

Report on value chain of ivory bamboo

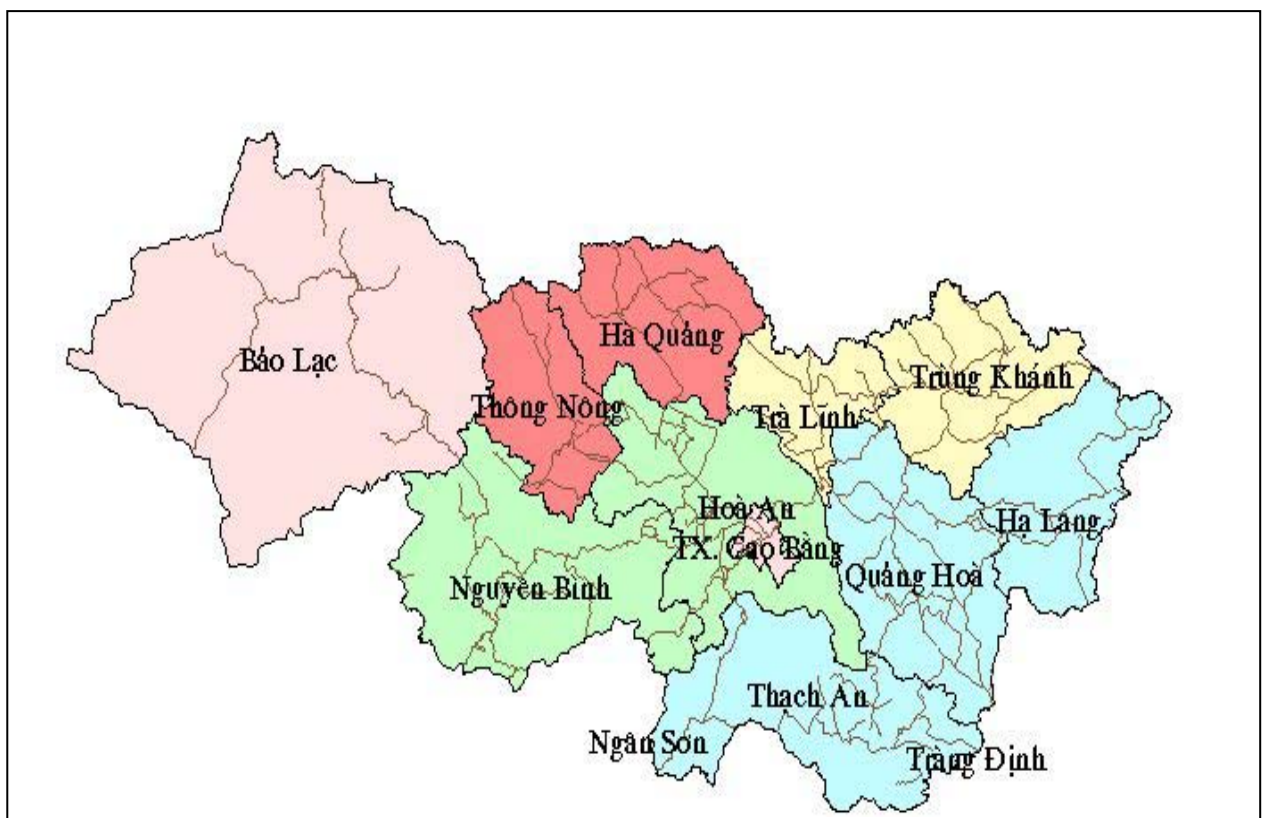
I. General information

1. General situation on the value chain of ivory bamboo

a. General information about production

- Growth and development characteristics of ivory bamboo: The plant can grow and develop well if the land fatness and humidity are above 70% and average annual temperature is in from 5 to 28⁰C.

The ivory bamboo is mainly planted in 4 western district of Cao Bang, i.e. Bao Lac, Bao Lam, Thong Nong and Nguyen Binh with total area of approx. 10,000 ha. Among the above, Bao Lac and Nguyen Binh are the 2 districts with the largest plantation areas where Nguyen Binh, having 1,500 ha (which is expected to increase to 1,730 ha in 2010), has the best quality bamboos. The bamboo bodies are straight, consistent in size, specifically and naturally yellow and suitable for processing. During harvest time, each ha of plantation turns around about 10,000 bamboos a year on average with total annual output of the province at 1 million bamboos. During 2006-2010 period, the ivory bamboo plantation area is increasing fast after the provincial people's committee has instructed Cao Bang Export Bamboo Company to implement the bamboo plantation project with total investment of approx. VND10 billion.



- Soil preparation

+ Land for ivory bamboo plantation must be warm enough, have thick layer, low mixture of stones, be rich in humus (>4%), nitrogen (<0.3%) and absorbable K₂O. The soil should be from moderately to heavy loamy and easy for water absorption..

- Ivory bamboo is not planted on soil mixed with sand, grass field, too thin layer or poor land.

- Seed selection

+ Ivory bamboo is planted from the plant root or underground body of the young bamboo at 1-2 years' old.

+ The underground body sections of 40-60 cm in length with 3-4 nodes are selected.

+ The seeds are preserved for maximum 5 days.

+ There should be a fertilizer hole before planting to ensure high ratio of success.

- Planting techniques

+ Prepare the soil, clear all bushes, tree roots and branches in the plantation areas.

+ Dig a hole with dimension of 60 x 30 x 30 cm. Planting density is around 400 trees a ha (5 m x 5 m).

+ Dig the hole 1-2 months and fill it up 1 week before plantation.

- Plantation crops:

+ Winter – spring crop is from December to next February.

+ Autumn crop is from August to October

- Planting method:

It can be pure bamboo plantation or in combination with other short-term industrial plants like highland rice, corns, beans, cassava, etc.

It can also be planted with other wood plants like canarium or anis in order to create a 2-layered structure to prevent young sprouts from being broken by strong wind, retain air humidity, strengthen the protective function of the bamboo forest, reduce the risk of insect epidemic and increase income for the farmers.

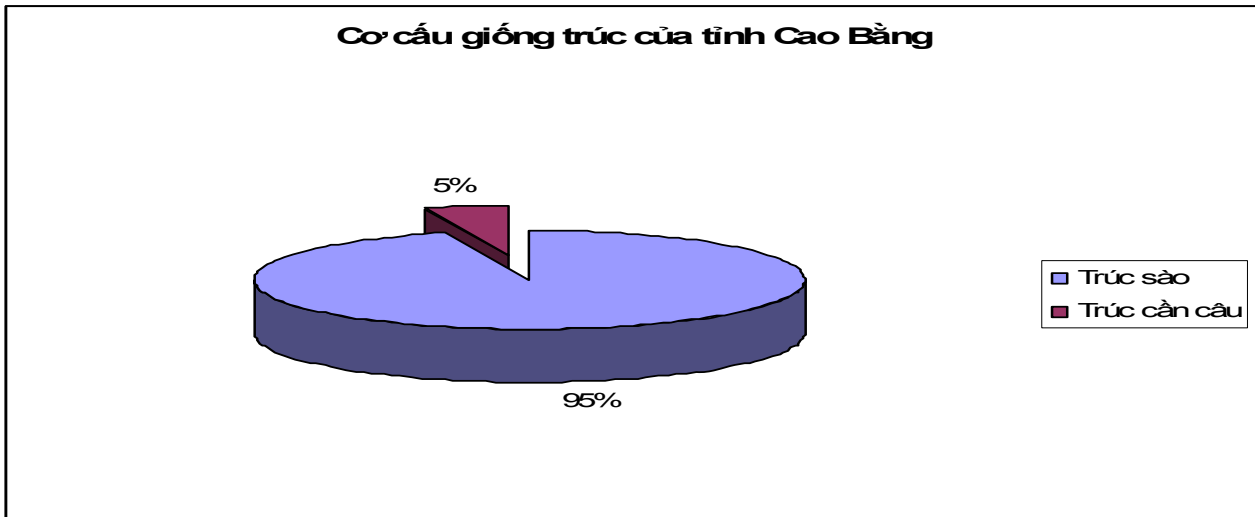
- Harvest:

+ The ivory bamboo only starts to generate high and stable yield from the 5th year onwards. As such, it is advised to only cut trees from 3 weeks or older with total number of cut-down not

About 80% of the bamboo plantation area in the province is above 15 years' old. The seeds for new plantation are taken out by the households from their existing gardens. The most difficult technique for bamboo planting farmers now is seed extraction. Each person can only extract, transport and plant 5-8 new roots in a day on average.

A specific characteristic in the province's bamboo production is that the tree is planted in 2 methods which is centralized and decentralized plantation gardens. Centralization method helps save the labor costs to clear the weed and bushes, time in harvest and transportation while decentralization method (to make use of any available land area) requires more labor work but the farmers can plant other trees right in the bamboo garden.

There are only 2 plants of bamboos planted in Cao Bang which are ivory bamboos and rod bamboos. The ivory bamboos are double in length as compared to rod bamboos (which are only 3-4 m high) and triple in size.



b. Market information and product development

Previously, farmers only planted bamboos for their own use (e.g. weaving, fencing, roofing, surrounding wall, etc.). The tree plantation was to make use of the land areas which are not suitable for other plants in high slopes, stream or garden corners. The bamboos are planted in grove, self-reproduce and gradually expand into a garden. During 1994-1995, products from bamboo were selling well and generated good economic profit (with selling prices as double as compared to similar products). Revenue from bamboos has become an important source of income for the farmers. After that period, the bamboos entered in a difficult time again when selling price was halved coupled with many difficulties in exploitation (e.g. difficult transportation, heavy carriage). Each bundle of bamboos (comprising of 10-12 sections of 4-4.2 m in length) is paid VND20,000 on average while a healthy porter can only cut and carry 2 bundles. Such difficulties have pushed the farmers into a situation where the bamboos were ready for harvest and buyers were available but they did not want to sell.

2. Institutional environment and development policies of the value chain

a. Cao Bang province's ivory bamboo development project in 2001-2020

The province is implementing the Ivory Bamboo Development Project during 2001-2020 which was approved by the people's committee under Decision 98/QĐ-UB on

21/01/2002. The project objectives are (i) to establish a centralized ivory bamboo material zone of 3,047 ha by 2020, (ii) to create more jobs and improve the people's incomes from the plant, contributing to the hunger elimination and poverty reduction in the plantation areas and (iii) to establish a centralized plantation area to increase the land coverage, prevent land slide and improve the environment.

The project is carried out in 19 communes in 4 districts of Bao Lac, Nguyen Binh, Thong Nong and Hoa An with total new plantation area of 3,047 ha and total investment capital of VND10,717.4 million, in which VND5,476.6 million is from the State budget and VND5,240.8 million from preferential loans. The project is carried out in 4 phases.

The investment incentives are specified in Cao Bang People's Committee's Decision 2589/QD-UB on 20/11/2002 as follows:

- The investors receive a subsidy of 80% of the expenses for buying qualified plant seeds.
- The investors can borrow VND2 million for caring each ha of bamboo with loan tenor of 3 years and 50% interest subsidized by the State.
- Farmer households involved in the projects will receive technical training and be entitled to all the bamboo products from their forests.

b. Instructive guidance on contractual consumption of agriculture products

In order to implement the Prime Minister's Decision No. 80/2002/QD-TTg on 28/05/2003, the provincial people's committee has issued directive No. 17/2003/CT-UB to encourage the consumption of agriculture products through investment and procurement contracts. The main contents of the contracts are (i) individual and corporate traders who did not invest and assist farmers in ivory bamboo plantation are not allowed to sign sales contracts and procure bamboos from the farmer; local authorities have to disseminate the province's direction in bamboo development and encourage the farmers to actively involve in the plantation, sign contracts and sell bamboo products to Cao Bang Bamboo Processing and Exporting Company; (ii) forest offices are to coordinate with market watchers, provincial police and district people's committees to prevent individuals from competing with Cao Bang Bamboo Processing and Exporting Company in product procurement from farmers in the locality; (iii) the company is responsible for disseminating the bamboo plantation and exploitation processes to the farmers to ensure the stability and sustainability of the

forests, signing procurement contracts with the farmers right from plantation step and procuring the products at reasonable prices.

II. Current situation of the value chain

1. Activities in the value chain

- Material inputs are supplied to the farmers right in the plantation areas. Besides plant seeds and labors, the farmers do not have to invest in any other expenses. In order to expand and renew their bamboo gardens, the farmers can pick up plant seeds from their existing gardens or get them from their acquaintances in the villages (normally from relatives or friends)

- Production step includes specific activities like plantation, caring and exploitation. The trees are planted at 2 points of time, i.e. early autumn and early winter, when it is cool and rainy and the bamboos are not shooting young sprouts. These are favorable times for new plantation. The most investment expense in caring the bamboos is labor work to clear wild weed and bushes around in the plantation areas. The farmers are facing difficulties in exploitation, especially in transporting the products from plantation areas to centralized procurement points (normally at small commune collectors or vacant land fields along national roads).

- For procurement activities, the above difficulties lead to various forms of sales by the farmers. There are 2 main forms of selling in place, which are total sales (of the entire garden) and individual sales. Those farmers living near the roads and having many labors often choose the latter one. This form is advantageous in maintaining sustainable and stable growth of the forest in future and allowing good quality of young sprouts. Those living far away from the procurement points and those requiring substantial money for family spending usually choose total sales. In this form, the buyer and the farmer agree a selling price for the entire garden. This form is disadvantageous as the pricing is usually incorrect and unfair to the inferior party, especially the poor households. Besides, this form of selling also results in rapid downgrading of the bamboo gardens as the trees are exploited too early while the quantity and quality of young sprouts are not ensured. The distances from farmers' bamboo gardens to commune center and the nearest markets are as below.

Table1: Distances from bamboo garden to commune center and nearest markets

Criteria	Household type	Average
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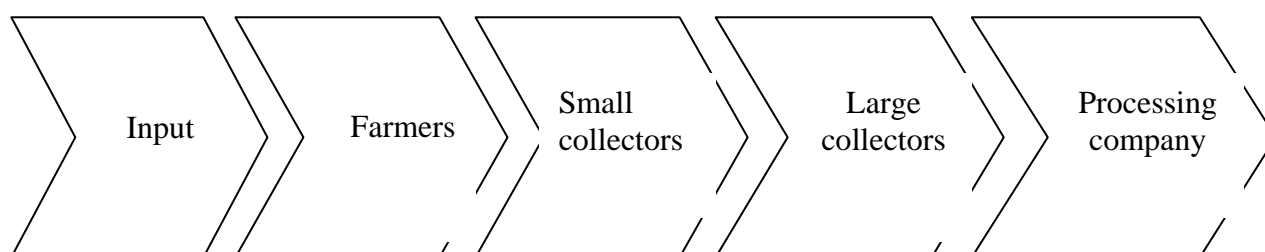
	Poor	Medium	Fair	
Average distance to commune center	2882	1885	1300	2545
Average distance to nearest market	8625	8546	7400	8510

The table shows that the poor households are facing difficulties in transporting their products from the gardens to selling places. The households with more difficulties are more distant from commune center and the nearest markets.

- In processing step, there is only one ivory bamboo processing company in Cao Bang province. Their main products by annual revenue include mats, curtains, tooth picks and table sets. Total annual revenue is around VND11 billion. Their products are sold in the northern markets and exported directly to Taiwan and Eastern Europe. The products are processed in a modern production line which attracts a substantial number of workers of approx. 200.

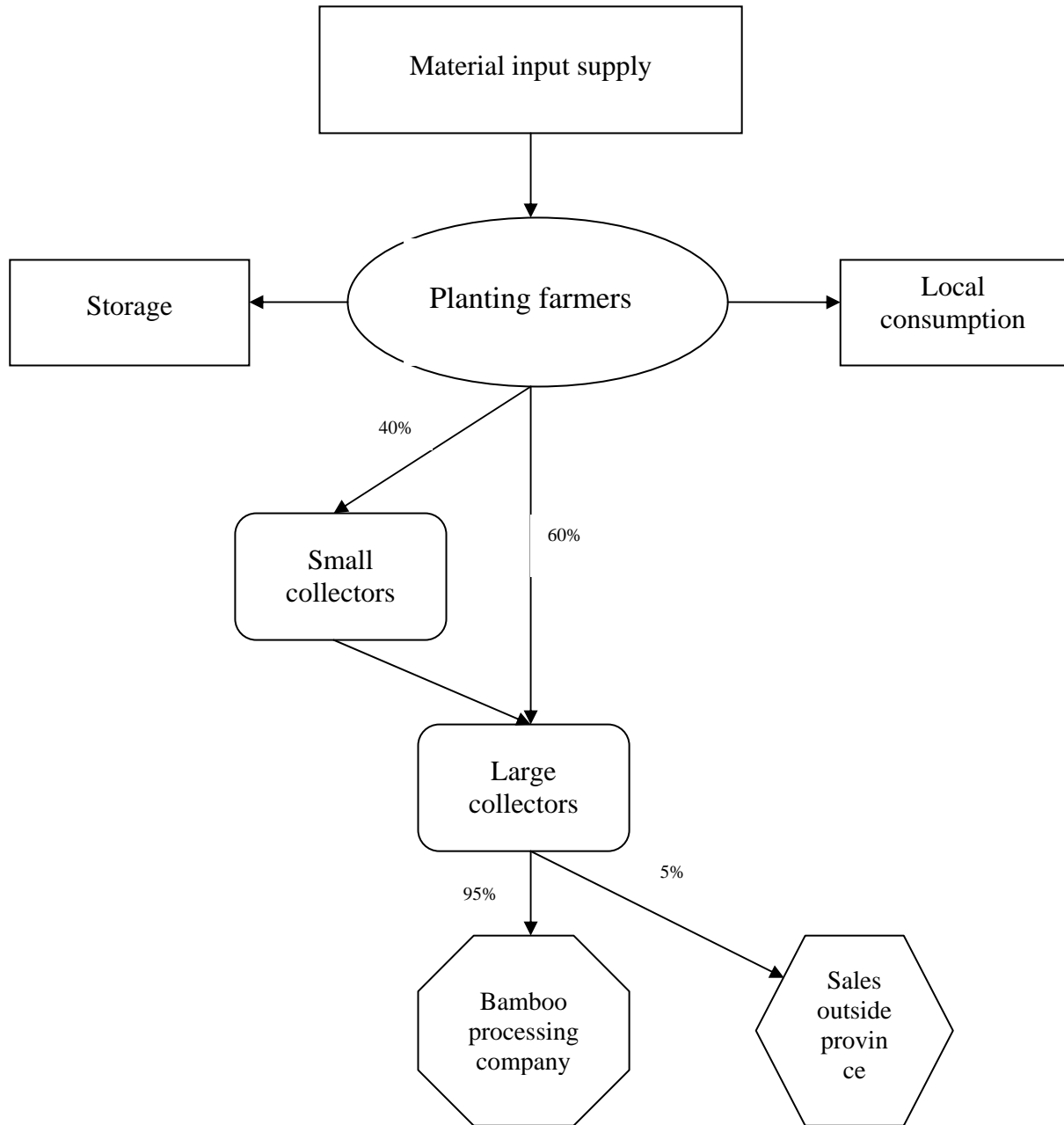
Besides, the bamboos are also processed by the planting farmers themselves. Main activities are weaving and fencing.

2. Actors in the value chain



- | | | | | |
|--------------|--|---------------------------------------|---|--|
| - Plant seed | - Planting and caring | - Buying bamboo from farmers | - Buying bamboos from small collectors | - Buying bamboos from large collectors |
| | - Harvesting, transporting and selling to collectors | - Selling bamboos to large collectors | - Transporting and selling products to processing company | - Processing into products |
| | | | | - Selling products to market |

Diagram 1: Consumption of bamboos in Cao Bang



The first actor in the value chain is input material supplier. The input is plant seed which can be obtained from relatives or friends. Very few households, mostly beginners, have to buy the seeds at price of VND2,000 a root.

The planting farmers are involved in input exchange and selling bamboos to the market. In the province's value chain, the poor directly involved in plantation and seed supply accounts for 80% of the total number of households.

Small commune collectors are those having capital and locating along inter-commune roads or those having a department store. They buy bamboos from the farmers and sell to larger collectors. About 40% of the farmers' bamboo output is bought by these commune collectors.

Large collectors are those having large capital base and cars as transportation means. They buy 60% of the bamboo output directly from planting farmers. All large collectors at district level procure the bamboos directly and transport to Cao Bang Bamboo Processing and Exporting Company (95%) and other provinces (Hanoi, Hai Phong, Hai Duong, Vinh Phuc, etc.) for sales. Buyers outside the province use bamboos for decoration in restaurants, entertainment facilities or reselling to consumers as fences, shelves in agriculture production.

3. Description of the actors' activities

The planting farmers' consumption of input is as follows.

Input consumption	Household type		
	Poor	Medium	Fair
Not using	59.09	46.15	40
Plant seeds	40.91	53.85	60
Fertilizer	0	0	0

As shown above, there is only one input used in planting and caring bamboos, which is plant seed. The consumption ratio differs among the households where the 60% of the fair households use seeds and only 41% of the poor ones use seed in new plantation in the last 5 years. The reasons are that selling price of bamboo is currently too low, the trees can only be harvested after at least 5 years and the poor cannot generate any immediate income from the bamboos and have to give priority to other plants like cassava or corn in their production plan. Meanwhile, fair households whose income is quite stable plant bamboos and expect a good future income. Currently, the plant seeds are mainly supplied right inside the commune. Buyers are relatives or neighbors. The purchase prices and timing are summarized below.

In percentage

Criteria	Household type
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	Poor	Medium	Fair
Free of charge	83.33	100	66.67
At VND2,000 per root	16.67	0	33.33
Purchase every month	0	0	0
Purchase during crop	100	100	100
Purchase at any time	0	0	0

The bamboos produced by the farmer households are to meet the local consumption demand and reserve at their gardens, not for sales. As such, the bamboos sold in the markets are through 2 actors, i.e. small commune collectors and large district collectors.

The table shows that all the medium households do not have to spend in seed purchase while 83.33% of the poor households get the seed free of charge. Among the above 3 groups, the fair households have the highest ratio (33.33%) of seed purchase at VND2,000 per root. This is because poor households plant in small scales with small quantity of seeds (which they can get from their acquaintances in the village without any expenses)

According to the survey, only 6 households have to pay VND2,000 for a root (equivalent to the selling price of a bamboo tree) but the buyers have to dig and transport the bamboo roots themselves. They only account for 6% of the total number of households. Most of the seeds are from friends and relatives [original sentence is incomplete]

Besides, farmers in the plantation areas are also involved in the province's bamboo development project. Total areas of bamboo planted under the scope of the project during 2001-2005 period were approx. 300 ha. The project gives priority to assist poor households where farmers receive supports in seed purchase expenses, technical training and signing sales contracts for output products. Total areas of new plantation in 2001-2020 is projected at 3,047 ha, in which 1,012 ha have been planted during 2001-2005 and the remaining 2,035 ha during 2006-2020.

Criteria		Household types		
		Poor	Medium	Fair
Involving in plantation project	Allowed to participate	48.57	53.85	50
	Not allowed to participate	51.43	46.15	50

Reasons for non-participation	Not selected	76.47	66.67	100
	Others	23.53	33.33	0

The table shows an irrationality in selecting the objects of investment supports. The project objective is to give priority to selecting poor households for participation. However, the ratio of poor households participating in the project is the lowest one among the 3 groups at 48.57%, as compared to 53.85% for medium and 50% for fair households. The main reason for non-participation is that they are not the selected objects for the project, which includes 100% of fair households. Other reasons for non-participation include lack of land bank for new bamboo plantation, lack of capital, independence from the project, actual low and unstable income from the bamboos. Though the existing bamboo area of the province is capable of supplying sufficient seeds for new plantation, the farmers' demand is not always full met in terms of quantity and quality of seeds. As such, information on the seed suppliers is quite important to the new planting farmers, especially the poor ones.

Criteria	Household type		
	Poor	Medium	Fair
Own search	85.71	100	100
Introduced by others	7.14	0	0
Introduced by unions, associations	7.14	0	0

When the households have to buy (or ask for) seeds for new plantation, the information in seed suppliers is mainly obtained by the farmers themselves. 100% of the medium and fair households conduct their own search on seed suppliers. Meanwhile, the poor households, without sufficient information like the above groups, have to seed assistance in obtaining information on seed suppliers. 14.28% of the poor households need assistance from other persons or unions / associations. The supply capacity in the market is assessed below.

Criteria	Household type		
	Poor	Medium	Fair
Able to buy / ask for at any time	27.78	0	33.33
Sometime not available	0	0	33.33
Available but limited	50	100	0

Very limited	11.11	0	33.33
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As a long tradition, ethnic people in the bamboo plantation areas have been planting ivory bamboos for production of their own home utilities and agriculture production tools. Their experience has formed a practice in selecting the seed, planting and caring methods as well as in selecting hill slopes with suitable soil conditions for good growth and development.

As shown above, most of the households viewed that the seeds are available but limited, which is voted by 50% of the poor households and 100% of the medium ones. This is because there is currently no sale and purchase of plant seed, the buyers do not want to pay while the sellers do not want their garden to downgrade as a result of seed extraction. The ratios of households rating that the bamboo seeds are very limited are quite high at 11.11% of the poor group and 33.33% of the fair group. The above difficulties will hinder the expansion of bamboo plantation in the coming time. Difficult transportation and telecommunication infrastructure are causing obstacles to the information flow on production activities.

Criteria	Household type		
	Poor	Medium	Fair
Unknown	38.89	33.33	33.33
Provided by local authority	0	0	33.33
Others	61.11	66.67	33.33

As shown above, the ratios of households not knowing any information on seed prices, quantity and quality before new plantation are quite high as 38.89% of the poor group and 33.33% of the medium and fair ones agree with the comment. This is because (i) the farmers do not have to pay for the seeds so they do not care about the price and (ii) they are not allowed to choose the seed and unable to assess the seed quality. For the others, information relating to the inputs is provided by relatives or family members. Over 60% of the medium and fair households can obtain information on input from their acquaintances.

Though the households do not have to spend in buying plant seeds, not all of them can exchange inputs favorably.

Criteria	Household type		
	Poor	Medium	Fair

No risk faced	72.22	66.67%	100.00%
Poor quality goods	0	33.33%	0
Wrong timing	27.78%	0.00%	0

As shown above, the fair households are not facing any risks in input exchanges. The 2 main risks faced by the households in input exchanges are poor quality and wrong timing of the supply. The poor only faces the risk of buying at the wrong timing with 27.78% of the households. Bamboos are planted in 2 crops in each year. The winter – spring crop is from December to the next February, while the autumn crop is from August to October. As the new crop begins at the harvest of the existing one, the farmers planting new bamboos will face difficulties when buying or asking for seeds. However, the above risks do not impact much to the households’ new plantation as all of them assess the impact as insignificant. The household groups’ risk in input exchange are also affected by the number of suppliers and demand. The number of seed suppliers in the province is as follows:

Comment on the number of input suppliers	Household types		
	Poor	Medium	Fair
Many	5.56	0	0
Moderate	44.44	50	100
Limited	11.11	0	0
Difficult to assess	38.89	50	0

As shown above, most of the households assess the number of input supplier for bamboo production as “moderate” with 44.44% of the poor group, 50% of the medium and 100% of the fair groups’ agreement. Only 5.56% of the poor households rate that there are many suppliers while 38.89% of the group are unable to assess the number of suppliers in the locality. The high ratio of poor households unable to assess the number of suppliers clearly indicates their difficulties in accessing information. Most of them are living in highland and remote villages which are far away from commune center and markets. Besides, inter-village and inter-commune transportation is still difficult with clay or stone roads, making vehicle access impossible.

Criteria	Household types		
	Poor	Medium	Fair
Very difficult	74.36	68.18	0

Normal	17.95	22.73	100
Convenient	7.69	9.09	0

As shown above, the poor group has the highest ratio of agreement of 74.38% that road transportation is very difficult, followed by 68.18% by the medium group. The fair group has the highest ratio of assessment that transportation condition is normal. The difficulties in transportation cause obstacles to the poor's participation in agriculture product markets. As such, it is necessary to give priority to developing transportation infrastructure in high and remote villages for hunger elimination, poverty reduction, increase of the poor's income and improvement of their market participation capability.

Comment on quality of input	Household types		
	Poor	Medium	Fair
Good	0	0	0
Normal	35.29	50	0
Poor	0	0	0
Difficult to assess	64.71	50	100

It is currently difficult to assess the quality of input as 64.71% of the poor, 50% of the medium and 100% of the fair households agree with this comment. In general, the producers do not care much about the quality of their input as bamboo is yet to be their main source of income. This is also shown in the purposes of many households participating in the province's ivory bamboo development project. Many of them plant the bamboos in land areas which are not suitable for the tree to grow, do not select the best seed for new plantation. Their main purposes of participation are to save investment expenses and receive money supports of VND3,120 for each qualified tree product.

Output

The bamboos are exploited every year with main crop of harvest from June to next January. During the remaining time, the trees shoot young sprout and are not suitable for harvest. Current difficulties in consumption do not discourage Cao Bang people in bamboo plantation. On the contrary, bamboos are regarded as a plant with high economic value and significant contribution to their income in future. However, there are still shortfalls in the production process (i.e. new plantation and caring of the tree)

while product consumption needs to be more specialized to earn the farmers' confidence in selling their products to processing company.

Product selling trend in the recent years	Household types		
	Poor	Medium	Fair
Not for sales	70.73	15.38	60
Increasing significantly	0	30.77	0
Increasing slightly	9.76	15.38	0
No movement	12.2	30.77	40
Decreasing	7.32	7.69	0

As shown above, the ratio of households not selling their products are high in the recent years with over 70% of the poor and 60% of the fair group. Besides, over 7% of the poor and medium groups are selling less products. The main reason is low and unstable selling prices with 50% of the poor and 60% of the medium groups' agreement. Besides selling prices, the poor households are facing difficulties in transportation with 25% vote. With shoulder and walking as the main form of transport of products from production to selling places, the poor is facing even more difficulties in carrying their products from bamboo gardens to the centralized procurement points. This is also the main reason for many poor households to choose total sales despite more risks in terms of selling prices as compared to actual value.

Reasons for changes in sale output	Household types		
	Poor	Medium	Fair
Loss of crop	0	0	50
Low and unstable prices	50	60	50
Difficult transportation	25	0	0
Expanded production scale	25	40	0

Though the ratio of households saying that their sales output in recent years remain unchanged or decline, the selling prices are on decreasing trend.

Movement trend of selling price in recent year	Household types		
	Poor	Medium	Fair
Increasing	18.18	0	0

Decreasing	63.64	81.82	50
Unchanged	18.18	18.18	50

As shown above, 63.64% of the poor households and over 81% of the medium ones say that selling prices are decreasing. Currently, they are mainly selling directly to the traders (collectors). Only 8% of the poor households sell their bamboos to local consumers. The reason for the poor to sell to traders (with over 90% agreement) is cash payment. As poor people in the mountainous areas usually do not or only have little capital, they have to borrow or sell their assets or goods for money whenever spending demand arises. Though the bamboo is not bringing in high income for the farmers, it does help them in solving current difficulties.

Time of selling	Household types		
	Poor	Medium	Fair
Selling regularly	8.33	0	0
Selling at crop	25	18.18	0
Selling whenever necessary	66.67	81.82	100

For retail sales whenever money is need, the farmers can earn about VND20,000 for each bundle of bamboos, which is only sufficient for daily food and foodstuff. As such, the farmers do not care much about market information before selling their bamboo products.

Market information before sales	Household types		
	Poor	Medium	Fair
No information	41.67	72.73	100
Provided by others	50	27.27	0
Provided by unions	8.33	0	0

Lack of information and output market is the main reasons resulting in risks to the farmers when selling their products.

Risks in selling products	Household types		
	Poor	Medium	Fair
No risk	27.27	27.27	50
Low price due to lack of information	54.55	72.72	50
Others	18.18	0	0

As shown above, about 55% of the poor and 72% of the medium households have to sell at low prices due to lack of market information. Consumption market which is contained inside the province has created a “virtual” stability without competition and the farmers, especially poor ones, are the most inferior actors. With profit maximization purposes and lack of business transparency, the collectors are providing insufficient and inaccurate information on prices to farmers or even separate their procurement areas to reduce competition and squeeze the farmers’ selling prices.

4. Price setting and profit sharing among the actors

In VND per tree

	Input purchase	Caring	Porter	Transport	Other expenses	Selling price	Profit
Farmer	0	50	0	1000	0	1800	750
Commune collector	1800	-	0	0	115	2000	85
District collector	2000	-	40	500	180	2900	180
Processing	2900						

The farmers only have to invest in labor work to care for the trees and transport their products from plantation garden to selling places. Total expense is VND1,050 per bamboo while average selling price is VND1,800. As such, the farmers can earn VND750 for each bamboo on average. This is also the actor with highest unit profitability in the value chain. For each ha of bamboo, the farmers can earn about VND750,000.

Small commune collectors buy the bamboos from farmers at VND1,800 and only have to spend about VND115 for roofing. Selling at VND2,000, they earn a profit of VND85 per tree. This is the actor with lowest unit profitability. With total annual procurement output of 10,000 to 15,000 trees, their total income ranges from VND850,000 to VND1,200,000 a year. It takes them from 15 to 40 days to fully fill a truck load for district collectors. Due to long time taken and unattractive profitability, many commune collectors have shifted to other business activities.

District collectors buy bamboos from commune collectors at VND2,000, hire porters to unload the bamboos at VND40, spend VND500 for fuel, VND180 for other

expenses (e.g. depreciation, paying natural resource taxes, etc.) then sell the tree to processing company at VND2,900 per tree. Their profit is about VND180 per bamboo. With total procurement output of 70,000 to 80,000, their annual income is around VND12,600,000 – VND14,400,000 per annum.

Processing company buy bamboos from district collectors at VND2,900 per tree on average. Their procurement prices and output in 2006 are as follows

- Big bamboos with 4.2 m length and Φ 4.5 – 7 cm diameter:
VND3,200
- Medium bamboos with 3.2 m length and Φ 2.5 – 4.4 cm diameter:
VND2,500
- Small bamboos with 2.1 m length and Φ 1.5 – 2.5 cm diameter:
VND2,000

The bamboo purchasing and selling prices are currently much lower than in 2003 (before the province people’s committee instruction prohibited selling bamboos outside the province). Selling price decreased by about VND1,000 for big bamboo and VND500 for small one on average.

Table . Bamboo procurement output in Cao Bang
In tree per year

Year \ District	Total value (VND billion)	Output (tree)	Bao Lac	Nguyen Binh	Thong Nong
2004	2.64	940,000	558,000	372,000	10,000
2005	3.45	1,142,000	790,000	340,000	120,000
2006	3.1	1,000,000	550,000	400,000	50,000

5. Inter-actions among actors

* For consumption channel 1: Farmer’s production – Small local procurement – Large district procurement – Processing company

- Small commune collectors are those living in the same community with producers and having regular contacts with each other. Procurement prices quoted to producers are comparable due to easy information flow among households in a small community. Procurement prices depend of the product quality. Commune collectors only buy bamboos at home if bamboo storage field with roofing is available. Bamboo

sellers are responsible for transporting the trees from their gardens to the collectors' places. The sellers shall receive immediate cash payment upon delivery; farmers do not accept selling on credit as they need money for immediate expenditure. However, as the procurement price is lower than of district collectors, the producers give priority to selling directly to district collectors instead of small commune collectors. As such, the number of commune collectors is decreasing to shift to other businesses. Currently, each commune only has 1-2 collectors on average.

- Large district collectors have close relationship with commune collectors and processing company. They have transportation means and regularly procure bamboos from the commune collectors (i.e. one trip every 2-3 days during harvest season and every 15-20 days in other time of the year). They can procure bamboos from many small commune collectors in each trip. District collectors are responsible for providing information on purchase price and quality as required by the processing company. They are facing difficulties in payment as all payments to small commune collectors are immediately in cash while they do not receive cash payment when selling to processing company. Normal credit term is 3 months, sometimes extended to 6 months without any additional interest. District collectors without large capital base also have to shift to other businesses. Each district currently has about 4-5 collectors on average.

- Cao Bang Bamboo Processing and Exporting Company is the sole buyer of bamboo products with substantial volume. The company only buys bamboos from large collectors at its door. Information on their procurement prices and quality is provided in advance to the district collectors. However, the collectors can hardly sell at the announced prices.

For consumption channel 2: Farmer's production – District procurement – Processing company.

The relationships among the actors are similar to the 1st channel, except for the different relationship between producers and district collectors. Due to large area, difficult transportation, limited number of commune collectors (who are mainly located in commune center), many producers agree to transport their bamboos to place along the national roads on their own. The sellers wait for district collectors' trucks to sell; both parties discuss and agree on the selling prices and payment is

made immediately. However, the farmers may face high risk if the bamboos are cut down but not saleable.

III. Obstacles and challenges

- Input supply:

+ There is only one method of seed plantation, which is to extract from matured bamboo gardens. The extraction requires many labor work and will affect the quality of the seeds as well as the entire garden where the seeds are taken from.

+ Difficult inter-village and inter-commune transportation hinders the reconciliation of new seeds among the villages.

- Production:

+ The existing matured bamboo gardens are still unable to meet the requirement on quality and quantity of seeds for new plantation under the province's bamboo development project.

+ Many households only participate in the project with reluctance just to receive immediate financial supports rather than for their real needs, which can downgrade the quality of bamboo garden in the future.

+ Besides bamboo seeds, the farmers are not used to using other materials to care for the trees. Though the farmers do not have to spend money on plant seeds, they also cannot select quality ones.

+ Difficult transportation causes obstacles to information and product exchanges between the producers themselves and with the collectors. Many bamboo gardens due for harvest were not sold due to low selling price and too high labor consumption.

+ The farmers' unreasonable exploitation method has also affected the quality of the bamboos in future.

- Procurement:

+ There are only collectors to buy bamboos from producers with verbal agreement, which is unfair to the sellers, especially the poor, in price negotiation.

+ Due to large area, difficult transportation and limited number of buyers, the producers do not know whom to sell their products to.

+ The processing company's procurement arrangement is not reasonable.

- Institutional and policy environment:

Directive No. 17/2003/CT-UB by the provincial people's committee prohibiting individual traders from competing with Cao Bang Bamboo Processing and Exporting

Company in purchasing bamboos ensures the implementation of their contracts with the farmers.

IV. Recommendations

1. Setting up procurements points and small paths near the plantation areas

The biggest difficulty now is in transporting the bamboos to procurement places near the roads. As such, in order to solve the problem it is necessary to assist in setting up procurement points that can meet both conditions of convenient transportation from production areas and being near roads.

Such procurement points can be set up on the small road linking the above 2 locations. It is necessary to review the current procurement points and consider setting up new ones that can satisfy the above conditions.

The difficult areas where the above recommendation can be implemented include Thanh Long and Yen Son communes (Thong Nong district), Vu Nong, Ca Thanh, Yen Lac communes (Trung Khanh district).

2. Establishing multi-function farmer groups in coordination with improving capacity for consumption actors

According to initial assessment, there is only one major bamboo processing actor which is Cao Bang Bamboo Processing and Exporting Company in Cai Bang town. The input for this actor is entirely raw materials without any semi-processing. As such, it is necessary to enhance its capacity for product diversification and sustainable development. In order to help them expand consumption market, the company needs to receive supports in advertising, promotion and product introduction activities to both local and foreign consumers.

There can be some experimental projects based on the cooperation between the company and planting farmers in which the latter will play a more developed role beyond their raw material production like at present.

→ Establishing farmer groups with other functions besides production like procurement, semi-processing and supply of products to processing company.

→ Technical training to farmer groups in new functions like procurement or semi-processing.

→ Training to enhance their capacity in group organization and management.

3. Improving quality of material

As the quality requirement for bamboo products is increasing (e.g. big, long and consistent size), it is necessary to have a consistent production procedures for all the districts in the province. The best solution is through information exchange among farmer groups in production techniques and providing technical training on centralized production for the planting farmers in each village. Besides, establishing farmer groups will also help provide sufficient information on selling prices to each member of the group.

- Cao Bang province still continues its bamboo plantation project from now until 2020 with high requirement for plant seed (at least 25,000 roots for each year). In order to have quality bamboo gardens in the future, it is necessary to select and develop quality seed production gardens right in each commune or even each village; to set up farmer groups specializing in providing plant seeds in the locality with each member members trained in seed cultivation techniques. It is noted that the seed suppliers in the communes still apply the previous cultivation habit and lack of specialized equipment in seed extraction.

4. Setting up market information system in the value chain

The lack of thorough transmission of information on processing company's procurement price to producers has enabled collectors to squeeze the producers' selling prices. In order to solve this problem, it is necessary to set up a system on price information at some major production and procurement points in the province to provide sufficient and accurate information to the actors.