

**MA&D CASE STUDY  
OF VILLAGES IN THE BUFFER ZONE  
OF VU QUANG NATURE RESERVE**

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## 1. INTRODUCTION

The national afforestation and poverty alleviation programs for the mountainous areas as well as the projects of establishment of National Parks and Nature Reserves have been implemented now for several decades throughout the country. In these programs, the improvement of the living standard of the population has been closely linked to sustainable development and environmental conservation. Achievements have been obtained and shortcomings have also become apparent. Among the shortcomings, farmers were supported to grow products that had no market, or products for which the market price was too low to pay back the investment. Also, some tree species were discovered to be environmentally harmful only at a late stage. These shortcomings reduced the effectiveness of the programs.

Market analysis and Development (MA&D) is an internationally recognized methodology that has been widely applied for its ability to safeguard social welfare and environmental sustainability. The generic MA&D consists of 3 phases: 1) assessing the existing situation, 2) selecting the products and identifying the potential markets, 3) planning the enterprise and market development.

In this case we applied a modified form of MA&D to suit the socioeconomic context of the buffer zone of Vu Quang Nature Reserve. The application encompassed the first two phases of MA&D with the following steps:

- Diagnosis of households economies, their problems and strategies
- Diagnosis of the conservation threats to the protected area environment
- Analysis of these two aspects in order to identify a development strategy to address both conservation concerns and the socioeconomic needs of the people
- Selecting the potential products for the areas
- Market channel survey and analysis, and finally
- Recommendations for product development

The logic of sustainable NTFP use unites the Nature Reserve and local households under a common goal. NTFPs are used for household subsistence and also for cash. Since NTFPs are an important part of the household economy, the households depend upon them for their existence and development and, therefore, should not exhaust this resource. This coincides with and reinforces the objective of the Nature Reserve. Therefore, in order to achieve its own objective the Nature Reserve should assist farmers to solve their livelihood problems and manage the NTFP resources sustainably. This logic shows the importance of close collaboration among the Management Board of the Nature Reserve, the local administrative authorities and the people to find a strategy to ensure sustainable management of NTFP resources.

This report on strategy analysis and development planning is based on findings gathered during a mission to Vu Quang, Ha Tinh, Vinh, Hanoi and Thai Binh undertaken by the Marketing team (Le Thi Phi and Nguyen Van Duong) of the Non-timber Forest Products Research Center from 20 March to 7 April 2000. The trip Itinerary is given in Annex 1

## 2. FINDINGS

### 2.1 Son Kim Commune

Son Kim is a commune with 6568 people of 1458 households spread over a large area along Road 8 and adjacent to Vu Quang Nature Reserve. The agricultural land of commune is very limited, with only 102 m<sup>2</sup> of paddy land per capita and 228 m<sup>2</sup> of groundnut-bean-maize per capita. From this figure it is easy to understand that Son Kim people can not be self-sufficient in foodstuff. In the

past the forest was an important source of income, providing up to 50-60% of household income, as estimated by the key informants. Construction of National Road 8 increased forest exploitation and at the same time off-farm activities were augmented. With the closing of the forest and increased trading with the neighbor Laos through the border gate Cau Treo, more people are able to find jobs outside their farm. As a result, most households living along Road 8 no longer go to the forest for cash products. However, people living a bit far from roads and adjacent to the forest continue to depend on it, but to a lesser extent than before.

#### *Household economy and role of NTFPs*

Village 4 was selected for survey as it is located adjacent to Vu Quang Nature Reserve, far from road 8 around 3 km and inaccessible by car and is even difficult for bicycles (particular in wet season) because of river and streams. Twelve ha of agriculture land can not produce sufficient food for 441 people of 86 families and very few people are involved in off-farm activities, therefore many households are still heavily dependent on the forest.

In the table the income from forest extraction is only 12,2 %, but the real figure is much higher because the reported amount does not include the income from banned activities like hunting, logging, etc. According to the results of household ranking in terms of forest dependency, 79% of the households harvest forest products for cash and 23.5% of these are heavily dependent on these products (see table 1). The key informants could not estimate the value of the exploited products that are banned.

#### *Logging*

For the last two years the ban on logging has been enforced and trading on timbers strictly forbidden. The farmers can not sell timbers and yet evidence that they are doing so is obvious everywhere: timbers of grade A are available on both sides of the village road, in yards, in gardens, etc.

The farmers are not allowed to chop trees for commercial purpose, but they can use them for house construction, stable, fencing and firewood. In the village 96% of houses have walls constructed of wood. The amount of wood used for fencing is quite big.

#### *Fuelwood.*

People do not use bushes and branches for cooking and alcohol making. Big timbers of good quality are usually used because of higher energy efficiency. Most of families make alcohol not for sale, but for household consumption and for pig raising. The amount of wood used by each family is estimated by key informants around 25-30 kg/day and from this figure it is easy to calculate the quantity of timber used by village per year (800-900 tons).

Table 1. Average contribution to the household income from different sources in Village 4, Son Kim commune, Huong son district (household size - 5.13 people)

Source of income	Estimated Income per Household (VND)	Percentage of Total Household Income	Rank
<b>Agriculture</b>			
• Paddy rice	593.000		
• Groundnut	280.000		
• Beans	186.000		
• Maize	82.000		
• Cassava	100.000	16,8	3
• Sweet potato	145.000		

Total	1.386.000		
<b>Animal Husbandry</b>			
• Buffalo & cattle	300.000		
• Pigs	900.000		
• Dear raising	280.000		
• chicken & duck	660.000	32,7	1
• Fish raising	553.000		
Total	2.698.000		
<b>Horticulture</b>			
• fruits, tea, wood, NTFPs	1.600.000		
• vegetables	900.000	30,3	2
Total	2.500.000		
<b>NTFPs</b>			
Firewood	600.000		
• NTFPs (rattan, herbs . . )	320.000		
• Honey	40.000		
• Logging	48.000		
Total	1.008.000	12,2	4
<b>Other income source</b>			
• Salary, pension	308.000	8	5
• Petty trading, hired labor	350.000		
Total	658.000		
<b>Grant Total</b>	<b>8.250.000</b>	<b>100,0</b>	

## Hunting

If previously hunting was the second after logging in term of income generation now it becomes the first since the later has been strictly banned. In the village, there are only 18 households not involved in this activity. Most of people go on hunting only during leisure time, however, 9 households go hunting around year. In the past, the hunter used both gun and traps, now the gun is on ban and the latter is dominant. One can find traps in kitchen or storing house of most households. The villagers often form the hunting groups of 4-5 people and stay in the forest for 2-5 weeks. When the big animals are trapped, it takes them some time whole day to bring the animal to the village and the kill may begin to decay. The civets and wild chicken are only for household consumption. Porcupine, turtles, pigs, deer, reptiles, etc. are mainly for market. In the local market, it is easy to buy meat of wild pig in any restaurant with a price of 40,000 dong/kg. Deer, pangoline, gold turtles, other reptiles and porcupine are very expensive and have their destination in the big cities of Vietnam or China.

We met a hunter with a living iguana that had just been trapped and that weighed 2.5 kg. When he was asked how much he could get for this animal, the answer was: "the common price is 120,000 dong /kg for iguana with a weight more than 1 kg. Iguanas of less than 1kg are priced at 100,000 dong/kg." So for this small animal he would get 300,000 dong, an amount that equals the monthly salary of a medium-ranked government official. It was impossible for key informants to estimate the income from hunting sources, since hunters sometimes get nothing for several months. However, when they have good luck they get millions of dong or even an amount equal to what they could earn from their labour for tens years. Most hunters look for that big luck and some of them are ready to go even at risk of their life. When the hunters are young and strong they go into the deep forest for wildlife of high value, and once they get old they trap small animals like civets, birds, and chickens in the nearby forest. This type of hunting is very popular and is an additional source of cash and subsistence income. The trained birds can be sold for 50,000 - 250,000 dong, depending on their quality.

Some wildlife like bear and gold turtle are becoming rare. According to the village information, for the past several years no hunter in Village 4 got one of these species. If in Vu Quang people complained of the damage caused by wild birds to their domestic chicken, in Son Kim, where wild poultry is a good income source, no such thing happened. That fact strongly suggests that the population of birds is diminishing.

## *Rattan*

Currently it is one of the sources of cash income for the poor families. The rattan collectors are mainly women since this job is considered not manly. Last year when Truong Son Forestry Cooperative exploited 200 ton of rattan, women were the main labour source. The rattan collected from the non-privately owned forest can be sold for 1,200 dong/kg. In Truong Son forest they collected the type of rattan called may and sold it to the Cooperative at the price of 800 dong/kg. The slow-regenerated species like chu ca, treo doi and song are not available due to heavy exploitation during the last several decades. May and heo - two fast regenerating species are still available. The quality of these species is also better than in Huong Minh and in Hoa Hai communes. Women's labour can earn 20,000 dong/day. According to the rattan trader, every month in the agricultural leisure season he is able to buy 40 tons of rattan. However, during harvesting time the amount is much lower. Currently, he buys only may. Although the market for heo is big he can not compete with other areas due to high cost of local labour.

## *Medicinal herbs*

As reported by Mr. Manh, a herbalist and herb trade in Son Kim commune, about 120 species of medicinal herbs occur in the forest and many of these resources are in good condition and could be

saleable, but he could not collect them due to the high labour cost in the area. Sometimes he organizes the collection of herbs without any profit just to exchange for herbs from outside that he needs in his practice as a herbalist. Currently, he purchases 15 species of herbs and sells the products to Vinh, Ha Tinh, Ha Noi. He also buys products from Laos like amomum, scale of pangolin, etc. The price he offers to the herb harvesters is higher than in Hoa Hai and every year he manages to collect several hundreds ton of herbs. The harvesters of medicinal herbs are only women and the collection is good during the agricultural leisure time. Often he gets big orders but cannot mobilize sufficient labour to gather them.

#### *Other NTFPs*

In the past eaglewood was available in Vu Quang Nature Reserve and the forests nearby, but now the resource of this high value product has run out. Since then, villagers have gone to the forests of Laos to search for eaglewood. This is a very dangerous and high risk activity. It was reported that two years ago two hunters for eaglewood from Village 4 were killed in Lao forests.

Rush leaves, yams and brown tubers are also an additional income source for poor women. Rush leaves are harvested only once a year, on the occasion of the Tet holiday. Other products are gathered year-round, whenever they have time. Part is for market and part is for family use (e.g. yam). To collect these products the women do not have to go far; however, earnings are limited (around 15,000 dong/day). Although these products are less available than previously, they are more numerous than in Hoa Hai and Huong Minh and they can be sold at a higher price locally to traders who supply other markets (1 kg of yam sells for 5000 dong).

The market of palm leaves is very limited but it is an important product in terms of family subsistence. This is not reflected in table on income sources. Besides that more than 20% of houses in the village are roofed by palm leaves, and all the households use this material for kitchens and stables. That explains why every house grows palm as a fence material around their gardens.

#### *Management of forest land and awareness of conservation*

According to the chairman of Son Kim commune, most of forest land has been allocated. Five forestry cooperatives have been established. Truong Son cooperative was the first one formed (December, 1997). We interviewed the manager of the cooperative, its four members and 12 people in Village 4 to which the forest belonged. Through the interview it is clear:

- The cooperative has use rights on 757 ha of forest in adjacent to Village It has 30 members: 11 members live in Village 4, 3 members are not Son Kim residents and 16 members are from different villages (Son Kim has 26 villages)
- To have membership each household paid 3,500,000 dong to become a shareholder
- Two years after establishment of the cooperative the forest regenerates fast
- In 1999, the cooperative extracted 200 tons of rattan and this year it is trying to get permission of Forest Protection Department for thinning timbers and harvest residue wood. All profit from the extraction of forest was and in near future will be invested back to the forest (road construction, fruit and forest tree planting along the roads, etc.). It is planned that shareholders will get profit in the second five-year plan.
- The cooperative got support from the Vu Quang project of 20,000,000 dong to buy tree seedlings and is going to get support from government for a small hydraulic power installation and other investments.
- The forest currently is effectively protected and sustainably harvested.

Those in village 4 who are not members of the cooperative complained that the share price for membership was too high and that it was beyond the capacity of the most of households. Only the

better-off and the local authority circle were members of the cooperative.

Village 4 had only 137 ha of forest left, meanwhile there were 86 families. All of them are aware of the importance of forest to their basic needs and expressed their desire to be a member of the new cooperative that was going to be established under leadership of the Veterans' Association to manage the left area of the village. They also expressed their fear of share the size which might be too big for their capacity.

The awareness of farmers in forest planting is high. Although the farmers did not get any support from afforestation programs, they bought tree seedlings from all sources they could with high cost (700 dong/cinnamon seedling, 300 dong per doi timber seedling) or produced themselves to plant in their farms. Some households with large hillside allocations sold their cattle and motorbike to invest in agroforestry gardens. Their difficulty is deciding what trees to grow and where to get seedlings. Several years ago, many households invested in planting lemon trees. Subsequently, a drastic decrease in the market price for lemons has disappointed them and some of them are shifting to growing cinnamon because recently a few households could sell cinnamon at a high price. In general, identification of right products to develop at present is a real concern and cause of restlessness among the Son Kim people.

#### *Marketing initiative*

Although Village 4 is located close to the national road and enjoys better communication and opportunities for intensive trading with Laos through the border gate, the local people lack marketing initiative. The traders often come to each household to find out what they can buy and advise farmers to grow this or that product. When some villagers are able to sell a certain product at a good price, the others will rush to cultivate that one (lemon and cinnamon are examples). This way of exchanging marketing information has existed for the past decade. The list of village priorities for products given in Table 7 below reflects the resulting attitudes and does not necessarily represent the best market judgement.

## **2.2 Vu Quang commune**

Vu Quang is located inside the Nature Reserve with 340 families and 1700 people concentrated in 5 villages. Most of Vu Quang people came from Duc Tho district according to the national resettlement program in 1968. As the key informants estimated, in the past more than half of household income was obtained from the forest. Since the ban on forest product exploitation has been launched, people of this commune live mainly by agriculture products. Similar to Son Kim, the paddy field is small (~ 176 m<sup>2</sup>/head). The commune is not self-sufficient in rice, and people depend on selling of the groundnut and sugarcane cash crops to buy rice. The market system in the commune is not as developed as in Son Kim and the barter system is prevalent. The farmers usually exchange groundnut and molasses and beans for fertilisers, rice.

The bad road and high fees to pass the Huong Dai ferry and to enter the frontier area (pay to the Frontier Post) increase the cost of goods to Vu Quang (farmers have to pay 50% more for fertilizers and insecticide than people in the plains) and lower the price that can be received for its products. In comparing to the other three communes, the income of the Vu Quang people is lowest. Due to the hardship, more than one third of families migrated to the South. One of the richest remaining families of Tung Quang village has just sold its house with 40 cattle in order to move to Tay Nguyen High Plateau. Those who still stay in Vu Quang are too poor to leave the place.

#### *Household economy and role of NTFPs*

The village surveyed in Vu Quang (Tung Quang Village) is located close to the Forest Protection Station and enjoys better transportation conditions than the other four villages. The income of the households estimated by key informants is given in Table 2.

Agricultural crops and animal husbandry are the main income sources. Since last year the price of molasses dropped drastically (20 kg of molasses is exchanged for 10 kg of rice) and people face great difficulties. More than half of the families in Tung Quang village suffer from food shortage: 20% of families are short of food for 4-8 month and 31% -from 1-4 months. Those that are considered as the better-off and have sufficient food are mainly retired or family of killed or invalid soldiers.

Animal husbandry is the second source of income. Chickens and pigs are raised mainly to meet household needs and some surplus is sold in the commune market, which gathers every two days for a few hours. Cattle are for ploughing and for cash. They are the biggest item of family property and the main criteria for wealth ranking. However, cattle are raised at random in the commune and they cause heavy damage to the agricultural crops. Each household uses a lot of labour to construct fencing to protect their fields. When the key informants were asked to make comparisons between the profit gained from selling cattle and the damage caused to agriculture crops by them, the answer was: "the better off have profit and the poor have losses".

Again estimation of income from forest extraction is not an easy task for the key informants, as some of these products are illegal while others are just for household use and they do not know what price these products would fetch on the market.

Table 2. Average contribution to the household income from different sources in Tung Quang village, Vu Quang commune (family size ~ 4.9 people)

Source of income	Estimated Income per Household (VND)	Percentage of Total Household Income	Rank
<b>Agriculture</b>			
• Paddy rice	40.000		
• Groundnut	1.000.000		
• Beans	175.000		
• Molasses	750.000		
Total	1.965.000	35,6	1
<b>Animal Husbandry</b>			
• Buffalo & cattle	800.000		
• Pigs	450.000		
• Chicken & duck	440.000		
Total	1.690.000	30,6	2
<b>Horticulture</b>			
• Fruit trees	300.000		
• Vegetables, tea	547.000		
Total	847.000	15,3	3
<b>NTFPs</b>			
• Firewood	600.000		
• Honey	80.000		
• Fishing	80.000		
Total	760.000	13,8	4
<b>Other income source</b>			5
• Salary, pension	262.000		
Total	262.000	4,7	
<b>Grand Total</b>	<b>5.524.000</b>	<b>100,0</b>	

Here we got conflicting information from different sources. According to the cadastral officer of Vu Quang commune, 1/3 of households go on logging. However, the key informants and the interviewed households said that they did not go to the forest for timber any more because they could not sell the products. However, the amount of wood used for other needs is enormous. Apart from the wood used for cooking by each family as estimated on the table, the amount of wood used for making molasses and fencing is colossal and its value is not included in the table. To produce 1 kg of molasses the farmers use 4 kg of good quality wood. Last year, although the sugarcane crop failed, still on average each households produced 500 kg of molasses. That means, in total, 55 families used 110 m<sup>3</sup> of wood only to make molasses. The quantity of wood used for fencing is the biggest that is estimated by the key informants around 10 m<sup>3</sup>. To fence their fields and gardens the farmers chop down trees of 15-20 cm in diameter. The farmers are aware of the damage caused by them to the forest but they also understand that the ban applies only to the collection of wood for commercial purpose but not to wood for "household needs."

### *Hunting*

According to the key informants around 1/10 households go on hunting and because the village is close to the Forest Protection Station and Frontier Station, so the hunting become strictly illegal. The farmers said they heard a pangoline or porcupine was trapped, but they did not see themselves. However, the complaint of the key informants of the damage caused by wild birds and civets to domestic chicken (that is one of the factor limiting poultry development of the villagers) shows that the fauna of wild animals in Vu Quang is much higher than in the buffer zone.

### *Others NTFPs*

The material used for house construction is another material that is not easy to estimate in terms of its in-kind contribution to household income. Meanwhile 69% of houses in the village are roofed by palm leaves with bamboo walls. 31% of houses have tile roofs but walls of wood or bamboo. All kitchen and stables are constructed from wood, bamboo and palm leaves.

There are no collectors and no trading of NTFPs like rattan, hat leaves, medicinal herbs, and bamboo. The rattan resource is good. May and heo of good quality are available in the forest very close to the people's houses.

The leaves used for making hats are also plentiful. Previously, it one of the income sources of the villagers. Medicinal herbs are available but, as the villagers said, they did not gather them because there was no buyer. However, we met three young men from the plains area of 90 km away, who stayed in the forest for 3 days to gather a herb called kim tuyen. They would sell the herb in fresh for 12.000 dong/ kg. So for 4 days (including travelling) they could earn about 300.000 dong/each. According to their information, this species became very rare and they collected in the area close to Laos. The Tung Quang villagers said that in the past, some traders placed orders for this herb, but for the past several years no one has come to buy it.

### *Forest management and conservation awareness*

As reported by the commune cadastral officer, there is 4,500 ha of forest under commune management. The farmers are encouraged to receive land to establish agroforestry farms. However, no farmer cares about forest land ownership. The reason cited for this is that they can not sell any kind of forest product because of the ban enforced by the Vu Quang Nature Reserve.

The attitude of forest conservation of the people of Vu Quang is different from that of the other communes. None of the people interviewed in Vu Quang care about conservation issues. They take from the forest whatever they are able to get for house subsistence and do not see the need to use

these materials economically. They are interested only in fruit tree planting and agricultural products. Due to sharp decrease of molasses price they are trying hard to find the alternative to sugarcane.

### *Marketing initiative and skill*

As mentioned above, Vu Quang commune is isolated and the farmers have poor information on pricing of products. Because most of households are short of food, the common way of exchanging products is to borrow rice, fertilizers, etc. from the traders and pay off these debts with groundnuts, beans or molasses when the harvesting time comes. Few traders come to Vu Quang and this barter system has been maintained for years. One key informant, who seemed to be the most creative and one of the better-off residents of Tung Quang village, has tried to grow different products for commercial purposes. Last year, he produced 400 kg of pumpkin but failed to sell them. Now he is thinking of growing pepper and coffee. So in Vu Quang as in Son Kim, finding the right product to grow is the biggest concern of the farmers.

## **2.3 Hoa Hai Commune**

As with most of the people in the buffer zone, in the past the livelihood of the Hoa Hai people was based mainly on forest exploitation, namely logging, hunting and rattan collection. The ban on logging and hunting and the exhaustion of the rattan resource have forced people to invest more in agricultural crops. Hoa Hai has better advantage than the other communes in that it enjoys a larger area of paddy fields. The commune can produce sufficient food for its population and even some surplus for market. More and more households have come to rely only on their agriculture crops, horticulture and animal husbandry. The forest is now just a source of fuelwood and a few other household subsistence goods.

### *Household income and role of NTFPs*

The household income sources analysis was carried out with the key informants of Village 5 of Hoa Hai commune. The result of exercise is given Table 3.

The data on NTFP income in Table 3 does not reflect the real situation because it does not include the income from logging and hunting, which are strictly illegal.

### *Logging*

The trading of Class A timber is strictly banned. Class B timber is not so strictly controlled and it can be marketed if it is produced in gardens. There is a man in the village involved in timber trading, not regularly, but only when he gets an order. The amount of income derived from his trading is not known. According to the key informants, logging and illegal trading in timber is carried on through road and river transport. However, few people in the village go on logging because this is very hard work and the risk of being caught is high. Once they are caught they may lose their buffalo (used to carry the timber). The other reason is that the Forest Protection Station is located in the village.

Table 3. Average contribution to the household income from different sources in Village 5 (family size - 6.4 people)

Source of income	Estimated Income per Household (VND)	Percentage of Total Household Income	Rank
<b>Agriculture</b>			
• Paddy rice	2.000.000		
• Groundnut	400.000		
	200.000		

• Beans, cassava, sweet potato Total	2.600.000	34,3	2
<b>Animal Husbandry</b>			
• Buffalo & cattle	1.300.000		
• Pigs	1.000.000	35,57	1
• Chicken & duck	350.000		
• Fish raising	50.000		
Total	2.700.000		
<b>Horticulture</b>			
• Fruit trees	300.000		
• Vegetables, tea, spices	540.000	11,06	3
Total	840.000		
<b>NTFPs</b>			
• Firewood	600.000		
• Honey	60.000		
• Medicinal herbs, bamboo	90.000	9,9	4
Total	750.000		
<b>Other income source</b>	620.000		
• Salary, pension	80.000		
• hired labour	700.000	9,2	5
Total			
<b>Grand Total</b>	<b>7.590.000</b>	<b>100,0</b>	

### *Fuelwood*

Firewood is gathered only for household use. In this commune also people chop trees of 15-20 cm in diameter and use the buffalo to bring them home. When we interviewed a staff member of the Forest Protection Station on this issue, his explanation was that only trees belonging to timber Class C were allowed to be harvest for firewood. It is doubtful that good control on the activity can be applied. The amount of wood used for household cooking is quite big (about 250-300 m<sup>3</sup>/year). Most households make alcohol for household use and use the waste for raising pigs.

### *Hunting*

The income from hunting is also not clear. Everybody said that hunting was going on and knew exactly the price of each type of wildlife species. The game meat (wild pig and deer) was available in the commune market, but the traders refused to tell the name of hunters. According to them, some animals like gold turtle and bear have become very scarce, particular the gold turtle because of its high price in the market (20 million dong/kg).

### *Rattan , medicinal herbs and others NTFPs*

Currently in the village no people collect rattan for sale, but only for household needs in small quantity. The reason given by them was quite reasonable: the rattan resource is very limited, they can earn only about 10,000 dong/day, and it is hard work. They prefer to work on their fields or somewhere else (some young people work seasonally in Tay Nguyen High Plato as hired labour).

Although herbs are available in the forest, and some species are there in good quantity (like thien nien kien), people in the Village 5 do not collect herbs, saying that there are no buyers. In responding to a question about whether rattan and other NTFPs are now in good supply since they

are not being harvested, the answer was negative. Reportedly the resource is shrinking day by day because it is overexploited by people from other areas. Following up on this information we went to Tan Huong village, Phuc Dong commune. This village is the neighbor of Village 11 in Hoa Hai commune and there was a time when the village was not administered by either of these two communes. Tan Huong villagers originated from Duc Tho and came to this area 80 years ago to form a bamboo mat cooperative in accordance with a government resettlement program. By the end of decade of the eighties the cooperative had collapsed because there was no market for bamboo mats. Unfortunately, the village has no agriculture land so the thirty nine families of the village continued to extract forest products for their living. Depending on the family labour force and skill, they harvest from the forest whatever they can. The women usually gather may, heo, nua and herbs. Men are involved in the work with higher income but more energy-required like logging, hunting.

Rattan species like song, cheo doi, chu ca do not occur. Heo and may are collected by the villagers when they get the advance from the traders. According to the middleman, he buys heo at a price of 550 dong/kg and may at 1200 dong/kg. The quality of rattan in Hoa Hai is inferior to other areas because it is often harvested immature.

Tan Huong people harvest nua and sell to traders from Duc Tho district. When the traders come, all the people in the village go to the forest and stay there for 2-3 days. For the nua of big size they have to go deeper into the forest. A good piece of nua can be sold for 700 dong. Although nua is a very fast regenerating species, resources of good quality nua are decreasing due to overexploitation and cattle raising.

#### *Medicinal herbs*

There is one herbalist in the commune and he is also the herb trader. He is buying 10 species of herbs and selling them in Ha Tinh town market. According to his information, the market of herbs is limited and the price of many herbs is very low, so the farmers do not want to collect medicinal herbs. Sometimes when he gets a big order from the town, people are too busy to go to the forest and when the people have time to gather herbs, there is no demand. In general, most of herb gatherers are people from Tan Huong village. The quantity of harvested herbs are not high. For example the largest amount of Thien nien kien he could buy was 400 kg. The price offered to farmers was very low, 2000 dong/kg for dry thien nien kien.

#### *Forest management of the commune and conservation awareness of the people*

There is no policy on forest management. The commune forest area was 15,000 ha. One part of this now belongs to Vu Quang Nature Reserve, the remained is under the ownership of the commune and Huong Khe Forestry Enterprise. The local people are not clear about the location of the border between the three owners.

According to the Vice chairman of the commune, there is a policy to allocate this forest land to households. Those that want to have land need only submit a management plan in order to have the land allocated to them, but reportedly most of farmers do not want to have land. However, the key informants and the households interviewed gave a different picture. They expressed a strong desire to have their own forest land to protect for regeneration. They also expressed doubts about the forest management of commune authorities. As reported by them, some of the leaders of the commune together with people outside of Hoa Hai who have got land and do nothing with it. They try to get forest land and wait for the government investment. Meanwhile, the farmers expect the authority to support them in land allocation and legislation for effective protection.

The forest land allocation and forest planting in village 3 is an example that people in Village 5 would like to follow. They need some one pioneer who can guide them like Mr. Tien of village 3. Under the leadership of Mr. Tien, who was the first in the commune to claim forest land ownership,

63 village households were allocated 155 ha of hill land and have established agroforestry gardens. These households received support from Vu Quang project to produce seedlings and to plant different species of forest trees.

#### *Marketing initiative and skill*

Similar to the people in Son Kim, Hoa Hai people produce only products the traders come and ask for. For the NTFPs they go harvesting if they get some advance from traders. People in Hoa Hai often get a lower price for the same products than the people in Son Kim. The market system is less developed than in the latter case and few traders come because of poor transportation infrastructure.

## **2.4 Huong Minh Commune**

The total area of the commune is 5,360 ha. After establishment of Vu Quang Nature Reserve there was only around 1000 ha under management of the commune. The agriculture land in the whole commune is small, average 500 m<sup>2</sup>/head (both paddy and groundnut-bean field). The people live concentrated along the river and most of families have very tiny gardens. Off-farm activities have not developed and the people continue to rely very much on forest both for cash and for subsistence.

#### *Household economy and role of NTFPs*

The result of different income source analysis by the key informants in Village 5 of Huong Minh commune is on table 4.

As the other three communes, in the past people in Huong Minh earned their living mainly by exploiting the forest (logging and hunting). As reported by the head of Village 5 his asset was accumulated from logging. Since the ban on logging and hunting the agriculture has become main source of income and due to limited area of cultivated land and very small garden more than half of population suffer from shortage of food: 37,7% are in shortage of 1-3 months, 23,2% are in short 3-6 months.

After the agricultural crops and husbandry, forest is an important source of income for the poor people. The result of forest dependent household ranking of the key informants showed that all households harvest fuelwood and others products for their daily need, 50,7% go to forest for cash product during leisure time and 17,4% households go to forest around year.

#### *Logging*

As mentioned above, logging was most important cash source in the past, now as reported by the key informants and households interviewed is very little. This is very hard and risky work. Once they are caught they will lose their buffalo that is a big property of the family. The other information source said that illegal logging was going on, but in small scale.

#### *Hunting*

Hunting is going on, although not as much as in Hoa Hai and in Son Kim. There is not reported to be any game meat in the commune market and, as the people said, there are not many villagers who have good skill in hunting.

#### *Rattan and Bamboo*

May, Heo and Nua are three major products for commercial purposes. These are quickly regenerating species; however, due to very heavy exploitation they have become scarce. The quality of May and Heo is not as good as in Son Kim. The harvesters sell May and Heo at a cheaper price

than in Son Kim and Hoa Hai: 400dong/kg for Heo and 1000 dong/kg for May. May and Heo are sold to the middleman in the commune and from there to Huong Khe town. A labourer with good health can earn 10,000-12,000 dong/day. The high value rattans like Song and Chu Ca are reported to be not available in the area any more. Bamboo, mainly Nua, is harvested to exchange for goods with the traders from Duc Tho.

Table 4. Average contribution to the household income from different sources in Village 5 (family size - 4,8)

Source of income	Estimated Income per Household (VND)	Percentage of Total Household Income	Rank
<b>Agriculture</b> <ul style="list-style-type: none"> <li>• Paddy rice</li> <li>• Groundnut</li> <li>• Beans</li> <li>• Cassava, sweet potato, maize</li> </ul> Total	1.300.000 670.000 190.000 95.000 <b>2.225.000</b>	39	1
<b>Animal Husbandry</b> <ul style="list-style-type: none"> <li>• Buffalo &amp; cattle</li> <li>• Pigs</li> <li>• chicken &amp; duck</li> </ul> Total	800.000 530.000 380.000 <b>1.710.000</b>	29,6	2
<b>Horticulture</b> <ul style="list-style-type: none"> <li>• Vegetables, fruit trees</li> <li>• Palm leaves</li> </ul> Total	430.000 120.000 <b>450.000</b>	9,5	4
<b>NTFPs</b> <ul style="list-style-type: none"> <li>• Firewood for house use</li> <li>• Firewood for sale</li> <li>• Rattan</li> <li>• Bamboo (nua)</li> </ul> Total	575.000 180.000 105.000 38.000 <b>890.000</b>	15,4	3
<b>Other income source</b> <ul style="list-style-type: none"> <li>• Salary, pension</li> <li>• Six people in village work seasonally in the south. Income is unknown</li> </ul> Total	380.000 380.000	6,5	5
<b>Grant Total</b>	<b>5.785.000</b>	<b>100,0</b>	

### *Fuelwood*

In Huong Minh the ban on the use of timber for fuel has been strengthened. People use branches and bushes as fuelwood for household need and also to exchange for goods for basic needs

(kerosene, salt, fish sauce, etc.). If the value of the good exchanged is converted into money their earning would be just around 7, 000 dong/day and only women are involved in this job. Palm trees seem to have a more important role in the life of the Huong Minh people than in the other areas in term of cash as well as household subsistence. Most houses in the village are constructed of bamboo and palm leaves and this product also is saleable.

The barter system is very common in the commune. Most of the harvested NTFPs are exchanged for goods of basic needs with people from Duc Tho district, and women are the dominant dealers.

There are few traders and they have to accept whatever the traders offer. There is no choice. No trader buys their products for money and they think that it is also convenient for them to exchange for goods for the daily needs of the family.

#### *Forest management and conservation awareness*

As the chairman informed, the commune is separated into two parts. The barren hill land on one side of the river that has been allocated to the households and the forest land adjacent to the Vu Quang Nature Reserve has not yet been allocated. The boundary between the Nature Reserve and commune is not clear.

The farmers are not satisfied on this issue, saying that it is declared to be forest of Nature Reserve everywhere. Where is the forest boundary? They want to have their own land with clear rights, where they can have their labour input for long term investment and rights to their products. The Vu Quang Project has supported them in planting forest trees. However, the villagers think that the planting area for each family was very small (18 ha with participation of 48 household, or 0.38 ha/household), an amount that is not worth spending labour for protection. They prefer to have larger area to establish agroforestry farms. They also said that some species of tree seedlings provided by the project, like Muong Den, did not match their preference.

#### *Marketing skill and initiative*

No market and no buyers were the stories we heard everywhere. The medicinal herbs market exists in other communes but not in Huong Minh. People said that in the past traders came to buy La Khoi, but now that it was scarce nobody came to the village any more. Other herbs are available, but the villagers can not sell them. The market system in Huong Minh is something between Vu Quang and Hoa Hai. For the agricultural products people can sell for cash, but for NTFPs like fuelwood, bamboo, palm leaves, etc., they follow the barter system. It may be because their daily earnings are low (around 7000 dong/day). The people do not make any attempt to find a market for their products outside the commune.

### **3. STRATEGIC ANALYSIS AND DEVELOPMENT STRATEGY**

Through the investigations in the four communes the following threats to the Nature Reserve have been identified:

- Illegal trapping of wild animals for commercial purpose
- Chopping timbers for firewood and fencing
- Illegal logging for commercial purpose
- Over-exploitation of rattan and some medicinal plants for sale

In order to conserve the Nature Reserve, the income of the people should be ensured. The farmers are aware of the importance of the forest to their life. In their opinion, earning by forest product exploitation is very hard work and they prefer to have some on-farm activities with similar or even lower but stable income. The situation in Village 5 and Tan Huong shows this tendency very

clearly. People in Village 5 go to the forest to gather the products for household use, but only in leisure time. Tan Huong villagers harvest forest products year round for cash to buy rice and other needs. The Truong Son Forestry Cooperative is also an example. When the Cooperative extracted 200 tons of rattan, it used the labour not from its household members but mainly from poor households in village 4 and got a profit of 400 dong/kg of fresh May. The interviewed women who were involved in harvesting rattan for cooperatives said they earned more than going harvesting in non-owned forests because the rattan resource there was scarce and they had to go far and stay in forest 2-3 days.

On the other side, the people's awareness of nature conservation needs to be raised and closely linked with their rights and benefits from protection contribution. People in Vu Quang commune do not care about conservation and sustainable use of forest products, nor about planting of forest species because, as they report, they have no right to sell the products. If they can not sell for cash then they use the products for household needs and do not bother about efficiency. When they were asked to compare the money from selling molasses and groundnut with the value (if they could sell it) of wood used for making molasses and fencing the fields, their answer was that the latter would be much higher.

The ownership of forest land is one of the important conditions to the success of the sustainable management of forest. When the people were asked why they chopped down big trees for fuel the answers was similar everywhere: "If I do not cut the others will do." The competition in harvesting is resulting in poor quality of products (immature rattan, nua, etc.). The establishment of Truong Son Forestry Cooperative and its activities is a good example of the potential of regenerated forests. However, the lesson also to be drawn is that in future the poor households should not be excluded from the membership lists of the cooperatives. If this continues to happen, then when all forests have their owners, **Vu Quang Nature Reserve will be the target of exploitation by disadvantaged groups.**

The allocation of forest land to the farmers or to collectives should be done simultaneously with the setting-up of a system that indicates clear legal rights of the forest owners and their responsibilities. From the local authority side, it should be supervised so that any property violation is strictly punished. For the Vu Quang commune case, a special policy should be elaborated to support the people and enable them to live in peace with the forests and care about its conservation. For instance, the strict ban on extraction of rapidly regenerating products like hat leaves, May, Heo, medicinal herbs, etc. from forest allocated for village management should be modified.

Once the forest has been allocated, adequate assistance in the form of credit and instruction on techniques of sustainable management should be given to the farmers in order to bring regular income in the very near future.

Income generation and job creation should be diversified in accordance with the socio-economic and geographical conditions of each commune. NTFP development is one income source. However, it not reasonable to separate NTFP development from other products like timber, fruits and industrial plants in regenerated forests, homegardens and agroforestry farms because NTFPs are only a part of the combination of crops to be planted or managed. Therefore the development strategy for NTFPs should also encompass timber and fruit trees. Good combinations of NTFPs and timber and fruit trees should be identified in order to maximize the effectiveness of land use and environmental conservation; for example, which upper storey trees should be combined with which understorey plants (amomum, medicinal herbs, etc.). Crop diversification is also an important issue because it can reduce market risks for farmers. Attention should be paid to mix-intercropping of long term trees and short term crops so that the farmers have regular income to meet their urgent needs.

Unlike the households in the plains, people in Vu Quang buffer zone often have large gardens and very slightly sloping hillsides. However, the income from this source is too low. Support should be given to them to establish agroforestry farms and rehabilitate their low-efficiency gardens. For this

purpose, the farmers must be trained in techniques of seedling production and tree planting. As mentioned above, the farmers lack information on what to grow and where to get the planting materials, and they lack experience in cultivation. People in Son Kim produced doi tree seedlings to plant in their agroforestry gardens because they could easily find the seed in the forest nearby. Some people bought cinnamon seedlings at price 700dong/seedling, three times costlier than the common price. Information on planting techniques for each species is also urgently needed by the farmers. Due to lack experience, cinnamon and muong den survival rate were very low and performance of those that survived was poor. The situation of fruit seedlings was even worse. The farmers had difficulty in finding a trusty source of fruit tree seedling and they used to buy them from the vendors. That resulted in loss of their money (price of fruit tree seedlings were high), labour, confidence and enthusiasm.

The involvement of all people, particularly the poor, in development activities is another issue that needs to be focused on. There was some support to farmers from Extension, Poverty Alleviation and Afforestation Programs. However, in all surveyed villages very few households got the opportunity to participate and those tended to be the village cadres, people on pension, or better-off people. This happened in village 4 of Son Kim , in Tung Quang of Vu Quang and in Village 5 of Hoa Hai. In Son Kim , Truong Son Forestry Cooperative got 20,000,000 dong from Vu Quang Nature Reserve for forest tree planting, but there were no poor farmers among the shareholders of this cooperative. In all the surveyed communes, the issue of equality for disadvantaged people was not adequately addressed.

High Growth rate of population and underemployment is an impact to the forest. Value added activities like processing and handicraft production could be organized to provide alternative income source to people, particularly those in Tan Huong village. Through an interview with the vice director of Thai Binh Handicraft Export Company we found out that the company bought ready-made products for export from many areas like Yen Bai, Hung Yen, etc. We asked him whether the company was willing to send people to rural areas to train them in making products that would be sold to the company. His answer was positive and he said that it was better for the company to organize production in the raw material producing areas because that helped to reduce cost of labour and transportation. Cottage industry primary processing of herbs can solve problems of poor quality faced by herbs traders and provide income and jobs to people.

Improvement of marketing skill and initiative has a big potential to increase the income of the people and it also can have a positive impact on nature conservation. Too large a difference in herb prices offered by herb traders in Hoa Hai, Huong Khe town and Son Kim to the harvesters revealed weaknesses in the current market system. Similar situations are found in Vu Quang and Huong Minh communes. In order to improve the marketing information system and marketing initiative of people, some initial support from the Nature Reserve and local government authorities is needed.

Finally, law enforcement is an essential point. People go on hunting and trapping because of the need for income and also for pleasure. Effective measures to prevent this intensive activity need to be adopted. Improved enforcement action should be applied to the trade in logs and other products as well.

A summary of the proposed strategy for NTFPs and tree development is given in Table 5.

Table 5. Intervention strategy for addressing joint conservation and development objectives in the buffer zone of Vu Quang Nature Reserve.

<b>Strategy</b>	<b>Impact on household economies</b>	<b>Impact on conservation</b>
<p>Regeneration and sustainable management of forest</p> <ul style="list-style-type: none"> <li>• allocation of forest land to households or collectives to manage (focus to be on equality and participation of all the poor people)</li> <li>• legal system to be set up to ensure sustainable management of forests and long-term rights of farmers on its products</li> <li>• technical assistance to farmers to enrich degraded forests by semi-domesticated high value NTFPS and timber species</li> <li>• technical training to farmers on sustainable harvesting of rattan, bamboo, medicinal herbs . . .</li> </ul>	<p>Sustainability of income sources based on naturally growing plant resources</p>	<p>Sustainable harvesting replaces overexploitation</p>
<p>Expansion and intensification of homegardens and upland agroforestry farms to provide sustainable income to farmers</p> <ul style="list-style-type: none"> <li>• planting fruits trees of superior varieties in homegardens</li> <li>• planting of high value forest species for timbers (e.g, vang tam, lat, doi) and planting medicinal plants in the understoreys (amomum, etc.)</li> <li>• growing medicinal herbs (chi sac, cu mai, etc.) in agroforestry farms and rattan along field boundaries (for income and for field protection against cattle)</li> </ul>	<p>Increased income to households and economic growth through effective land use of homegardens and barren hillsides</p> <p>Increased income to poor people through use of improved varieties of fruit trees</p>	<p>Alleviation of negative conservation impacts by creating substitute income sources</p> <p>Increase the area of vegetative cover outside the Nature Reserve in order to buffer the local environment and against future population and economic growth</p>
<p>Establishment of mini-nurseries to produce seedlings to meet demand from the above activities through:</p> <ul style="list-style-type: none"> <li>• Providing training to farmers in nursery technique and management</li> <li>• Providing or supporting nursery owners in finding seeds or scions of good quality</li> <li>• Provide loans to farmers-nursery owners if it necessary</li> </ul>	<p>Increase income for the households through producing seedlings for commercial purpose</p> <p>Households have their own planting materials and save money to buy them in market</p>	<p>Assistance to conservation-oriented land use through provision of necessary inputs for sustainable production systems</p>
<p>Primary processing of rattan, bamboo and medicinal herbs</p>	<p>Creation of job opportunities to the poor people</p>	<p>Reduce pressure for demand of income of people on the</p>

<ul style="list-style-type: none"> <li>• Establishment of rattan and bamboo handicraft cooperative</li> <li>• Assisting households and local collectors in primary herb processing technology to upgrade quality and value of products</li> </ul>	<p>Increase income through valued-added processing and manufacturing activities</p>	<p>nature resources</p>
<p>Improve local marketing skill and infrastructure through:</p> <ul style="list-style-type: none"> <li>• establishment of marketing organisation and market information system</li> <li>• establishment of collection points, organization of transport and business training</li> </ul>	<p>Increase income potential and stability through better marketing of local products</p>	<p>Resource of products providing alternatives income will be better conserved</p>
<p>Control on logging and trapping of wild animals through:</p> <ul style="list-style-type: none"> <li>• Effective enforcement of ban on trading game meat in markets and restaurants</li> <li>• Effective enforcement of ban on timber trading</li> <li>• Ban on chopping timber trees for firewood and fences</li> <li>• Awareness raising campaign on conservation of nature and environment</li> </ul>		<p>Effective control of unsustainable practices</p>

## 4. MARKET ANALYSIS AND RECOMMENDATIONS

The task of market analysis was to find out about the market for the existing and potential products within the area, the processing technologies, and the current market and development tendencies, constraints and opportunities. Based on the findings relating to these matters, recommendations for specific products are given below to match the intervention plan proposed in table 5.

### 4.1 Candidate products

The starting list of candidate products is presented in the following table.

Table 6. List of products for key informants consideration

#### *Rattan, Bamboo & Other NTFPs*

- Heo (Calamus salicifollus Becc)
- Song
- May (Calamus rudentum Lour)
- Treo doi (Calamus poilanei Conrard)
- Chu ca
- Nua (Arundinaria racemosa Munro)
- Giang (Dendrocalamus patellaris Gamle)
- Tre (Bambusa vulgaris)
- La non ( hat leaves)
- La dong (rush leaves)
- Choi dot (Broom grass)
- La co (palm leaf for roof)
- Cafe (Café)
- Trau (Tung oil tree)
- Que (Cinnamomum spp)

#### *Fruit trees*

- Xoai (mango)
- Cam bu (orange) (Cirus aurantum)
- Cam chanh (one kind of orange)
- Cam sanh (one kind of orange)
- Cam giay (one kind of orange)
- Buoï Phuc trach (Phuc trach Pomelo)
- Chanh (Citrus medica)
- Quyt (Mandarin)
- Hong (persimmon)
- Vai (Litchi sinensis)
- Nhan (longan)
- Mo (Apricot)
- Man Tam hoa (Tam hoa plum)
- Na (Castard apple)
- Chuoi (Banana)
- Hat tieu (black pepper)
- Cafe (coffe)

#### *Animal products*

- Mat ong (honey)

#### *Timber trees*

- Lim (Erythrophoeum fordii Oliver)
- Tau (Vatica tonkinensis A. Chev)
- Doi (Talauma gioi A. Chev)
- Vang tam (Manglietta fordiana)
- De (Machilus velutina Champ)
- Bop (Cinnamomum litseaefolium)
- Goi (Amoora gigantea Pierre)
- Lat (Chukrasia tabularis A. Juss)
- Muong den (Cassia siamea Lamk)
- Tram trang (Canarium album)
- Nao (chua) ( Albizzia stipulata Boivin)
- Cong trang (Callophilum dryobalanoides Pierre)
- Rang rang (Ormosia tonkinensis Gagnep)

Bach dan (eucalyptus)

#### *Medicinal plants*

- Cu mai (Dioscorea persimilis)
- Thien nien kien (Homalonena acculta)
- Thach xuong bo (Acorus graminus)
- Bach bo (Stemona saxorum Gagnep)
- Ha thu o trang (Streptocalon juvenas) (antiperetic)
- Bo cot toai (Drynaria fortunei)
- Nhan tran (Adenosma glutinosum)
- Tho phuc linh (Smilax glabra)
- Cau tich (Cibotium barometz)
- Sa nhan (Amomum vilosilum)
- Chan chim (Schefflera octophylla)
- La khi (Ardisia silvestris)
- Kim ngan hoa (Lonicera macrantha)
- Chi sac (
- Cau rung (Areca triandra Roxb)
- Hoang dang (fibranrea linctoria Lour)

The key informants were suggested a lists of potential products for comment and after rough deselection a ranking exercise was carried out. This information was useful because it reveals what the villagers do and do not know about each of the products, and how they assess the products individually, but the following results from the “free choice” ranking exercise are probably a better indication of the villagers’ overall preferences.

Table 7. Products prioritization of the key informants.

Product Category	Rank	Product Choices Within Each Category			
		Village 5 of Hoa hai commune	Village 5 of Huong minh commune	Tung Qunag Village of Vu Quang commune	Village 4 of Son Kim commune
Rattan & others	1	- que planting - rattan regeneration	que	coffee	que
	2	beekeeping	chi sac	beekeeping	
	3	chi sac	rattan regeneration	chi sac	
Fruit trees	1	Buoi phuc trach	cam bu	cam bu buoi phuc trach	cam bu
	2	cam bu	cam sanh	cam chanh chuo	vai thieu
	3		buoi phuc trach		mo
Timber trees	1	vang tam	vang tam		vang tam
	2	- tram trang	lat		tram trang
	3	- lat	tram trang		

#### 4.2 Final results of the market analysis and recommendations

Based on the overall results of the market analysis, the recommendations of the Marketing Team are given in table 8. Four categories of recommendation are given: 1) first rank (highest recommendation), 2) second rank (2<sup>nd</sup> highest recommendation), 3) possible but not highly recommended, 4) should be eliminated from further consideration due to poor market value or other constraints.

Table 8. Market assessment and final recommendations

1 First rank 2 Second rank 3 Possible 4 Eliminated	RANK	<b>MARKET ASSESSMENT</b>
<b>RATTAN, BAMBOO, etc.</b>		
Que	4	Price is continuously going down due to oversupply. At present, cinnamom have been planted in many areas of Vietnam and its resource in ten year will be big. Although soil in Vu Quang is very favourable to cinnamom development, it is not recommended to grow any more
<b>Song</b> <b>Treo doi</b> <b>Chu ca</b>	2	Very high demand and high price. Resource is exhausted in Vietnam and good Song is mainly from Laos forests. these products are used to make furniture of the best quality to export to markets of developed countries. These slow growing species to be semi-domesticated in the managed forest as long term investment.
<b>Heo</b>  <b>May</b> (various types)	1	There is a large demand, from the export furniture and handicraft market in Nha Trang, Thai binh, Ha Noi, Da nang, Nam dinh. There is complaint on bad quality of products due to immature harvest. May and Heo from Ha Tinh is better in quality than from other areas of Vietnam, but can not compete with those from Laos. These two fast regenerating species to be semi-domesticated and harvested sustainably in the well managed forests. It is recommended to grow May along boundary the fields as alternative to the fences made of timber
La dong (rush leaves)	3	The resource is easily regenerated and there is demand only on tet hollidy.
La non	3	The resource is easily regenerated and under no threat at present. There is low demand due to competition of synthetic hats. It is not necessary to put ban on harvesting the rush leaves if it can bring income to the poor people and relieve impact on other endangered species.
<b>Nua &amp; giang</b>	2	The resource is easily regenerated and used only for local and Duc Tho market. Recommended for sustainable harvesting in the managed forests
Tre ( <i>Bambusa arundinacea</i> )	4	No market. Generally this “construction grade” bamboo is only viable if it can be produced close enough to a large urban demand center. Itt not recommended to grow tre in Huong khe and Huong son
Trau	4	Price of fruit is very cheap. No traders come to buy. The tree can be used only for fuelwood.
Choi dot	4	Only local market, low demand
Co	4	Low demand. It is being replaced by more durable roofing materials.Used for local market (mainly Duc tho) and

		households need.
<b>FRUIT</b>		
<b>Chuo</b>	<b>2</b>	High price, high unsatisfied demand in local and the Ha Tinh town market. There are three types of bananas in the market; two of them are imported from the south and all of them are of low quality. The price is 30-50% higher than in Ha Noi.. However, in Vinh market its price is similar to Hanoi and demand is low. It recommended to grow in limited area sufficient for inside Hatinh consumption
Hong	3	High price, high demand in Ha Tinh market for red persimmon which has to be imported from the north. The price is very high because it is hard to transport (risk of bruising). Question: How well does it grow in Vu Quang area?
Ca fe	3	Large international market and high demand. Reported by the farmers to grow well and give fruit in Vu Quang. More study on quality and yield to be carried out
<b>Ha tieu</b>	<b>2</b>	High price in Ha Tinh and Vinh market market for black pepper. All of the current supply is imported from the south and the price is the same as in Ha Noi. In Vietnam this product is mainly for export Some households in Huong khe and Son Kim have planted and fruit is good. More study to be made before decision to grow in large scale.
Du du	4	demand is not high, local market only
<b>Cam bu (orange)</b>	<b>1</b>	Very high demand and high price (15000-25.000 dong/kg). Currently can not satisfy Ha Tinh and Vinh Market. Harvested by tet holliday. Easy to grow and high yield . The only shortcoming is short longevity of tree and harvesting duration is short. Recommended to grow at large scale to supply to the northern province market.
<b>Cam chanh (orange)</b>	<b>1</b>	Large market, high demand. Quality is considered the best Harvested during last 3 month of year. Orange sells for 4000-5000 D/kg at harvest time in Ha Tinh. Traders buy from former plantation workers of the former National Fruit and Vegetable Company in Huong Khe District of Ha Tinh. Production is sufficient only for the local demand. No traders from other provinces come to buy, but the Province has plans to increase production to “export” levels in future. Has to compete with oranges from many areas of country. Price is not as high as cam bu but time for harvesting is long. Immature fruit can be marketable, longevity of tree is higher. Recommended to grow in mixed with Cam bu
<b>Cam sanh (orange)</b>	<b>1</b>	Large market. High demand and high price (8.000-18.000 dong/kg). Harvested in spring, harvesting time is long. The question is How well does it grow in Vu Quang area? Some farmers said it grows well.. trusty seedling source and technical assistance is needed.
cam giay (orange)	4	moderate demand and price. few farmers has experience in

		growing. yield of fruit not high
<b>Buoi phuc trach (pomelo)</b>	<b>1</b>	High demand, high price. Quality of product growing in Huong minh, Hoa Hai is inferior to Phuc trach pomelo, but traders buy and sell in Phuc trach to buyers from the North as indigenous pomelo. Easy to grow and good yield. Farmers need trusty source of seedlings. recommended to grow at large scale
Na	3	it does not occur in Huong khe and Huong son. It is easy to grow and easy to get seed source. Price is high but very difficult to keep fruit. recommended to grow in small number to satisfy local market
Man tam hoa	4	domestic market is saturated, harvesting season is short, price at peak of season is low. No primary processing technology to keep product for longer time
Mo	<b>2</b>	good price in Vinh and Ha Tinh market (8.000 dong/kg) same price in Hanoi. easy to grow. recommended to grow in small quantity to supply to inside province market
Chanh	4	Low price and demand, consumed mostly by Vinh and Hatinh market that have been fully satisfied. easy grow and high yield. Many households have maintaining the lemon gardens and want to destroy (last year price 900 dong/kg). Lemon should not be planted any more in the areas
Nhan	<b>2</b>	Good price, high demand. The local variety grown naturally brings good yield and good price. as reported by one farmer, income from a longan 200.000 d/year. Improved variety to be grow in the areas
Vai	3	good price, high demand. Some litchi have been grown, develops well. But how does it give fruit? It should be observed carefully for certain period before introducing litchi to Vuquang to grow in larger scale because it requires farmers to have the big initial investment
quyt (mandarin)	4	quyt in Vinh and Hatinh market is of bad quality and very low price. farmers has very little experience in growing quyt and no good seedling source in the area
Xoai	3	Mango in Ha Tinh and Vinh market and Northern provinces are mostly from south Price is good. high demand. Some improved variety (chinese variety) is reported to give good fruit in Cam xuyen. More study to be carried out before growing mango in big quantity due to it high investment (High cost of seedling)
<b>TIMBER &amp; FUELWOOD</b>		
<b>Lim</b>	<b>2</b>	Timber of best quality, very high price an high demand, big market. Very rare in forest. this will always be a good tree to plant as a long term investment. However, many farmers do not like to grow due to long term for harvesting
Tau	4	low demand, good price. resource in forest is good. Used mainly for pole. harvesting time is long

<b>doi</b>	<b>1</b>	good price, good demand. time for harvesting is not as long as lim. It is easy to get seed and produce seedlings. Most farmers in Son Kim plant doi in agroforestry garden
Muong den	3	price is the same as de and bop, but harvesting time is two times longer. market is not as high as lim and doi.. farmers do not like to grow muong den
<b>Cho chi</b>	<b>2</b>	same as doi, high demand and good price for house construction and furniture
<b>De</b>	<b>2</b>	Price is not as high as doi, but harvesting time is shorter. large market. recommended to grow in agroforestry gardens or semi-domesticated in degraded forests
<b>Bop</b>	<b>2</b>	Similar to de
Chua	3	good price, but harvesting time is long.
Cong trang	3	Price is a bit lower than bop and de, harvesting time is similar. Market is not as large as the two mentioned
<b>Rang rang</b>	<b>2</b>	Good price, high demand short time for harvesting, easy to grow
<b>Lat</b>	<b>1</b>	good price, high demand. time for harvesting is shorter. It is popular timber tree in Northern provinces. It is easy to grow. Assistance to be given to farmers in finding seed source and growing technique
<b>Tram trang</b>	<b>1</b>	Fast growing timber and fruit tree. Fruit demand is high in China. Timber of lower quality and price but has good demand. Farmers prefer to grow on forest land due to short time of harvesting and easy technique of growing
<b>Vang tam</b>	<b>1</b>	a high value, good market, rare timber. Moderate term of harvesting. this is indigenous tree, easy to grow. the seed source to be provided to farmers
<b>Keo</b>	<b>1</b>	Suitable as fuelwood for domestic consumption and local markets. Soil structure improving species. can be a good shading to timber or NTFPs seedlings. Recommended to grow in mixed with high value species as the pioneer trees
Bach dan (eucalyptus)	4	The is currently a nationwide ban on the planting of this tree. There is also no market for it. It is a fast growing tree that is often blamed for many kinds of planning mistakes, but unless the situation changes it should not be planted by the project.
Gio tram (eaglewood)	4	This tree is also banned. The recent boom and bust of eaglewood planting in Thailand should be a warning to others. In Thailand very few of the large number of planted trees could be made to produce the valuable resin.
<b>MEDICINAL PLANTS &amp; OTHER HIGH VALUE NTFPs</b>		
Chan chim	4-	low demand, low price. resource is good

<b>Sa nhan</b>	<b>2</b>	Good, stable market in China, Hong cong, Taiwan if good quality. Recently received lower price due to poor quality because of immature harvesting do to competition in the commons. good understorey species for domestication into private agroforestry gardens or in degraded natural forests. The herbs traders and growers in Huong khe and Huong son advice to enrich understorey of forest by this species. They grew in their gardens and yield of fruit is high. Currently trader in Son Kim buy amomum from Laos and sell to Ha Tinh, Vinh or directly to Ha Noi
<b>Hoang dang</b>	<b>2</b>	high price, mainly for china marketand market is not stable. recommended for sustainable harvest in managed forest
<b>Son binh lang</b>	<b>2</b>	moderate price and demand. resource become scarce because it regenerates slowly and trunk of tree is chopped down to make chopstick. trees should not chopped down in the managed forests
<b>Tho phu linh</b>	<b>2</b>	Low price and high demand. resource is very good. primary processing technology is needed
<b>Chi xac</b>	<b>1</b>	Ha Tinh chi sac is of the highest quality, high demand crop for the Chinese market. Huong long, Huong vinh, Huong lam, Huong lien, Phuc trach are growing areas. It is said to be easy to grow in gardens and on the hillsides. A woman in Hoa Hai had one tree with good yield. She could sell at 4.500 dong/kg. the buying price at Vinh market is 6.800ddong. This product was suggested to grow by medicinal plant wholesalers in Huong khue, Ha Tinh and Vinh City who have large standing orders from China that they are unable to fill.
<b>Cui mai</b>	<b>1</b>	High price, good demand for domestic and oversea market. People in Chau giang district of Hung yen grow in large scale. Wholesalers in Huong khue and Son Kim advice to grow cu mai. It was planted in Son Kim health station last year and very good yield was obtained. Traders in Ha Tinh and Vinh complained about drying quality problems and advice to assist farmers in drying technology. Recommended to grow in agroforestry gardens
<b>Thien nien kien</b>	<b>1</b>	stable demand, high price. Used both for domestic and oversea market. The price is good in Son Kim (5000d/kg) but low in Hoa Hai (2000 dong/kg). fast regenerating species. technique for harvesting sustainably in managed forests should be introduced.
Cau tich	3	Low price, stable market, easy to harvest. Resource is good. to be harvested sustainable in the managed forest
<b>Cot toai bo</b>	<b>2</b>	Good price, high demand. Resource in Son Kim is good but scarce in the others. sustainable technique of harvesting in managed community forest to be introduced

<b>Thach xuong bo</b>	<b>2</b>	Good price, high demand. The natural stocks are now also exhausted. It is a good candidate semi-domestication in managed forests.
Bach bo	4	Low price and low demand. Cost of harvesting is high, can not compete with the cultivated in yield
<b>Nhan tran</b>	<b>1</b>	Very high price in local market in comparing to the northern provinces. good market in Huong khe, Huong son, Vinh and Ha Tinh. Local herbalists and traders advice to grow in Huong son and Huong khe. this annual plant is said to be very easy to grow and yield is high.
Ha thu o trang	4	The local type is the white one (ha thu o trang), not the red one (ha thu o do) which is widely used in traditional Vietnamese & Chinese medicine. Both are considered too hard to dig and too low priced to be profitable.
<b>La khoi</b>	<b>2</b>	Good price, very high demand for domestic market. The resource is exhausted. Semi-domestication and sustainable harvesting technique to be studied and applied to the managed forests
<b>ANIMAL PRODUCTS</b>		
<b>Honey, pollen, etc.</b>	<b>1</b>	There is good demand for assured quality forest fed honey from domesticated bees, it is reported by farmer-bee-keepers to be profitable business. In Son Kim honey produced by farmers is more than two times costlier than those in shops of Tay son town. The further technical assistance in beekeeping to be provided to farmers.