about 3,000 kip per Kg. It goes down to 1,000 kip per Kg in mid August to September. The price is high again in October. The prices are constant for two years. The traders sell in local market about 4,000 kip per Kg in high season and the prices also vary according to the season.

The price of bamboo rice box in Ko Gniew village has not change for a few years. In 2005-06 the average income form bamboo rice box

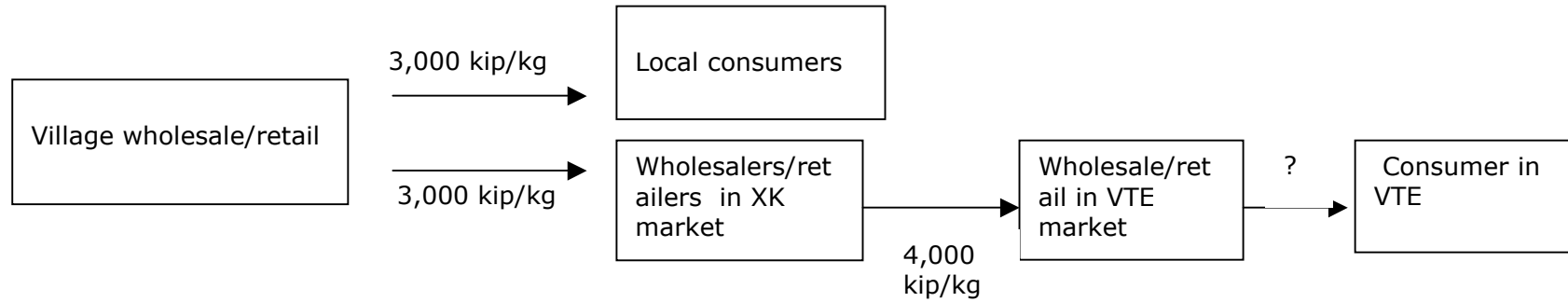
making per family is estimated to be 1.6 million kip per year or 56 % of total income. Village producers sold bamboo rice box to collectors 20,000 kip per piece. The collectors sold to retailers in Kham and Phonsavan market at the same price about 22,000-23,000 kip per piece. Retailers sold bamboo rice box to consumers at Kham and Phonsavan market about 25,000-27,000 kip per piece. The detail of prices variation of fermented bamboo shoot and bamboo cooked rice boxes are showing in Figure 10.

Concern bamboo-mulberry umbrella, the village producers sold products to traders in Xieng Khuang is not fixed. The prices of each size of umbrella can vary depending on the bargaining of producer and the buyer. The prices can vary about 1,000-2,000 kip per pieces from the set price.

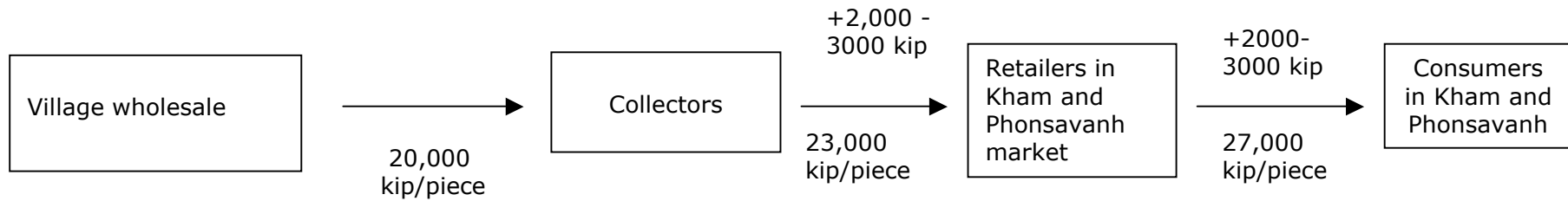
The traders who buy the products direct from the village producers sell the products to other retailer in phonsavan district or trader from other provinces. The prices of one product sell by the same seller may be different for different customers depending on the bargaining between the seller and customers. The detail of prices variation of bamboo-mulberry umbrella is showing in Figure 10.

The main business costs of traders is the cost of buying products, the traders do not have to pay any tax or fee concern to the resources or rehabilitation or village fee and other in selling handicraft products, they would pay shop rental and income tax only.

(1)



(2)



(3)

size 15= 15.000 kip/pce
 size 20= 20,000 kip/pce
 size 30=25,000 kip/pce
 size 35=30,000 kip/pce
 size 40= 35,000 kip/pce
 size 45=40,000 kip/pce
 size 50=45,000 kip/pce
 size 60=50,000-60,000 kip/pce
 size 70=75,000-80,000 kip/pce
 size 80= 100,000 kip/pce
 size 100= 120,000 kip/pce
 size 120= 280,000 kip/pce

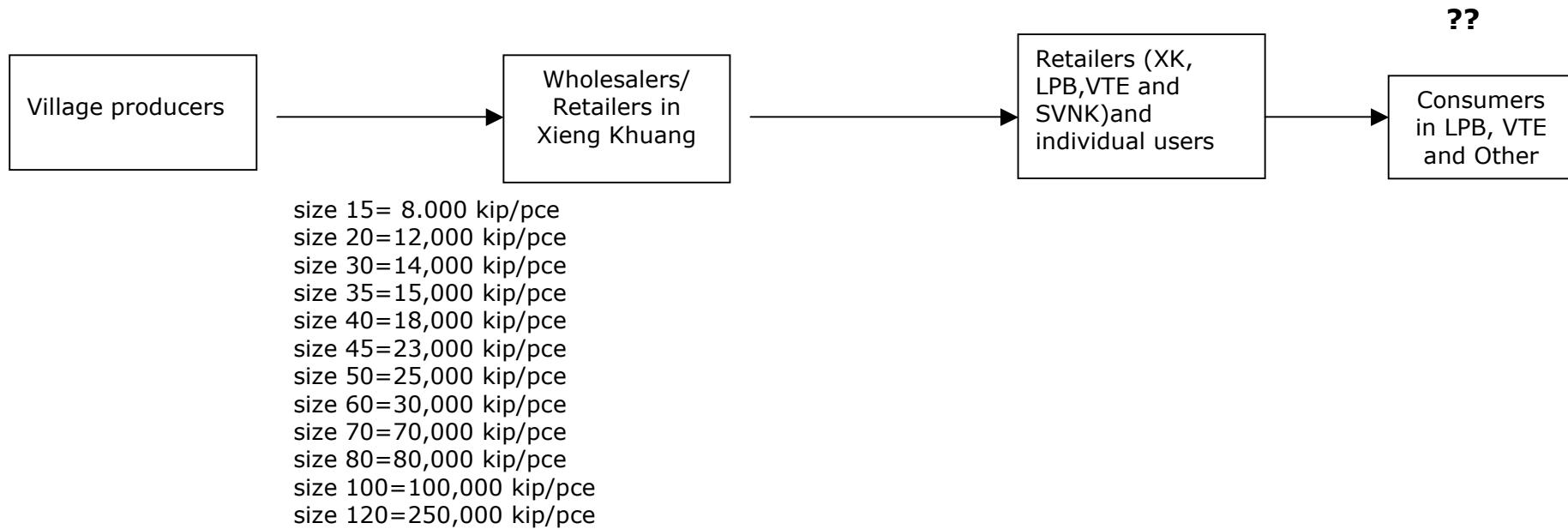


Figure 10. Value chain mapping of the bamboo fermented shoots from Dantong village (1); bamboo rice box from Ko Gniew village (2) and bamboo-mulberry umbrella from Mixay village (3)

4.2.3 Market Chain Constraint

The summary of findings on constraints in marketing bamboo products of villagers in Kham and Phukouth districts as follow:

1) Depletion of resources.

Excessive extraction and trade of bamboo can lead to depletion of bamboo resources. On the other hand the sifting cultivation and flowering of bamboo bring to deplete the bamboo resources rapidly. Depletion of bamboo resources is ecologically damaging and creates uncertain income for villagers. In the case of Ko Ngiew and Mixay Villages, in fact the Hok bamboo species can not find at around their villages, they have to go to other villages to ask the permission for cutting bamboo not less than 10 km far away from their villages.

2) Conservation awareness.

There is low level of awareness of conservation values in the management of trade in bamboo products at any level such as village, district and provincial level. Hence the bamboo product supply has decreased.

3) Limited market information and marketing skill.

In the market chain of bamboo products, the traders have a controlled position in the market chain. Villagers have little control, due to lack of marketing information and lack of marketing organization. Villagers get most of their market information from collectors and traders. The collectors buy bamboo products when they get an order from traders. The traders have better access to market information and they control the prices.

Most of traders are private small businessmen, who are farmers. Hence they did not have any training courses in the trade business, but they simple learnt by experiences. Consequently, there are many weaknesses in their business practices.

4.2.4. Conclusion and Recommendations

At the moment the total estimated annual sales of bamboo products in three villages are 17,500 kg of fermented bamboo shoots at Danthong village; 4,500, cooked rice boxes at KO Ngiew village and 5,300 bamboo-mulberry umbrellas at Mixay village.

The government agencies acknowledged that bamboo shoots and bamboo culms generate good income for the poor people. At the moment bamboo shoots or bamboo culms cutting is freely permitted. However, as long as the natural resources management is concerned, cutting of bamboo shoots, bamboo culms for commercial uses is not freely permitted by the Forestry Section and government agencies concerned. There is no specified quota for this though. The only formal instruction of the Forestry Section is not exploited immature bamboo culms. The support for bigger production of bamboo products is not certain, due to there is no evidence from the bamboo resources to justify the possibility to produce more.

What can producers and local traders do and what external assistance would be most useful to them for getting better share of the profits for their products? The key recommendation is follow:

The government should focus on technical and marketing assistance by trainings.

From point of view of resources utilization, the production uses rather big number of bamboo resource, the resources become scare that creates a problem for villagers. Villagers should be prepared to plant the bamboo. The Forestry Section should provide training program for villagers in particular technique of bamboo plantation development and management.

Interventions to support marketing of bamboo products can take place in several forms in addition to ensuring villagers receive better share of profits. Simply ensuring continuous demand in combination with improved harvesting techniques would be a step forward. But by also helping villagers to obtain better profits, they can be encouraged to look a long term sustainability management of the resources.

Any intervention supporting would be to assist the villager and collectors to form an association which sell directly to a buyer in Phonsavanh district or sell directly to retailers in other provinces. Look for new markets such as Vietnam is big consumers of bamboo products, develop linkages with this country. The local government should involve on the making and signing contract with the external traders.

Develop training to raise awareness of the responsibility of all stakeholders to priorities conservation in order for bamboo marketing to be sustainable.

A marketing information dissemination system should be developed.

References

1. Forestry Department, 2004. Land Use map in Laos. Vientiane.
2. Sangthong District Office, 2005. Annual report.
3. Department of Forestry, 1989. Bamboo Forest in Lao PDR
4. Department of Forestry, 1992. Bamboo species in Laos.

Annex 1: Bamboo marketing overview among 5 villages, two traders, two factories and DAFO staff selected sector

Note: All data in this annex are reported based on key informants in Sangthong district, cross-checked and interviews.

1. Interview with Agriculture and Forestry Office of Sangthong District

Marketing of bamboo products in Sangthong district officially follows the quota set by the Vientiane Capital Municipality (Province, which Sangthong district belongs to). For 2005, the quota was set to be 60,000 poles, for 2006, the quota is 50,000. Out of this, the toothpick producing company Panthavong gets 20,000 poles, the rest is sold to a number of smaller bamboo handicraft companies in the Vientiane area.

The Government aims to reduce the quota because it has a long-term policy to phase out commercial harvesting of forest products in the Vientiane Capital area by 2010. Secondly there has been a recent outbreak of flowering in bamboo of the type mai hia, which usually results in dying of the affected bamboo species, affected areas will need 4-5 years to recover.

The district officers admit that bamboo harvesting in the area is difficult to manage. Since 2004 they have organized bamboo selling groups in the villages of Ban Sanod and Ban Nasa. These villages are situated on the bank of the Mekong river, which forms the border with Thailand, they export bamboo handicraft products, mainly wall mats, to Thailand.

The district has set up an official border checkpoint at Ban Kok Hae on the Mekong river, where exports of these bamboo and other products to Thailand are taxed and registered. The border checkpoint is manned by district officers from the department trade, tax, agriculture/forestry and police.

District officers estimate the importance of bamboo marketing for the villagers to be a secondary source of income, their primary source of income being rice selling. District officers estimate income of the population of Sangthong district as follows:

- 1) rice and livestock selling 60%
- 2) bamboo 30%
- 3) other Non-Timber Forest Products and charcoal: 20%

Bamboo is not only sold as poles but also the edible shoots are sold. The main types of bamboo sold as poles are: mai phang (70%) and mai hia (30%). The main types of bamboo sold as edible shoots are: mai hia, mai lai and mai phang. Other types of bamboo in the area include: mai bong, mai sod, mai loh, but they are not used commercially. The table below lists bamboo species found in Sangthong district.

No	Lao Name	Latin Name	Main uses
1	Mai phang	<i>Dendrocalamus lonoifimbriatus</i>	Big mats, edible shoots
2	Mai hia	<i>Schizostachyum virgatum</i>	Mats, baskets, edible shoots
3	Mai lai	<i>Oxythenanthera albociliata</i>	Edible shoots
4	Mai sod	<i>Oxythenanthera parvifolia</i>	Baskets
5	Mai bong	<i>Bambusa tulda</i>	Baskets
6	Mai loh	<i>Dendrocalamus pendulus</i>	Baskets

Harvesting of bamboo poles is mainly done by men, harvesting of bamboo shoots is mainly done by women, children and elderly. Bamboo poles can be harvested all year round, but most harvesting is done in the rainy season because it is easy to drift them down the rivers and streams (June-October). Bamboo poles for weaving mats and baskets are mainly harvested in the dry season as villagers have more time to work on this after the rice growing season (December-April). Harvesting of bamboo shoots takes place in the early wet season (July-October).

The following rules apply to bamboo harvesting: bamboo can only be taken from village use forests, not from the protected forest. Quantities of bamboo harvested should follow the quota set by the Municipality (Province level). There is no checking of production quantities in the forest, only at the border checkpoints.

District officers feel that the area of bamboo forest is being reduced rapidly, mainly to due converting forests to gardens, over-harvesting, natural flowering etc.

The bamboo which is sold as poles is tied in floating rafts of about 1000-3000 poles. If bamboo is exported by car, one car can carry about 700-800 poles. The farm-gate price of bamboo poles in late

2005 was 500 kip per pole for mai phang and 200 kip per pole for mai hia.

The district levies a tax called "burana sabphayakon pamai" also known as "pantha pasi" of 50 kip per pole, irrespective of the type of bamboo.

2. Bamboo producers in Ban Napho village

Ban Napho consists of 86 families, 425 inhabitants, of which 216 women. The inhabitants consist of Lao Loum and Lao Theung ethnic groups. Their main occupation is rice farming (50%), secondly they get income from livestock raising (30%) and production of bamboo products (20%). All 86 families are engaged in bamboo weaving in the dry season. On average, the whole village uses 10,000 to 15,000 poles per year to make bamboo wall mats, bamboo roof tiles, baskets and other handicraft products (see table below).

No	Product	Size	No of poles used	Type of bamboo used	Amount/family/yr	Price per piece
1	Bamboo wall mats "kateh tak ya soup" for making tobacco drying sheds	70x170cm	1-2 poles for one mat	Mai hia	300	5 baht or 1,300 kip
2	Bamboo wall mats "kateh lay song" for house construction	200x300cm	10-15 poles for one mat	Mai hia	300	50 baht or 13,000 kip
3	Bamboo roof tiles "mai fa mounghuan"	20X60cm	10 tiles per pole	Mai hia	variable	300 kip
4	Bamboo mats for fencing gardens "kateh om souan"	120X170cm		Mai phang, mai sod	variable	5,000 kip

Commercial bamboo handicraft production started in 1999 when a German project constructed a road to the village, making it possible to

send out bamboo mats by car. The village collects a local tax of 50,000 kip per car load of bamboo from outside traders. One car (handheld two-wheel tractor) can carry around 15 big bamboo mats, so the tax rate is around 3,000 kip per mat of 13,000 kip.

All of the bamboo is collected within a radius of less than 1 km around the village. One man can cut around 100 stems per day. He can carry up to 3 poles of mai phang on his shoulders or 5-6 poles of mai hia each time. The area under bamboo seems to be getting lower. Only stems older than two years can be used. Villagers get 500 kip per pole of mai phang and 300 kip per pole of mai hia.

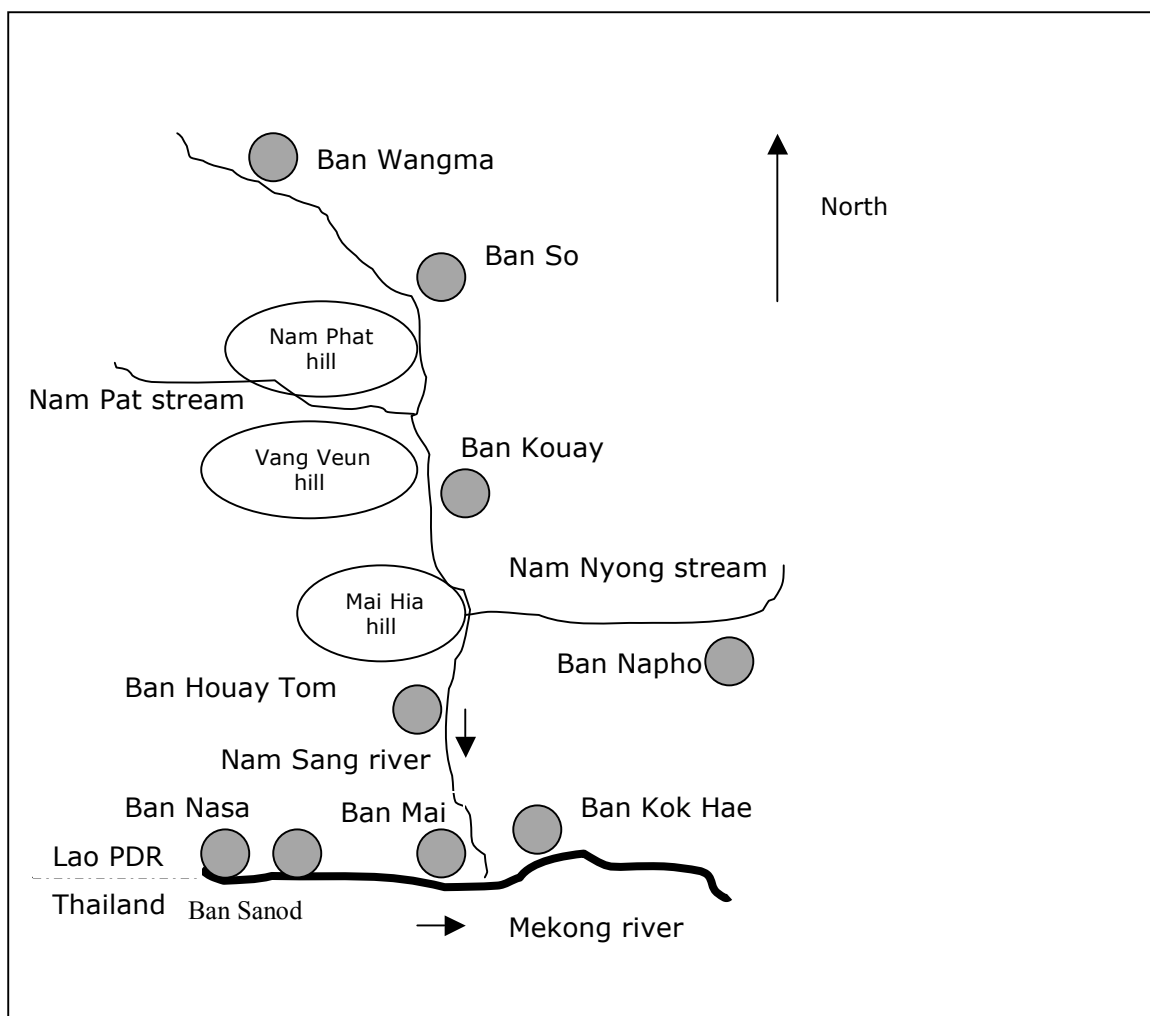
3. Bamboo collectors in Ban Kouay village

There are 107 families, 557 persons, in the village of Ban Kouay, belonging to both Lao Loum and Lao Theung ethnic group. Their primary occupation is rice farming (both upland and lowland), secondary are livestock raising and bamboo harvesting. Around 45 families sell bamboo; all families are engaged in cutting bamboo.

The main species of bamboo that occur in this village are: mai phang, mai hia, mai sod, mai lai, mai loh. Of these, only mai phang and mai hia are sold as poles, mai sod and mai loh are used to make baskets. The main bamboo harvesting areas are: (1) vang veun (2) pou mai hia and (3) nam phat (see sketch map in figure 11).

Per year, the village of Ban Kouay uses more than 20,000 poles of bamboo, of which around 80% are sold. Most of the poles are sold without processing (see table below).

No	Product	Price in village	Price Vientiane	Transport	Village tax
1	Poles of mai phang	700 kip	1,300 kip	90% by water (rafting), 10 % by car	50 kip per pole
2	Poles of mai hia	500 kip	900 kip	same	50 kip per pole
3	Wall mats (2x3m)	8,000 kip	13,000 kip	100% by car	



Sketch Map of Ban Kouay and surrounding bamboo producing villages and its three bamboo collection areas around the Nam Sang river.

Most of the poles are transported by rafting them down the river, in the rainy season it takes 2 days to reach Vientiane city, in the dry season 4 days. In the rainy season, one raft can have up to 500 poles, in the dry season only 100-150 (to get down the shallow Nam Sang river to the Mekong River and flown down the river in big rafts of 700-800 poles each. It takes about 2 hours to tie one big raft together, half an hour for a small raft. If transported by car, one car can take 800 poles of mai phang or 900 poles of mai hia. The price of transport by car is 700,000 kip from the village to Vientiane city, additionally 50,000 kip will have to be paid to the Sangthong district as tax, "burana" and 50,000 kip to the Sikodtabong district. Inside Vientiane, typical destinations such as Ponthong, Dong Palep cost an additional 1050 kip per pole in transport cost by car.

The size of bamboo required by the market is 5 cm in diameter; the bamboo should be older than 2 years. One man can cut 50 poles per day, the average distance from the village to the harvesting area is 200 m.

Because this village is higher up the road from Bam Napo, they do not get many requests to produce bamboo mats, they can sell only bamboo poles.

4. Bamboo producers in Ban Houay Tom

The head village of Ban Houay Tom is reported to be the largest bamboo producing village. All of the 64 families or 370 inhabitants belong to the Lao Theung ethnic group. They mostly produce upland rice, which is mainly used in the village, not sold. Only one third of the 64 families can produce enough to eat. There are 4 bamboo traders in this village; all families are engaged in bamboo harvesting. The village sells around 70,000 poles per year. One person can cut and harvest around 50 poles per day. Most bamboo is sold as poles, flown down the river in big rafts of 2,000-3,000 poles each. The village made a rule to collect 100 kip per pole as village tax, but this rule was never really implemented. When they go down the river they spend money for fuel for motorboats to drag their bamboo down the river, around 150,000 kip per raft. The main destination is the river port of Khao Liao, around 55 KM downstream from Ban Houay Tom, 5 KM before Vientiane city, additionally 50,000 kip will have to be paid to the Sangthong district as tax, "burana" and 20,000 kip to the military check point.

5. Bamboo buyers in Ban Sanod and Ban Kok Hae

Ban Sanod lies at the bank of the Mekong river, people here sell bamboo products from villages like Ban Napo and sell them to Thailand. The village has around 557 inhabitants, around 90 families. Their primary activity is producing and selling rice, bamboo selling and handicraft making is a secondary income earning activity. The price of big bamboo wall mats "kateh" is 13,000 kip, they are sold in Thailand for 90 Baht. The main sources of bamboo are Ban Napo, Ban Nasa and Ban Huay Tom, Ban Taw Hay, Nasa....

They used to sell freely, now they have been told by the district to sell their bamboo products as a group. The district collects tax "burana" from these groups of 10 Baht (2,600 kip) per wall mat, of which 0.2 Baht are supposed to be returned to the two villages each.

When the bamboo is transported to Thailand, it costs 2 baht per wall mat to ship the products across the Mekong River (1 baht for the boat and 1 baht for the laborers).

The bamboo selling group now exists 4 years already. Since two years the new rule has been enforced by the district to collect tax as described above. They deal with Thai traders. There are five members in the group: 3 in Ban Sanod and 2 in ban Kok Hae. Although they are called a group, they sell their products individually. They report their results every month to the village and district leadership. Most of the demand for bamboo products from the Thai traders falls from January to April and from September to October. The main Thai trader is: Mr. Loy, Ban Mouang, Amphur Thabo, Nongkhai Province, tel. 010-499484 (Thai), 020 245425 (Lao).

The main problem in the trade is that the Thai traders are always in debt, usually it takes 1-2 months to get paid until after delivery of the products. The products go to various Thai provinces such as Udon Thani, Sakhon Nakhon, Khon Kaen, Korat (Nakon Ratchasima), some even reach as far as Chiang Mai.

The table below summarizes prices, taxes and other costs for various bamboo products provided by the bamboo traders group:

No	Product	Size	Poles used	Buying price, kip	Selling price, kip	Boat cost, kip	Labor loading, kip	Tax, kip	Profit, kip
1	Wall mats	2x3m	10	13,000	23,000	2,600	2,600	2,600	2,600
		1.5x3m	8	10,400	15,600	1,300	1,300	1,300	1,300
		2x2m	7	9,100	14,300	1,300	1,300	1,300	1,300
		1.75x0.75m	2	1,300	2,340	260	260	260	260
		2x4m	14	20,000	31,200	2,600	2,600	2,600	5,400
2	Fence mats	1.7x1,7m	6	2,080	4680	780	780	260	780
3	Chicken coops		3	7,800	10,400	520	260	260	1,560
4	Small chicken coops		1	7,280	9,100	250	260	260	1,040
5	Egg basket		1	1,170	1,560	130	130	30	100
6	Joss sticks		1	1,300	7,820	25	25	130	390

6. The border checkpoint of Dan Kok Hae

At the border checkpoint of Dan Kok Hae there are district officers from the departments of trade, tax, agriculture/forestry and police. Anybody who wants to ship bamboo products to Thailand needs to pay export tax, "akhone", according to a list tariffs displayed at the checkpoint office (see table below). This export tax comes on top of the other tax already paid earlier by traders to the district, the so called "burana" (see sections 4, 5, 6 and 8 above).

Export prices and export tax levels for various products, as published at the border checkpoint of Dan Kok Hae, January 2006.

No	Product	Price per piece in Thailand	District export tax
1	Bamboo wall mats 2x3 m.	80 Baht	10 Baht
2	Bamboo wall mats 1.5x3m.	55 Baht	5 Baht
3	Bamboo wall mats 2x2m.	50 Baht	5 Baht
4	Bamboo wall mats 1.2x2.4m.	40 Baht	1 Baht
5	Bamboo fences 1.75x0.75m.	8 Baht	1 Baht
6	Bamboo fences 1.75x1.75m.	12 Baht	1 Baht
7	Big chicken coops soum kai	40 Baht	1 Baht
8	Small chicken coops	27 Baht	1 Baht
9	Kheng hai ?	30 Baht	1 Baht
10	Small egg baskets	60 Baht	1 Baht
11	Small chicken baskets	27 Baht	1 Baht
12	Rice baskets	30 Baht	1 Baht
13	Joss sticks	6 Baht/kg	0.50 Baht/kg

The most commonly exported products are bamboo wall mats of various size, bamboo chicken coops, small bamboo chicken holding baskets, joss (incense) sticks, black beans, sesame, raw para rubber. Usually bamboo products pass twice a week, on Tuesday and Thursday.

At the border, a district officer gave more information on the actual size of bamboo production in Sangthong district. Of a total of 35 villages in the district, 9 villages are involved in commercial production of bamboo. These 9 villages are all concentrated in a narrow zone around the Nam Sang River. The table below shows the ranking of these 9 villages according to size of the production. A rough estimate of the annual production for each village was made based on the estimates given in the three villages interviewed.

The total annual output of bamboo poles from Sangthong district could be around 174,000 poles, this is 3 times the official annual quota, proposed by the Province Forestry Office of Vientiane Capital Municipality. It would seem that the quota setting process has little impact on the actual size of the bamboo production. With an average price of 600 kip per pole, the income accrued by villagers would be at least 104,400,000 kip or \$10,440. This is not counting the additional income from transforming poles into bamboo handicraft products.

List of bamboo producing villages in Sangthong district, ranked in order of size of production (highest on top), source: district officer's personal observation, 2006.

Rank	Village	No of families	Estimated annual cut of bamboo poles (*from interviews, others deducted from ranking)
1	Ban Houay Tom	64	70,000*
2	Ban Kouay	107	20,000*
3	Ban So		18,000
4	Ban Wangma		16,000
5	Ban Napho	86	14,000*
6	Ban Mai Pak Sang		12,000
7	Ban Houay La		10,000
8	Ban Houay Hang		8,000
9	Ban Sanod	90	6,000
	TOTAL		174,000 poles per year
	Official annual quota		50,000

7. Province Forestry Office, Vientiane Capital City

Mr. Salieng Viengphasy (mob. 020-5512265, office: 021 480504) is the Chief of the Province Forestry Office of Vientiane Capital City, which is the equivalent of a Province. He explained that the main harvesting areas for bamboo in this province are Sangthong and Naxaythong districts. According to his statistics, around 220,000 poles were harvested commercially there in 2004. However, the Province wants to phase out all commercial forest use, logging has already been banned and bamboo cutting should also be phased out. The quota issued for 2005 was only 100,000 poles, for 2006 it will be only 50,000 poles.

Three companies are given bamboo quota:

- (1) the KPS Chinese Praying Paper Factory, Naxaythong,
- (2) the Panthavong toothpick company
- (3) a larger group of small handicraft producers

Besides these there are also two bamboo shoots canning factories, one in Vientiane Province (the next door Province) and one in Don Noune, in the town of Vientiane.

Home use of bamboos by villagers is not forbidden and is not policed. The planting of bamboo is encouraged, there are tax exemptions for people who plant bamboo gardens. There are no data on the number or acreage of bamboo gardens.

8. Panthavong Bamboo Factory, Khaoliao

Mr. Hong Panthavong (tel. 021-312348, Ban Nonekilek, P.O.Box 1436, Vientiane) established a bamboo processing factory in 1995. The factory is locally known as the toothpick company, however toothpicks are only a side product (30%). The main products are skewer-sticks, "mai siep" (20%) and "mai kaling" (50%) for barbecuing and for ice-cream.

The factory uses around 20,000 poles per year, the main type of bamboo used is mai phang, and other types are not suitable because the stem is not thick enough. They buy stems with a minimum diameter of 6-7 cm, or the size of a Lao beer can. The company buys poles of mai phang at a price of 2,500 kip per pole. Most stems are bought in the dry season, they are dried in a special oven before using in the factory. One pole gives about 1 kg of final products.

Mr. Hong estimates that his products cover about 70% of the domestic market in Laos. The rest comes from Thai and Vietnamese producers. The main users are restaurants and ice-cream sellers.

The factory has specialized equipment which was imported second-hand from Thailand. The spare parts are easy to get and the machines are easy to maintain.

The company employs around 20 persons in the dry season, only 7 in the wet season. They sell around 20,000 kg of final products per year, at an average price of 0.5\$ per kg, total turnover is \$10,000 per year. The main production costs are raw bamboo (20,000 x \$0.20= \$4,000) and labor, around \$5,000 per year.

It is difficult to expand the production for export, as quality standards are very high and the product is difficult to store for longer periods. To get to export level, the company would have to invest in higher quality machinery, which would allow a more uniform product quality. If this machinery would be available, it would be better to produce chopsticks for the Chinese and Japanese markets. For the European markets, it would seem more interesting to go for bamboo flooring products.

9. KPS Chinese Praying Paper Factory, Naxaythong

This factory is located just outside the village of Ban Ilay Tai, Naxaythong district, Vientiane municipality. The manager is Mr. Sichan Phonesavanh (Tel. 020 7707446). It is quite a large factory where 150 people work in three shifts, 24 hours per day. The factory produces a special type of bamboo paper which is used as praying paper by Chinese people. The factory consumes around 15 tons of bamboo per day (5,475 tons or around 1,500,000 poles per year), which is good for about 2,500 tons of paper per year. All the produce is exported to Taiwan. The company is Lao-owned, all the machinery was imported from Taiwan. The factory has been operating since 2000. The company could not mention the selling price of the paper in Taiwan.

Any type of bamboo can be used, mai hok, mai hia, mai phang, mai bong, mai saang phai, mai phai ban etc. The most commonly used types are mai hok and mai phang. For mai sod, 1 pole weighs around 3 kg, for mai phang around 10 kg. The buying price is 120 kip/kg no distinction is made for the type of bamboo. The total value of raw material bought by the company is therefore around \$65,750 per year (\$1 = ± 10,000 kip).

Only 90 families sell bamboo to the factory, which they all cut themselves. They would seem to get an average annual income of \$730 per year (\$65,750/90). The bamboo is all collected from seven villages surrounding the factory: Ban Phonmouang, Ban Nakha, Ban Phonekham, Ban Houy Nam Yen, Ban Nathone, Ban Tham and Ban Ilay.

In some villages, the intensive harvesting has reduced the availability of natural bamboo resources, e.g. in Ban Ilay they used to get around 20 carloads per day in 2000, in 2006 can only deliver 12 carloads per day. Yet this limited area of seven villages has been able to produce consistently around 15 tons per day ever since 2000. The bamboo is delivered by two-wheel hand tractor with two-wheel cart. On average, the factory accepts around 53 carloads per day. One carload may weigh around 750 kg.

The production process has the following steps:

- (1) weighing, buying and storing raw bamboo
- (2) chopping bamboo into small pieces with a cutting machine
- (3) soaking chopped bamboo in caustic soda for about 3 days
- (4) washing soaked bamboo, milling into pulp
- (5) pulping with water, feeding into the paper making machine chain
- (6) the paper machine chain takes up pulp, spreads it and dries it by heating, ready to use paper comes out at the other end
- (7) stamping gold colouring on the paper
- (8) cutting paper into small square pieces
- (9) bundling and packaging small papers into blocks, ready for export

Most of the labour goes into the cutting, bundling and packaging.

The main problems faced by the factory are:

- (1) high costs of transport
- (2) low skills level of workforce
- (3) waste water polluting the local streams

All of the paper has to pass through Thailand where it is shipped from Bangkok to Taiwan. With the current high oil price, the transport costs is too expensive. Going through Vietnam might reduce the road distance, but time of delivery is more reliable in Bangkok than in Vietnamese harbors, therefore the company continues to deliver via Bangkok.

Most of the workforce is recruited from poor areas in the north of Lao PDR, they consist of ethnic minorities from Luang Prabang and Xieng Khouang province. It is difficult to teach them how to work according to high standards due to their poor education levels.

One other problem that is difficult to solve for the company is the production of waste water. The waste water is quite toxic, it is now spilled in to some waste land next to the factory from where it spills into the local stream, killing all living things in the water. The water cannot be used for drinking or bathing. There have been complaints from the neighboring inhabitants; however the company says it cannot

afford the investment for a water treatment plant. The cost of a water treatment plant is estimated to be around 1 million Thai baht (around \$25,000). This compares to the total annual cost of bamboo raw material bought from the villagers of around \$65,000.

10. Bamboo trader, Khaoliao

Mr. Chansi Phanyasin (tel. 030 5257390, mobile: 020 2200546) is a local bamboo trader in Ban Dam Kham, next to the Khaoliao port at the Mekong river, at the western edge of Vientiane city. He was frequently mentioned by traders in Sangthong district as a key buyer of bamboo poles, floated as rafts down the Mekong river. Mr. Chansi confirmed that he buys bamboo from Sangthong district, at a rate of around 35,000 poles per year. The main types of bamboo bought are mai phang (around 15,000 stems per year, price: 1,300 kip per pole) and mai hia (around 10,000 stems per year, price: 900 kip per pole).

Mr. Chansi explained the complicated tax procedures involved:

- (1) "burana", tax to province finance office, 50 kip/pole
- (2) "planting fee", tax to province forestry office, 150 kip/pole
- (3) "kha tham niam" tax to Sangthong district, 70 kip/ pole
- (4) "akone tulakit" income tax to Sikhotabong district where he lives, 150,000 kip per month.

The table below shows that all these taxes add up to about 21% of the total costs for buying bamboo.

Table of costs for a bamboo buyer in Vientiane, February 2006

Cost	No poles	Price	Total cost	%
1) Buying bamboo				
mai phang	15,000	1,300	19,500,000	40%
mai hia	20,000	900	18,000,000	39%
Total buying bamboo			37,500,000	79%
2) burana tax	35,000	50	1,750,000	3%
3) planting tax	35,000	150	5,250,000	10%
4) kha tamnian	35,000	70	2,450,000	4.5%
5) akone khamlai	12 months	150,000	1,800,000	3.5%
Total taxes			11,250,000	21%
Grand Total			48,750,000	100%

The trader buy bamboo and process in to handicraft products including Mats to fence garden, wall mats, curtains and vegetable baskets then sell directly to consumers in Vientiane.

Annex 2: Bamboo marketing overview for 3 villages, in Kam and Phoukouth Districts, Xiengkhouang Province

1. "Kathipkao" bamboo cooked rice boxes Ban Kho Ngieo, Kham district

This village specializes in the production of "kathip" bamboo rice baskets. There are 55 families in this village, 313 persons, who all belong to the Khamu ethnic group. The village was established in 1950. They have 19 ha of paddy land, not enough rice to feed the village all year round. About half of the families have a paddy field; the other half relies on upland rice production. The village has a gravity-based clean water supply system; road access and coverage of mobile phone network, there are 11 hand-held two-wheel tractors.

The average income per family is estimated to be around 3 million kip per year; the richest families can get around 6-7 million kip/year. The most important source of cash income is from producing bamboo baskets, this activity was started around 3-4 years ago. The average income form basket making per family is estimated to be 1.6 million kip per year or 56 % of average family cash income (see table below).

Table: Main cash income sources of Ban Kho Ngieo, villagers estimates, 2005.

Income source	Quantity	Price (kip)	Total income (kip)	Income per family (kip)	%
Bamboo baskets	4,500 piece	20,000	90,000,000	1,636,364	56%
Maize selling	27,000 kg	1,000	27,000,000	490,909	17%
Rice selling	17,000 kg	1,500	25,500,000	463,636	16%
Chilli peppers	1,100 kg	9,500	10,450,000	190,000	6%
Peanuts	1,300 kg	5,000	6,500,000	118,182	5%
TOTAL			159,450,000	2,899,091	100%

The type of bamboo used is “mai hok”, it cannot be found in the village. The villagers have to get it from neighboring villages. Usually they take a two-wheel tractor with a cart and collect the bamboo themselves; this costs around 25,000 kip per trip for the fuel. They go just a few times per year, one car-load can take around 500 stems. Mai hok is preferred for basket-making as it has long internodes. Four poles can make around 15 baskets. To make 4,500 baskets, they need about 1,200 poles.

The main buyers of the baskets are Ms Pet in Ban Kong Neung and Mae Phim in the district capital. The market is stable as “kathip” baskets are used by most Lao families daily to keep their cooked glutinous rice in.

2. Bamboo umbrellas in Ban Mixay, Phoukoud district

There are 69 households, of which 44 are involved in making traditional bamboo umbrellas. They started in 1997 with 5 families. There are different sizes, measured as the length of the folded screen (see table below).

Size of Umbrella (cm)	Selling price in Villagers(kip)
15	8,000
20	12,000
30	14,000
35	15,000
40	18,000
45	23,000
50	25,000
60	30,000
70	70,000
80	80,000
100	100,000
120	250,000

The sales are increasing rapidly. In 2003, they produced around 2,000 pieces, in 2004, 3,500 pieces, in 2005, 5,300 pieces. The types of bamboo used are mai phang and mai hok. Posa paper is used for the cover, cotton for tying, glue is made from banana flowers and pork fat is used for making the umbrella watertight. Mostly the bamboo frames are produced by the men, the women and children attach the covers. The posa paper is made in the village by pulping the bark of “sa” trees (*Broussonetia papyrifera*). The most commonly used bamboo species are mai hok, mai sang phai, mai louang.

Material	Quantity	Can make
Bamboo	1 stem	10 umbrellas
Posa paper	1 sheet (200x40cm)	1 umbrella (40cm)
Cotton thread	100 gram	30 umbrellas
Pork fat	1 kg	15 umbrellas

Most of the produce is sold in Phonesavanh city, the capital of the province. Some of it is also sold in the neighboring province of Luang Prabang. The best selling season is the dry season, from October to May.

On average, family cash income varies from 5 million kip per year for the poorest families to 12 million per year for the richest ones. Most income is raised from livestock raising, umbrella making is considered the second most important source of cash income. Other income sources are selling rice and selling other NTFPs.

Annex 3. Summary of constrains and recommendations, and the opportunities to develop bamboo marketing identified in workshop

The summary of constrains and recommendations identified in the workshop are present below:

Procedure for getting permission to buy is too complicated (costly and time consuming), which impact negative on marketing of the product.

- Simplify and shorten procedure

Lack of market information, price is too low.

- Local authorities could assist in marketing product and provide and provide market information to producers.

Many fee collections.

- Reduce the number of fee collections.

Bamboo harvesting is not sustainable.

- Should stop over exploitation of bamboo.

What are ppportunities to develop bamboo marketing:

- Organize and extend the villagers who produce, collect bamboo in group as group collectors, processor and seller, elec.

- Supporting bamboo information by district staff, agreement and setup the bamboo products price as the same in group (getting higher price).
- Looking more markets: Vietnam and China, helping by District and village leaders.

How to increase bamboo income, who could be involved and what roles?

- Should selling bamboo in processed, not in pole (raw material)
- District trading and commercial office should organize a meeting between bamboo group producer, collectors and bamboo traders to discuss agreement, contracting for a better and sustainable price.
- The producers should be trained for better quality products.

How to manage for a sustainable harvesting and using?

- Should be research/ survey for the bamboo growing rate, pole per hectare, writing report.
- Re land use planning, allocate bamboo zone pole, shoot using as select cutting
- Forming/ setting village harvesting regulation approved by the District Agriculture and Forestry, District governor.
- Forestry staff should check the harvesting at the field, not only at the checking point.