

Bamboo production and trade in Cho Don, Vietnam

An Van Bay

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Non-Timber Forest Products Research Centre, Hanoi, Vietnam

Introduction

There are over 75 genera and 1,250 species of bamboo in the world. They are found in tropical to mild temperate regions, with the heaviest concentration of species in East and Southeast Asia (Salter, 2000). They are one of the most important non-timber forest products, providing food, raw material, and shelter for a good part of the world's population. They continue to hold an important place in the rural economy of developing countries (ICDF/ROC, 2000). Using modern technology, Asia is now producing strong plywood, composite beams laminated from strips of high strength bamboo, and elegant, precision-made floorboards. Thus, while it still holds a key place in the livelihoods of poor people, it is also a feature of our modern technological world. A large part of India's paper is made from bamboo fibre, which can produce a stronger, higher-quality paper than wood pulp (Cusack, 1997).

Being fast growing, bamboo has much potential for income generation and is important in the subsistence economy. In Vietnam the seeds are eaten as grain, and the cooked young shoots of some bamboo are eaten as vegetables. The raw leaves have been used to make high quality paper. The jointed stems of bamboo have perhaps the most numerous uses: the largest stems supply planks for houses and rafts, while both large and small stems are lashed together to form scaffolding at building construction sites. The stems are also split and used to make buckets. The smaller stems are used in furniture and for fishing poles, stakes, and other utensils.

Bamboo is found throughout the whole country, covering nearly a million hectares, or 17% of the natural forest area. There are estimated to be 3,9 billion culms. Forest cover in Vietnam declined from 43% of the land area in 1943 to 26% in 1993 (Warfvinge, 1998). Thereafter it is believed to have increased to 33% of land area by 2000 (MARD, Feb. 2001). In the last decade, Vietnam's forestry legislation and administration system has been rapidly evolving. Before 1991, forest management was through a top-down system with the state controlling all aspects of marketing including that of non-timber forest products (NTFPs). Recently restrictions on trade have been dropped and various incentives to increase forest production have been introduced.

Study Area

The focus of this study is Cho Don District in the northern of part Bac Kan Province. It is the largest bamboo raw material production area in the province. The district is 90,770 ha, with a bamboo area of 23,714 ha. Bac Kan is 150 km from Hanoi in the North of Vietnam. The province extends over 479,554 hectares, and is on the transportation route to China. Cho Don district is well known for its diverse landforms and broken topography, being deeply dissected by rivers. The area has a monsoon tropical climate with two seasons: a hot and humid reason and a dry and cold reason. Cho Don has nearly 2000 mm mean annual rainfall.

The total population of Cho Don is 46,000 people, with a density of about 50 people per square kilometer. 76% of the district is of the Tay ethnic group. Population growth is about 3%. Population has increased because of in-migration from the low lands, and from the border area of Vietnam near China.

The Resource

In Cho Don there are 62,177 ha forest and swidden fallow land, the forest area mainly being regenerated forest. Some of it is plantation, established through government support. 9 million culms are found in plantation forest, 27.5 million in production forest, while 1 million is in protection forest.

In Bac Kan pure bamboo forests with high yields are found below 700m altitude (Phan Thanh Tinh, 1997). Bamboo production is mostly done on private property (60%), on land for which producers have a red book or have customary tenure. There is also harvesting on State land (35%) and on forestland of the commune (5%). State land includes Ba Be National Park and forestland of the State Forest Enterprise.

There are many species of bamboo growing in Bac Kan. By far the most dominant species of bamboo are Truc

(*Phyllostachys pubescens*) and Nua (*Neohouzeaua dullooa*) (Table 1). Nua accounts for more than 60% of all bamboo produced in the province. *Neohouzeaua dullooa* currently grow in the forests of many villages. Bamboo has also been planted along the field boundaries as block plantations. Nua exhibits very strong regeneration and continues to reproduce naturally (Table 2). Nua blossoms and then dies en-mass. This is known as the "Khuy" phenomena. Over the next few years new young plants start to appear from the seeds dispersed following the blossoming. This phenomenon is unpredictable, and happens once the bamboo reaches an age of 30-35 years. The time from germination to reproductive maturity is 7 to 10 years.

Table 1. Common species of bamboo in Bac Kan Province, Vietnam.

Local name	Species	Characteristics	Typical uses
Nua	<i>Neohouzeaua dullooa</i> (Gamble) A. Cams	Medium sized bamboo, straight culm, good bamboo shoots	Paper pulp, functional baskets, handicrafts, light construction, mats, beds, bamboo shoots
Mai	<i>Dendrocalamus latifollus</i> Munro	Long straight culm that is very strong. Highly valued bamboo shoots	Construction, paper, functional baskets, composite boards, handicrafts, bamboo shoots, ladders, chopstick, mats
Truc sao	<i>Phyllostachys pubescens</i> Mazel ex H. de Lehaie	Medium sized bamboo, straight culm good bamboo shoots	Functional baskets, handicrafts, light construction, mats, beds, bamboo shoots, chop stick, mats, paper, fishing poles
Vau	<i>Arundinaria spathiflora</i> Trin	Large straight culms that are pliable. Shoots are good.	Functional baskets, handicrafts, fishing roads, bamboo shoots.

Table 2. Yield per ha of Nua bamboo in Cho Don District, Bac Kan Province

Products	Yield minimum	Yield maximum	Yield average
Bamboo shoots	2650 shoots (0.5 t)	13,250 shoots (2.5 t)	10,600 shoots (2 t)
Culm	1000 culms (3 t)	7000 culms (21 t)	5000 culms (15 t)

To establish plantations of *Neohouzeaua dullooa*, rhizomes are planted, with 3m x 3m spacing (1,110 per ha, plus 10% allowance for mortality). In the first two or three years, bamboo is intercropped with rice and serves as the perennial component of an agroforestry systems. During the intercropping period, weeding of the rice crop benefits the bamboo as well. By the time the annual crops are discontinued because of shading, the bamboo will be well established. The first thinning at age 3 is expected to generate about 5,000 culms per ha (valued at US\$ 0.03 per culms). At age 5 a culm will be priced at US\$ 0.05. About 100-110 days of labor per ha are required during the first two years of the planting. The average cost of inputs is US\$ 200 ha in the first year. The cost is largely labor cost to clear pilot sites, dig holes and plant trees. In the early years following establishment a low level of management (1-3 years) is required. This will involve weeding and pruning. This is equivalent to about US\$ 20 ha/year. After this about 50 days/ha/year will be needed, mostly for harvesting and transportation.

Good selective harvesting helps to thin clumps evenly, which promotes future growth. Heavy harvesting of shoots may reduce regrowth (Dinh Van Tu, 1996). For managed populations in forests it is recommended that only 1/3 of the stems are cut annually. Culms are best harvested from October to March, while shoots should be harvested from April to September.

In the last decade, government has tried to encourage forest planting and forest protection. Bamboo production has

increased in quantity as well as quality. But intensification in raw material production has had a number of constraints. Local people would rather look after natural regeneration than plant bamboo with the requisite inputs. Farmers conducting planting do so using traditional knowledge and low inputs. There is limited use of modern approaches and high input technology. Farmers do not know how to select seedlings, how to intensify planting and how to harvest sustainably. The main forest management activities of farmers are enrichment planting and reduction of undesirable species. Farmers plant not only plant bamboo but also cinnamon, cardamon and anise.

Bamboo forests are generally secondary growth following forest disturbance. Many older residents note that up to thirty years ago, the whole area was covered in rich forests, which were cut down leaving barren hills. Covering formerly bare hills with useful Truc and regenerating Nua is considered to be ecologically desirable. There is an appreciation that "re-greening" of these hills is due to land allocation programmes and forest recovery laws that were implemented in the past five years.

Use of bamboo

Bamboo has a diverse range of uses. In one household in Cho Don, we recorded its use as follows: woven bamboo walls, poles of house, roof poles, telephone and electrical wire poles, entire pig shed made of bamboo, woven screen for well to keep animals out, stake for pulley to get fresh water from well, woven fence surrounding newly hatched chicks, pole and baskets to carry on shoulders, clothes-drying line, bird cage, fence surrounding duck pen, fence surrounding garden, supports for hanging plants and orchids, stakes to hold up plastic bag "fence" to keep mice out of rice seedlings, support for sagging paddy walls, part of dam providing water to paddy fields, ladder, tobacco pipe, lighting sticks for pipe, baskets for winnowing rice, pathways lined with split bamboo for steps, picture frame holders, hooks for hanging pots in kitchen, firewood for stove (Dang Vu Can, 1971, Doan Bong, 1995; Dan Salter, 2000).

Bamboo also has numerous commercial uses. In Bac Kan province, there is a factory producing 1,000 tons per annum of paper, 2000 tons per annum of chopsticks, bamboo mats, curtain for export etc. For the production of 2,000 tonnes of chopsticks, 10,000 tons of fresh bamboo is needed. The waste from this production is used to make paper. Chopsticks and paper only account for 30% of total use of the raw material (Table 3).

Table 3. The proportion of raw material bamboo for final products in Bac Kan province (%)

Chopsticks	Mats	Corrugated sheet ¹	Paper	Furniture	Handicraft	Loss-sticks
10	20	25	10	20	10	5

(Source from NTFPs Project, 1999)

For households in Cho Don, the most important commercial use of *Neohouzeaua dullooa* is as chip-bamboo. Chip bamboo is made from bamboo culms, by cutting the culm into lengths of 0.5-1 m, and then splitting the lengths into 3-4 chips. This raw material is sold to middlemen. It is used to make many products such as mats, chopsticks, paper and handicrafts. 50% - 70% of households derive income from chip-bamboo. The second most important use is for paper processing and chopsticks, with households selling the raw material (whole culms) to the State Forest Enterprise in Cho Don. The third important commercial use is as bamboo shoots, which are popular fresh food, used in the preparation of many local dishes. A case study in Bang Lang commune, in Cho Don district showed the destination of bamboo raw material (Table 4). To make bamboo chips farmers harvested only 0.68% of available bamboo yield, only harvested 3.5% of available culms for paper processing and 50% of available bamboo shoots. Therefore more potential available quantity of bamboo in forest but more expect to sell and but has still limited marketing

Table 4. Availability and outlet market of bamboo products in Bang Lang Commune

Products	Available potential	Volume sale to outsiders	Sale for the SFE	Total sale
Bamboo-chip	10,500,000 culms/year	42,000 culms/year	30,000 culms /year	72,000 culms /year
Stem for paper processing	2,000,000 culms/year	20,000 culms/year	50,000 culms/year	70,000 culms/year

Bamboo shoots for sale	10 ton/year	5 ton/year	5 tonnes/year
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The producer household

Households involved in bamboo production do this activity as part of a range of other activities, including farming. 10-15% of total income (cash + subsistence) can be derived from bamboo. 20-30% of cash income comes from bamboo. Of all forest products, bamboo is the most important giving 60-70% of the total value derived from forest products. Bamboo production has been increasing over the last decade.

Labour demands for bamboo production are high in the planting time (April-May) and in the harvesting time (August to February). Harvesting can be done throughout the year, but the wet season is not as conducive because the high humidity limits processing and utilization. Harvesting for chip bamboo can be linked to market demand and the needs of the household. For bamboo planting, men clear plots, dig holes harvest and transport, while women plant trees, weed and prune. 30% of the labor requirement in plantations is met by women. Harvesting from forests is mostly done by men. Both men and women do splitting culms.

Farmgate prices for bamboo are shown in Table 5 which indicates that bamboo chip, provides the best price, this being marginally more than large diameter culms.

Table 5. Prices of raw material at the farm gate

Product		Price(US\$/kg)
Bamboo culm	Diameter > 10 cm; length 5-7 m	0.022
	Diameter >5-7 cm; length 3-5 m	0.02
	Diameter > 3-4 cm; length 4-5 m	0.012
Bamboo chip	Culms chipped in four pieces, length 0.5m	0.033
Bamboo shoot	Boiled	0.0033

State Forest Enterprises

There is not much support for farmers at the local level. The Ministry of Agriculture and Rural Development is present at provincial level through a Department of Agriculture and Rural Development. At the district level, the corresponding "division" is quite small and is often combined with other technical units (Warfvinge and Ngo Si Hoai, 1998). Much more important in providing support to farmers is the State Forest Enterprises (SFEs). The SFEs are in charge of bamboo and wood production, but also act as intermediaries between the State and farmers concerning bamboo activities. The State Forest Enterprises provide technical information and facilitate marketing bamboo.

SFE Cho Don also has production forests on state land (8000 ha) and a processing unit. It was established in 1956 to undertake logging and the tree planting, and to collect rattan. As forest resources became depleted, reforestation became an attractive alternative but such activities were dependent on state funds. The SFE Cho Don is organised into two sections: (a) production brigades and (b) processing and marketing units. The former are involved in forest planting, harvesting raw material and extension. The annual capacity of the SFE Cho Don is for the production of 2,600 tonnes of paper, 200 tonnes of chip bamboo and 1,000,000 fishing sticks. However, SFE Cho Don has limited marketing potential and operates under capacity.

The processing of bamboo

Before 1980 the majority of bamboo raw material from Cho Don was used for household construction and consumption. However, now households in Cho Don have become more integrated in the national bamboo industry (Table 6).

Bamboo mats and corrugated bamboo sheets

In this section we emphasize bamboo mats and corrugated bamboo sheets both made from chip-bamboo. These products are made outside of Cho Don, by Trung Van Company Ha Noi. The process used is shown in Figure 1. The company has 12 workers, with a capacity of 1000 ton/year.

Bamboo Shoots

There is very little processing required for bamboo shoots. The shoots are simply boiled, packed in a basket, and then transported by middlemen to cities. The harvesting household does the boiling and packing. For export sales, the shoots need to be processed for preservation. This involves blanching at very high temperatures, to kill bacteria and preserve colour prior to sealing in cans. Another type of shoot processing is to preserve them in salt (ngam chua) to sell through middlemen from cities in domestic markets.

There was formerly a state factory for processing bamboo shoots that closed some ten years ago. It only operated for 4-5 years and made a loss. The reason for failure is unclear, but it is likely to be a combination of poor management and lack of competitiveness, the latter possibly also a result of poor management.

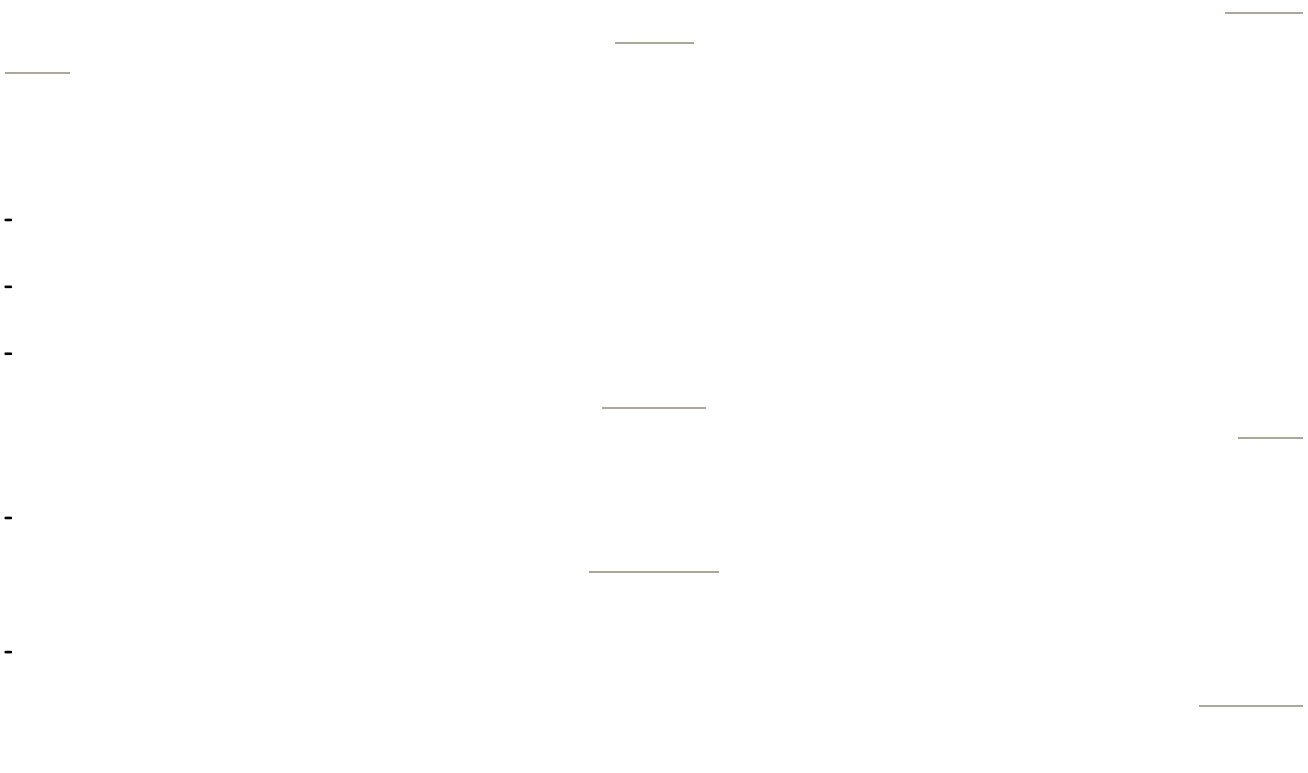
Table 6. Bamboo processing capacity in Vietnam for chopsticks, curtains, mats and handicraft

Name, location	Products	Production t/year
Trung Van forest product processing enterprise, Ha Noi	Chopstick	500
Ha Bac FPPE (??Clarify what the acronym means)	Chopstick	300
Lang Son FPPE	Chopstick	500
Backan FPPE	Chopstick	500
Cau Bieu FPP mill, Ha Noi	Mat, curtain, Chopstick	500
Cao Bang FPPE	Mat, curtain, furniture	500
Mien Nha FPP co-operative, Ha Tay	curtain, Chopstick	300
Hanoi FPPE	Mat, Furniture handicraft, Chopstick	500
SAWENCO, bamboo processing company Thu Duc-HCMC (??acronym)	Chopstick	1575
SADACO bamboo processing enterprise	Chopstick	1785
Saigon exported chopstick enterprise	Chopstick	1750
Dong Nai FPPE	Chopstick	1700
Thoi Hiep exported chopstick enterprise, HCMC	Chopstick	1700
Thoi Hiep exported chopstick enterprise HCMC	Chopstick	1300
An Binh chopstick enterprise, HCMC	Chopstick	1500
High plateau chopstick enterprise(Gia Nghia, Pleyku, Krong-apa, Darlac, Dacnun)	Chopstick	8750

Non-forest product processing for export enterprise Minh Trung HCMC	Curtain, mat	432
4 mill of small scale at HCMC (??what is this??)	Handicraft	1500
Linh so bamboo factory(Thuong Tin, Ha Tay)	Woven handicrafts	540
Quoc Oai co-operative	Woven mats	7875
Tuyen Quang mat factory	Woven mats	2625
Tho Xuan co-operative(Thanh Hoa)	Woven mats	5250
Hoa Binh mat co-operative	Woven mats	2600
Ninh Binh mat production units	Woven mats	1310

(Cited from Mr. Juha Kiuru, 1997. Prof.Ha Chu Chu, 2000)

Figure 1. Technology diagram of bamboo mats and corrugated bamboo sheets processing



State Forest Enterprise Cho Don

The State Forest Enterprise Cho Don processes bamboo into chopsticks, paper, weaving mats and fishing sticks. Capacity production is 2,000 tons per annum for paper 2,500-3,000 tons a year for chopsticks, and 1-2 million products from Truc, on which could be processing into fishing stick, stake on fence. In Bac Kan province there are four units for processing paper from Nua bamboo, with a capacity of 2,000-5,000 ton per annum (Ha Chu Chu, 2000).

Papermaking involves chopping the raw material into small pieces, and then boiling the material to soften the fibres. The pulp is then dried to the thickness and texture of the required paper. About 10 persons are involved in paper production in the SFE Cho Don (Table 7).

The State Forest Enterprise Cho Don (SFE) faces a number of constraints. Technical processing for bamboo is changing in line with market demands, but the SFE is not able to respond to the demands. There are limited incentives within SFE to improve the processing sector.

Table 7. Size of processing unit-average number of employees

No	Unit	Number of employees	remark
1	Processing timber	10	Base on Authority plan
2	Paper	10	Goof marketing channel
3	Chopstick	20	Semi-products
4	Fishing stick	10	Semi-products
5	Forest planting	45	Production raw material to supply one-self and to sell outsides
	Total employees	95	

Characteristics of trade and marketing

Chip-bamboo, bamboo shoots and culms for paper have been traded for a long time. In the past, bamboo was mainly transported by river due to poor roads. Now, with better roads, more bamboo is transported by truck than by river, but both methods are still used.

The trade in chip-bamboo and culms

The principle use of Nua in the study area is for paper/cardboard/packing material. Other uses, such as local construction, handicrafts, basket making, and woven mats for construction account for less than 30% of the production. There are four paper/packaging companies in Bac Kan. There is no formal trade network between farmers and the paper companies. The paper companies have representatives that travel around buying culms, loading trucks, and transporting the culms to the factories. The factories manufacture their products not only with Nua, but also a mix of other raw materials and other species of bamboo. The price of bamboo-chip at the farmgate is US\$ 0.03/kg, while the price of paper in Bac Kan is US\$ 0.2/kg and the price of corrugated bamboo sheets is US\$ 0.36/kg in Hanoi.

The trade in bamboo shoots

Bamboo shoots of Nua constitute an important market in the rainy season. These are collected by the farmers and sold within the communes to travelling merchants who take the shoots to city markets for sale. Village collectors have to boil and dry the shoots before sale. In the last ten years the market for bamboo shoots has been growing in Europe (Salter, July 2000). The price mark up at various stages of the bamboo shoot marketing chain is as follows: US\$ 0,02/kg at the farm gate at a distance from a road; US\$ 0,03/kg at the roadside trader; US\$ 0,11 at the provincial trade posts. There are often long-term agreements between roadside traders and transporters, thereby reducing transaction costs.

The trade in Bamboo culm

There are numerous traders who operate between the cultivator and provincial trade posts. These traders may be full-time or part-time, the latter purchasing Nua culms on an opportunistic basis. The traders sell it on to drivers of trucks collecting bamboo. The roadsides have become trade collection points for bamboo. Often farmers by the sides of the road become bamboo dealers, selling bamboo on behalf of farmers who live further from roads. Provincial trade posts are key trading centers for bamboo. They are generally made up of family businesses operating on a full-time basis. The traders

send transporters to the mountainous districts to purchase bamboo, either directly from commune level traders, or from farmers along roadsides. Key trade posts are located mainly at intersections of roads and rivers. At such places there are usually a number of private business persons involved in trading bamboo, from Hanoi, Thai Nguyen province, Ha Tay province.

The trade in handicraft

Bamboo exports (mainly handicrafts) have fluctuated widely in the 1990s (Table 8). Export value has varied between US\$ 36 million (in 1990) and US\$ 12.6 million (in 1995). The main destinations are Japan, Hong Kong, Taiwan, USA and the EU. The Ministry of Trade has targeted an export turnover of US\$310 million per annum from handicraft (including products made from bamboo and rattan), potentially making handicrafts one of Vietnam's 10 most crucial exports. The European Community is expected to be the large market for Vietnamese handicrafts again this year, earning more than \$90 million for Vietnamese craft exporters. Japan and North America are also major handicrafts markets for Vietnam, earning \$50 and \$25 million in export turnover respectively. Economists expect the demand for handicrafts internationally to increase by 26.2 per cent between 2001 and 2005 (Thu Ha, 2001).

Table 8 Value exported handicraft from Vietnam

Product	Unit	1990	1991	1992	1993	1994	1995
Handicraft	US\$ mill.	36	12.6	20.7	28.6	19.5	18.7

(VFSCP, 1997)

The international markets for bamboo handicraft products are vast. They cover a range of end uses such as laundry baskets, trays, furniture, window blinds, picture frames, flower vases, and planters, which is finished products from the handicrafts for export. But in Bac Kan province, understanding of international consumers and their tastes is way beyond the scope of local companies.

Although the export of handicraft may be as high as about US\$ 40 million per annum the domestic trade is also considerable. The raw material producer will supply raw materials to the roadside trader or directly to a transporter. The transporters may be independent middlemen or agents of the processor. The processor will then undertake semi-processing, manufacturing and marketing with the product eventually reaching the consumer. In some cases the handicrafts are made by the farmers, as illustrated by mats. Farmers making the mats generally sell them to roadside farmers. They in turn will sell them to transporters who are the agents of wholesalers usually based in provincial key trading posts. These are then sold to retailers who supply the consumers.

Ethnic and family ties often play an important role in the structure of trade and distribution. The longer the distribution channel is, the smaller is the share of the final consumer's price that accrues to the farmers. In addition, the large number of middlemen also effectively reduces the flow of market information (on prices, buyers, volumes, end-uses, quality, etc) to the primary producers.

Policies Affecting Raw Material Production

Major changes in government policies occurred from the late 1980s. Policies became more focussed more on "rehabilitating" and developing forest resources (Nguyen Quang Ha, 1991). Another political change was the shift from "traditional forestry" to "people's forestry". This was taken to mean a formal change towards people's participation and the stimulation of the development of household economies (Fingleton, 1990). In the last decade, forestry laws have improved forest protection and have paid greater attention to environment issues. There have also been tighter controls on forest destruction and the illegal trafficking of forest products. As a result, total forest cover in Vietnam had increased by 1.6 million hectares; or nearly 17 per cent since 1995.

Decree No 02/CP of January 1994 on land allocation provided detailed guidance for the allocation of forestland and forest. It stipulates that the state allocates forestland to organizations, households and individuals for stable and long-term use according to specific conditions for each category of forest. Decree 02/CP specifies in detail the requirements for application for forestland allocation and for issuance of a land tenure certificate. Responsibility for issuance of certificates lies with the local Department of Land Management, whilst the responsible body for forest management is required to cooperate in implementing the necessary formalities. The contracting of forests for protection, regeneration and plantation is further regulated by Decision 202/TTG of May 1994 and Decree 01/CP of January 1995 with regards to land over which a state business holds a land use certificate. The regulations give state organizations the right to contract

the land for which they hold a land use certificate to households and other organizations for protection, regeneration and planting. The holders of the contract are entitled to receive payments but do not receive full land use rights. Decree 01/CP further prohibits the contract holder from building permanent structures on the land or from transferring the contract to another user in case he cannot fulfill the obligations set out in the contract (Christ and Kloss, 1998). Based on the above-mentioned decisions by the end of 1996, about 6 million hectares of forestland had been allocated: about 4.5 million hectares to the SFEs, 0.5 million hectares to collective bodies, and 1 million hectares to 334,000 households. Most of the forestland allocated so far has been for protection. It is believed that the forest protection contracts (FPCs) to individual households are a short term, costly and unsustainable option. This type of forest protection fails to deliver long-term incentives to local communities for sustainable forest management, and they also face considerable administrative difficulties. Therefore they can never be an effective substitute for longer-term stewardship agreements (IUCN, Birdlife, WWF, Helvetas, Jan. 2001).

The Decision No 661 by the Prime Minister on objectives, tasks, policies and organization for the establishment of five million hectares of new forest name of July 1998 is set to have a major impact on the Vietnam landscape. The intention is to increase forest cover to 43% of the national territory, protect the environment, decrease the severity of natural disasters, increase water availability, and protect biodiversity. The aim is to use open land and bare hills efficiently, create employment opportunities, contribute to hunger elimination and poverty reduction, support fixed cultivation and sedentarization, increase income for mountain rural people, create stable social conditions, and strengthen national defense and security, especially in border areas. It is hoped that the new forests will provide material for construction, paper, wood-based panels, non-wood products and fuel wood and thereby stimulating the processing industry and the forestry sector in general.

At province and district level there are specific regulations. The main content of the regulations is that governments at all different levels, especially communes, should further define the responsibilities for forestry production and management, define the rights, obligation and benefits of the owners and users. Contracts should be signed for the management of the forestry area; and the rights and obligations in the contract should be strictly enforced. These regulations aim at protecting the legal rights, and benefits of the villagers. The local governments in Cho Don encourage the villages to develop economic forests. Additional support comes through credit programs and seedlings provision. The agricultural and forestry extension institutions provide technical assistance. There is one policy which is applied to the whole province – no taxes are to be levied on NTFPs (including bamboo) which are collected or planted and sold in the markets by the villagers. The middleman must pay a national resource tax of 5% when he purchases the products such as bamboo shoots, bamboo chip, and fuel wood. If traders can transport bamboo to other districts or other provinces they have to pay the tax. Villagers are allowed to collect bamboo from their own or contracted land. But in other types of forest such as state forest and community forest, such collection is banned. Some households have received support for bamboo planting, being US\$ 50/ha. State intervention in the production of bamboo has generally been increasing in the last decade. The type of support is diverse, such as building capacity, training programs, and technical support on raw material production.

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