

Survey Report

Assessment of potential products in Tuyen hoa and Minh Hoa districts, Quang Binh province



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I. INTRODUCTION

1. Background and necessity for the survey

Tuyen Hoa and Minh Hoa are two mountainous districts on the west of Quang Binh province, whose natural area are mainly forest land. The agricultural land only accounts for 4% of the total natural area), resulting in limited food productivity. With the other projects and programs of the government and other organizations in Tuyen Hoa and Minh Hoa districts, the Integrated Food Security Project (IFSP), phases 1996 – 2002, applied the methodology of Market and Development and Research to identify activities and support the local people in earning additional incomes from non-timer forest products (NTFPs) and also domestic plants. The IFSP supported a range of households in earning additional incomes from the bee keeping for honey, mushroom production, and also conducted surveys for pinpointing medicinal plants of high economic value ... Until now, many households have retained the production and developed the products. The project of Sustainable Management of Natural Resources in Central Vietnam is also funded by the German Technical Cooperation Organization (GTZ) and implemented in the area of Tuyen Hoa and Minh Hoa districts, for the period of 2004 - 2007. One of the SMNR-CV designed components is to continue support to the income regeneration activities from processing, marketing NTFPs on the basis of consolidation of the IFSP achievements and seek and identify new opportunities for further activities. Therefore, the assessment of the situation of the products, which have been identified, experimented and offered the considerable source of incomes for the local population is of high necessity.

2. Objective of the survey:

The survey is aimed at collecting information of the products of bee honey, bamboo craft, mushroom production, mulberry and silkworm and chi xac for the following specific aspects:

- Qualitative and quantitative demands, markets of different products, marketing skills of the local producers on how to sell their products. Existing market chains, constraints and problems in the consumption.
- Number of local producers and sellers of the products, production scale, productivity and production, harvesting, preservation, processing and capacity and skills in application of production techniques. Epidemic information and measures applied.
- Investments, demands for investment fund and orientation for production extension.

Based on collected information and data, analysis and respective recommendations are made for extension and development of the potential products.

3. Scale of the survey:

7 communes In Tuyen Hoa commune: Dong Hoa, Chau Hoa, Le Hoa, Huong Hoa, Thuan Hoa, Mai Hoa and Phong Hoa.

7 communes in Minh Hoa district: Thuong Hoa, Hoa Thanh, Hong Hoa, Hoa Hop, Minh Hoa, Yen Hoa, Trong Hoa and Xuan Hoa.

4. Participants:

The survey has been conducted by the staff of SMNR-CV result 4, Mr. Trang Hieu Tuong, national expert and Mr. Doan Ngoc Luong, responsible staff. The survey conduction has also facilitated by the Technical Support Teams of the two districts and collaborators who are related staff in the selected communes.

5. Methodology:

Questionnaires are used during the survey for data and information collection at three levels, commune, village and household.

290 questionnaires have been used by the commune collaborators to gather related information in the households. The survey has used the secondary data: reports of the communes. In addition, random interviews were also conducted to a number of commune staff and local people for unclear information. Furthermore, the market research reports from the IFSP was a source of reference for the products of bee honey, mushroom and medicinal plants. And the related information at the national and international levels has been searched out from internet.

The filled questionnaires were gathered and data entry made on computer Excel separated by district, commune and village. Analysis is then made for different products and report prepared accordingly.

II. SURVEY RESULTS:

CHAPTER I – BEE HONEY

1. Overview of the bee keeping in Vietnam and market of bee honey in Vietnam

As a tropical country with diversified ecological system, the bee keeping in Vietnam has been practiced long time ago. It has been developed in more than 20 provinces in the North, Central and the South, with high productivity. The highest productivity is mainly produced and harvested in the southern provinces: Dong Nai, Ba Ria, song Be, Tien Giang and Vinh Long, next is in the High Land: Dak Lak, Gia Lai, Kon Tum and Lam Dong and the last ones are the northern and central provinces. There are three breeds of bees mainly kept: exotic bees (mainly Italian bees – *A. mellifera*) and domestic (*A. cerana*) which are kept by the improved method with mobile bee comb, harvested by the centrifugal machine; and forest bees which are kept by the local people in mountainous areas, keeping in wooden box before and now shifted to keeping in improved bee comb (*A. Dorsata* or *A. Cerana*)

Data of bee honey consumption of Vietnam:

Year	No. of bee hives (hive)	Total yield (ton)	Export yield (ton)
2001	450,000	10,000	8000
2002	600,000	17,000	14,500
2003	670,000	14,000	11,500

Since China - the biggest export country for bee honey, with 100,000 tons/year has lost its credibility to the imported countries due to excess antibiotic residue cloramphenicol in the bee honey, Vietnam has been considered as on of the highest credible countries in export of bee honey (together with Argentina, Mexico and Chile). The price of bee honey for export in Vietnam has been remarkably increased from 850 USD/ton to 1,500 USD/ton.

2. Bee keeping in Quang Binh province and in Tuyen Hoa and Minh Hoa districts:

2.1- Bee keeping in Quang Binh province:

Quang Binh is a province in the Central of Vietnam, bordered to Ha Tinh province in the north, Laos in the west, Quang Tri province in the south and the sea in the east. It has the total natural area of 8,037 km² with 6 districts and Dong Hoi city. The majority of the local

people earn a living by agricultural production; the agricultural land covers for 59,386 ha and forestry land covers half of the total natural area – 473,317 ha. Almost forest trees and agricultural plants offer a source of flower pollen for bees of different kinds. The bee keeping has been practiced for a long time in all 6 districts and Dong Hoi city; however the bee keepers have so far kept bees by the traditional method (by wooden boxes). No exact figure of the bee keepers in the districts and Dong Hoi city but their production is very limited, even the quantity of bee honey consumed in Dong Hoi has come from Tuyen Hoa and Minh Hoa. Since the improved bee keeping method has been applied, disseminated and replicated in Tuyen Hoa and Minh Hoa districts the quantity of bee keepers and production has increased manifold.

2.2 Bee keeping in Tuyen Hoa and Minh Hoa districts

2.2.1 Overview of the natural and socio-economic conditions in relation with the bee keeping for honey in Tuyen Hoa and Minh Hoa districts

As the two districts in the northern west of Quang Binh province, Tuyen Hoa and Minh Hoa districts has the total population of about 140,000 people, of which the majority are Kinh people and the minority groups covers for 2-4%, including Khua, May, Sach, Ruc and A rem in Minh Hoa and Ma Lieng, Sach in Tuyen Hoa. The districts has the majority natural forest land out of their natural area; with the natural area of 115,824 ha in Tuyen Hoa and 140,000 ha in Minh Hoa; and the natural forests of 86,364 ha in Tuyen Hoa and 90,000 ha in Minh Hoa. The flower pollen from the trees and plants in the two districts are abundant and rather similar, mainly from forest trees (such as Trin, Lan, Chan chim, Gie, Chac Chiu...) and then industrial species (Rubber, Acacia and Eucalyptus). These species have flowers nearly in the year around, except the months of rainy seasons: September, October, November and December. It has two distinct seasons, the hot season is from April to August (the highest temperature is 40° C, lowest is 16° C); the cold season is from September this year to March of next year (the highest temperature is 32° C, lowest is 7° C). The dry season is from February to August and the rainy season from September this year to January next year, with the annual average rainfall of 2300mm. Especially, in Tuyen Hoa district the hot and dry westerly wind (from Laos to Central Vietnam) is prevailing from June to July every year.

2.2.2 Current situation of bee keeping in Tuyen Hoa and Minh Hoa districts

2.2.2.1 Source and development of the bee keeping

Traditionally, the local people in Quang Binh province has known the specialty of bee honey in Tuyen Hoa and Minh Hoa districts. Before the coming of the IFSP Quang Binh (1997, the local people in most of the communes in the two districts often caught bees from and collected bee honey in the forests from May to July annually. There were mainly three kinds of bee breeds the local people often caught for honey or keeping: “Khoai” bee breed or forest bees (*Apis dorsata*), domestic bee breed (*Apis Cerana*) and “fly” bee breed (*Apis florea*). The majority of bee catchers are in the communes of Hoa Hop, Hong Hoa, Xuan Hoa, Minh Hoa, Hoa Thanh and Hoa Tien in Minh Hoa district, Lam Hoa, Thuan Hoa, Thach Hoa in Tuyen Hoa district. The yield of honey produced in 1996 reached about 10 – 15 tons in both districts. On average, each commune has around 20 people keeping domestic bee breed with the traditional method.

In 1997, the IFSP had collaborated with the National Center for Bee Research and Development in conducting an assessment survey of potentials for bee keeping based on the improved methods in the two districts. The survey found that the potential for developing the bee keeping for honey in the districts is very high. From 1997 – 2001, 22 training courses on bee keeping based on improved methods had been conducted by the IFSP for 432 interested people in the districts, with 357 beehives of domestic breed provided for the people who well understood the techniques. The beekeepers have been also supported by the project to establish as bee keeping clubs, and 36 centrifugal bee-keeping boxes provided to these clubs. The IFSP also trained 6 local people as bee-keeping trainers in the two districts so that they can transferred the trained knowledge and provided technical consultancy to the bee keepers. Furthermore, in order to help the kee keepers for accessing to needed inputs, the IFSP supported to establish a unit for production of bee foot layer for the purpose of multiplication of bee hives and replacement of bee foot layer.

This survey was conducted in 14/36 communes in the two districts, with the involvement of 52 villages. Selection of the communes was based on the number of bee-keepers available in commune (referred to the data of the IFSP), ensuring the representative of the commune with potentials for bee keeping and the communes without. The survey revealed that in the 14 involved communes, there are 654 households keeping bees, of which 528 households apply the improved method and 126 remaining households apply the traditional method. The yield of bee honey produced in 2004 is 8,135 kg, in 2003 - 7,374 kg and in 2002 – 9,003 kg (see the annex 1). Fifteen questionnaires at village level do not show the honey yield of 128 households keeping bees. The above yield has not included the harvesting in November 2004 (up to the date the survey was conducted). Thus, in fact the yield of honey produced would be much higher. Estimated that the total number of bee keepers in the two districts would be 810 (the total number of bee keepers in 14 involved communes added with the number of that in the remaining commune; the latter is taken from ones trained and provided with bee hives by the IFSP).

With a focus on assessing the 109 bee keeping households in 13 communes (except 7 households in Xuan Hoa commune who have so many bee hives compared with the other communes, the survey has shown that the average period these households have so far kept bees is 4.6 years; with this period of time they have obtained certain related experiences. Out of the 116 bee keeping households asked, 18 households participated in bee keeping technical training courses supported by IFSP, 35 households have learnt the techniques themselves (covering 30%). In fact the latter households have learnt the techniques through gatherings of household groups, bee keeping clubs or from other households. In terms of the experience and knowledge level in bee keeping, 98 households (84%) answered that they have insufficient techniques in bee keeping based on improved method; they lack the skills and knowledge in aspects of techniques for disease prevention and control for bees, techniques of creating queen bees for hive multiplications. For the bee breed hives, 56 households said that it is easy to buy (covering 48%); they have often bought it from other households in the bee keeping clubs or in the village (see annex 2 for the details).

2.2.2.2 Production and market:

The average number of bee hives per household is 5.3; the average yield of honey collected per household in 2004 achieves at 26.4 bottles (not including the yield in November 2004), in 2003 – 35 bottles and in 2002 – 30.9 bottles. The survey reported that the honey collected is mainly for selling, covering 88% of the total yield. As a result, for every 3 years of keeping bees, each household earns 945,000 VND from bee honey, on including the amount for home use (each bottle costs 35,000 VND). Generally, the amount of bee honey annually produced can be sold out also in the year; 15% of the households have no idea for consumption of bee honey, 50% stated that their bee honey was fro selling and 30% mentioned that it is difficult to sell the product. But in fact they all can sell out their bee honey in the year. The bee honey is often sold out in households (98 households), only 18 ones sell it in the commune or district markets. Around 70% of the households revealed that there is

counterfeit bee honey in the market. It could be a reason leading to difficult consumption of bee honey in the market.

The harvesting of bee honey is separated in to district seasons, one is from March to May (solar calendar) and one from November to December (solar calendar). A number of the bee keeping households in some areas with many bee keeping households and earning a rather high yield of bee honey such as Xuan Hoa, Hoa Hop communes in Minh Hoa and Thuan Hoa in Tuyen Hoa said that it is difficult to sell the honey (could be understood that difficult to sell the honey right after the harvesting). Here the bee honey is often harvested by the improved method, making it not mixed with other substances due to harvested by the centrifugal machine/box. The honey in the two districts often have two major colors depending on different flower season: light brown and light orange. And normally the buyers prefer the honey with light brown (see the Annex 3).

Through the interviews to the bee keepers having high amount of honey (Mr. Dinh Long in Xuan Hoa commune, Mr. Nguyen Van Hung in Le Hoa commune, the local bee honey often bought by the customers from Dong Hoi city or other districts who, during their missions, combine to buy honey right at these households or at the shops in Quy Dat or Dong Le towns where the local bee honey is sent for selling.

Estimation of the bee honey demands at the present and in the coming years: Referring to the results of the survey on bee honey research conducted by the IFSP in December 1999 (by Mr. Dang Ngoc Hieu, Vietnam Bee Company), Quang Binh people prefer the bee honey produced in the province, especially in Tuyen Hoa and Minh Hoa districts, than the honey from other provinces sold in the pharmacies or honey of the bees eating rubber flowers in the Central High Land. The demand for bee honey of the consumers in the whole province of Quang Binh in 2004 is estimated around 85 tons; and in 2005 is 100 tons (see Annex 4).

2.2.2.3 Development plan of the bee keeping households and policy of the local authority

Out of 116 interviewed households, 100 households said that they would continue the development of bee keeping. And all 14 communes involved also have elaborated plans for the development of the bee keeping in their communes. All communes have seen that they have potentials for bee keeping such as the forests and a variety of species offering abundant flower pollen. Many households have gained good experience in the bee keeping. The orientation plan of the communes specified some major activities: - organize training courses on bee keeping techniques for interested households, especially how to prevent and control diseases for bee, how to develop queen bees for hive multiplications; - establish bee keeping clubs, increasing the number of bee hives in the commune area.

2.2.2.3 – Comments and Recommendations:

a. Comments:

Tuyen Hoa and Minh Hoa districts have the natural conditions potential for developing the bee keeping for honey, with the source of honey and flower pollen for different kinds of flowers and forest trees and plants, industrial and forestry trees. Until now, the bee keeping for honey based on improved method has been stably developed and offered rather high income for many households involved. From 422 people trained, there have been 810 households keeping bees for honey, with the total estimated number of bee hives in the tow districts of around 3,500. It has shown that the achievements of the bee keeping of the districts gained from the IFSP support is sustainable. The demonstration of the bee keeping clubs has also proven its defined effects for the extension and development of the activity. The survey indicated that most of the bee keepers have obtained necessary skills and experience, basic knowledge in bee keeping based on improved method. However, 84% of the bee keepers mentioned that they are still in lack of the techniques on how to prevent and control diseases for bee and how to develop queen bees for multiplications. Even if there is a

team of bee keeping trainers (6 members), non of them focuses on providing consultancy or making business from bee keeping. Only Mr. Dinh Long (Xuan Hoa commune, Minh Hoa, Mr. Nguyen Van Huong and Mr. Mai Van Thieu in Le Hoa commune (Tuyen Hoa) have multiplied and provide bee hives, produced and provide foot layers to the people interested in the nearby communes.

The current yield of bee honey, around 20 tons honey from keeping and 10 tons collected from the forests in the two districts has not met the market demand, with the price of 35,000VND/kg (the demand estimated for the whole province is 85 tons of honey whilst only Tuyen Hoa and Minh Hoa districts are the major source. Particularly, the users of Quang Binh province prefer the bee honey from Tuyen Hoa and Minh Hoa districts; it is an big advantage for the bee keepers. Sometimes, there is counterfeit bee honey in the market of the two districts, making the customers confusing and skeptical when purchasing.

b. Recommendations:

For further development of the bee keeping for honey in Tuyen Hoa and Minh Hoa districts as well as in other areas in Quang Binh province, the following issues and activities should be addressed to:

- Effectively strengthen the experience exchange and disseminate the effects of the bee keeping in the area through newspaper articles, reports in the local radio and television, study tours and experience sharing between the communes in the districts (Xuan Hoa, Hoa Hop in Minh Hoa districts and Thuan Hoa, Mai Hoa communes in Tuyen Hoa districts could offer the bee keeping demonstrations for learning from.
- Organize more trainings on bee keeping techniques based on the improved method for interested people.
- Establish more bee keeping clubs for associations of bee keepers in the two districts for strengthen the experience sharing amongst the bee keeping households and transfer the techniques to other interested ones.
- Establish bee keeping extension workers in the area of two districts (advanced trainings for extension workers at commune and district levels), ensuring regular provision of technical consultancy to the bee keepers, especially the techniques on how to prevent and control diseases for bees.
- Select out typical bee keepers through the district Extension Stations and support in development of bee hives units, including necessary equipment and tools and medicines for bee diseases to people with demands.
- Support the bee keeping clubs in registration and management of their product with specific trade mark or labeling in order to resist the counterfeit bee honey.

CHAPTER II – BAMBOO AND RATTAN CRAFT

1. Production and markets of Vietnam bamboo and rattan products

After an interrupted and limited period of export due to the financial and political crisis of East-European countries, at the moment, Vietnam has established relations to and explored some new markets; productivity and value export of wooden, bamboo and rattan products is rather stable and seems gradually increasing. Import countries, which are the main markets of Vietnam, include of EU countries, Taiwan, South Korea, Mid Asian countries, United States and Japan. EU countries, United States and Japan are considered as potential markets of fine arts, bamboo and rattan commodities. As statistics of Ministry of Trade, total value of export turn-over of fine arts and bamboo and rattan commodities was USD 331 and 367 million in the years of 2002 and 2003 respectively, in which the value of bamboo and rattan commodities shared USD 60 million per year approximately and shows an upward tendency.

The tendency of using bamboo and rattan products domestically is also growing due to the restriction of exploitation and process as well as the price increase of wooden products. People began to buy and use products made of bamboo and rattan instead of wood.

At present, all over the country, there are hundreds of enterprises and companies specialized in producing and exporting bamboo and rattan products, in which many of them are joint venture or 100% foreign invested capital. Beside the advantages and changes, bamboo and rattan industry still faces some constrains and difficulties, especially in term of raw materials, which become rarer and rarer due to lack of plan for integration of exploitation and conservation. In coming time, enterprises will be more difficult in actively making their long-term production plans; there still lacks an appropriate attention to marketing activities. Number of artisans and good workers reduces while vocational training for young generation is restricted. On the other hand, there still lacks encouraging policies in credit and tax.

2. Bamboo rattan craft in Quang Binh province

The bamboo and rattan craft has been performing in Quang Binh province since long time. There are 10 specialized traditional craft villages which involves more than 9.000 households occupied in Quang Trach, Le Thuy and Bo Trach Districts. Among these, Quy Hau village in Le Thuy District, Tho Don and Xom Chua villages in Quang Trach District have majority of population concentrating on production of rattan and bamboo products, creating main income for localities (More than 1000 households/ village).

Main products of these villages are leaf hats (use of rattan and bamboo materials), furniture and tools for daily lives as well as production like many types of baskets, ladders for more rural markets. Since Quang Binh Province split up from Binh Tri Thien Province in 1989, some state import and export companies have been making purchased orders to these villages for providing rattan piece to export to East Europe and Italy but markets were not stable and some times interrupted when East Europe collapsed.

Currently, import – export companies continues making purchased orders to these villages with rattan piece to export to Italy and China ... also some local companies have organized enterprises for wood and rattan/bamboo manufacturing furniture for domestic markets like Long Dai United Industrial Forestry Company (renamed as Quang Binh Southern Industrial Forestry Company). Products of these companies are like tables, chairs, shelf and baskets. Demand on these products of local population do not express large amount as majority still have preferences in using wooden furniture. Nevertheless, woods has been getting scare and with policy of government limits in exploiting woods, so the choice for use of rattan/ bamboo furniture has been increasing. People have changed habits to use more rattan/ bamboo furniture to replace wooden ones, many households bought rattan book shelf, baskets ...

3. Bamboo and rattan craft in Trong Hoa commune, Minh Hoa district

3.1 Overview on natural and social-economic condition of the locality

Located in the South-west of Minh Hoa, 55 km from the centre of the district, the population of Trong Hoa commune is 2989 (448 households), of which 100% are ethnic minority people (mainly Khua). Trong Hoa commune has just been splitted from Dan Hoa commune in 2002. Trong Hoa has a very favourable condition in terms of traffic with the Highway No.12 running across 30 km to Cha Lo border in the west. Total natural area is approximately 2989 ha including 97 ha of agricultural land (mainly cassava cultivation), the largest part 1975 ha of forestland, 597 ha of meadow and some water-surface areas. Agricultural production stands at a very low level due to the backward habits with the total commune yield in rice about 80 tons/year. Animal husbandry is mainly concentrated on cattle and pig with a low productivity and disease uncontrolledness. Education and Health care is gradually improving however still in difficulty; illiteracy rate stands very high (65%) while malnourished rate of under-5 year-old children is over 30%.

3.2 Current state of bamboo and rattan craft in Trong Hoa commune, Minh Hoa District

3.2.1 History:

There is no accurate information about the history of this craft; however, as announced by local people, it originated long time ago from the habits of using forest raw materials to produce daily belongings by local people.

3.2.2 Number of people involved:

As showed by the survey results, at all 16 villages in Trong Hoa commune there are people who earn living with bamboo and rattan craft with the total of 89/448 households (sharing 20% total number of households) and till now the figure is about 160 people involved (averagely 2 people/household), out of whom women share 40%. The average age of these labourers is 49 years old, and factually, most of them are between 40 - 57 years old while the youngest is 25 and the eldest is 81.

3.2.3 Products:

Main products are in 4 sorts of Back-basket, Food tray, Mat and Hand-basket. Depending on their own experience and skills, products of each household express different levels of art. Designs and patterns are more or less different, for example, the differences in decoration and design of food trays (some with cube relief, some are different relief).

3.2.4 Experience in production:

Averagely the number of experience years of a household is 8.5, in fact, this figure stretches from 3 to 20 years and most of households have from 5 to 12 years of experience. Mainly they learned their professional skills from their relatives.

3.2.5 Annual production time:

Studying the annual production time of households in a period of 3 years (2002-2004), there is no change by years and the average duration is 4.8 months per year. Number of production months of households changes between 2 and 10, and for most of them are from 3 to 6 months.

3.2.6 Quantity of products:

Average quantity of products/household/year is 5 and in 3 main sorts of back-basket, food tray and mat. Total quantity of products produced by 34 households in the period of 2002-2004 is 549 and categorized in 3 sorts (quantity shares evenly by year). Statistic data shows that as for all products, 463 were sold and 86 kept for household use, average quantity sold per year by each household is 4 products.

3.2.7 Raw materials for production:

All sorts of bamboo and wild pineapple are used as main raw materials for production. As revealed by local people, this source of raw materials is always available in forests, however it is a long distance and difficult condition of walk and transport to their house.

3.2.8 Consumption place:

Most of products are exchanged and sold internally among households in the village or to passers-by. Some households sell their products at Y Leng market in Dan Hoa commune, 15 km from the centre of the commune. Average income of the households involved in bamboo and rattan craft is about VND 240,000/year sharing 40% of total household income.

3.2.9 Production orientation:

More than 90% of production households answered that they have intention to produce more products to sell.

3.2.10 Supportive policies to encourage handicraft by local authorities:

Craft development is one out of four emphasis programme of Quang Binh policy for development. But for Minh Hoa District, rattan/ bamboo craft has been just in process of identification there have not yet support actions taken to communes and villages

4. Remarks and recommendations:

4.1 Remarks:

Bamboo and rattan craft in Trong Hoa and Dan Hoa commune, Minh Hoa district is a traditional industry of ethnic minority people. It has a long foundation and development. There are many households (86) involved in this industry with the purposes of self-sufficiency and income generation. Local people are aware of conservation and development of this industry. Collected data shows that the average age of producers is 49 years old and they all were trained by their ancestors. Their skills and products have specific characteristics of ethnic minority people, that means same design and decoration as which of ethnic minority people in Nghe An and Ha Tinh provinces. Products that have design and decoration as nice as products made by Kinh people consist of food trays, back-baskets and mats. Production is still in a spontaneous way and at odd times that why the average time of production is 4.8 months per household but only 5 products made. Due there is no condition for product exchange to outside markets as well as their own production habits, people just produce when there is order of the buyers.

4.2 Recommendations:

Bamboo and rattan craft in Trong Hoa commune, Minh Hoa district is a traditional craft of ethnic minority people so it must be taken care and developed with the purpose of traditional value conservation as well as income generation in sustainable way based on appropriate exploitation and use of natural resources. Following things should be considered and supported:

- Exchange information, call for interest of related departments and district and provincial authorities such as Committee for ethnic minority, mountainous and religious affairs (CEMMA); cultural and/or natural resources conservation projects.
- Conduct workshops on study and identification of "Traditional value" of bamboo and rattan craft in Trong Hoa and Dan Hoa communes, Minh Hoa district. Prepare target and solution plans to support the development of bamboo and rattan industry in these locations.
- Propagandize and enhance the awareness of conservation and development of traditional trade villages.
- Establish groups of bamboo and rattan producers.
- Support to enhance production skills through internal training (Good producers will be trainers)
- Support to produce nice products as samples (with specific characteristics) to be presented and displayed at tourist places in and out of the province (Phong Nha - Ke Bang, My Canh, Bao Ninh).
- Support to access business concepts as well as initial skills for production planning.
- Support producers to visit and learn new designs so that they can diversify their products.
- Conduct study-tours for producers to traditional trade villages of minority people in other areas.
- Provide capital (under form of preferential credit for production enlargement).

CHAPTER III – MULBERRY AND SILKWORM

1. General information about industry of mulberry growing and silkworm breeding and silk market in Viet Nam

Mulberry growing and silkworm breeding is considered as a traditional industry in Viet Nam. Localities where there is a large area of mulberry growing and developed silk weaving such as Bao Loc in Lam Dong province and other provinces of Quang Nam, Quang Ngai, Dong Nai and Vinh Phuc. In all over the country, there are 25,000 ha of mulberry growing for silkworm breeding to produce silk. Every year, about 1,800 tons of various types of silk cord are produced; 1.5 million meters of worm silk are weaved; the export turnover nearly achieves USD 30 million. Worm silk products of Viet Nam are exported to Japan, United States, Korea, Thailand, India, Bangladesh, etc. Some knitwears have won Vietnam Golden Star prize and APEC Golden Cup in 2003. Mulberry growing, silkworm breeding and weaving bring about permanent employment and improved living for thousands of farmers in several locations. However, the efficiency of mulberry growing and silkworm breeding in Vietnam does not match potentials of this industry. The weakest points are low productivity and quality, from mulberry growing, silkworm breeding to weaving. Total area of mulberry growing in Viet Nam is 25,000 ha while the productivity is only 750 kg of cocoons/ha. Main reason causes by backward or even degenerated varieties of mulberry. For example: the variety named Sa Nhi Luan was largely grown in China tens of years ago, now is replaced with another variety higher productivity while recently, Viet Nam just started growing this Sa Nhi Luan variety. In the whole industry, there are only 6 enterprises who specialize in producing silkworm-eggs with capacity of 600,000 boxes/year and can meet 30% of market demand. The rest quantity of silkworm-eggs is imported from other countries, which quality is not strictly controlled. At the moment, in the whole country there are 11 silk processing enterprises of silk corporation, 8 local enterprises and hundreds of private households with total capacity of 1,800 tons of silk/year. However, domestic raw materials can cover only 30% resulting in demand higher than supply, pushing the price of cocoon highest in the history. From 1999 to 2003, the price of cocoon changed between VND 20,000 and 27,800/kg. In early 2004, the price has raised up VND 40,000/kg. The price of cocoon increases while the price of silk basically has no change. Therefore, many factories have to stop production or even close door.

2. Mulberry growing and silkworm breeding in Quang Binh province in general and Tuyen Hoa district in particular:

2.1 Mulberry growing and silkworm breeding in Quang Binh:

Quang Binh province consists of 6 districts and Dong Hoi town, however, this industry has been established and developed only in Tuyen Hoa district.

2.2- Mulberry growing and silkworm breeding in Tuyen Hoa- Quang Binh

2.2.1 - Origin and growth process:

Mulberry growing and silkworm breeding has been imported and developed in Tuyen Hoa for 12 years. Location which has the longest history in this industry is Chau Hoa, the commune located in the riverside. In recent years, implementing the policy on changing structure of crops and field gathering, Tuyen Hoa DPC guided some communes to change some areas of cashcrop into mulberry growing and silkworm breeding. So far, in Tuyen Hoa district, following communes deal with mulberry growing and silkworm breeding: Chau Hoa, Mai Hoa, Phong Hoa, Thach Hoa and Tien Hoa, with total area of 91.5 ha. Detailed data of above communes is shown in the following Table 1:

Commune	Total number of households	Number of hhs dealing with mulberry and silkworm	Area of mulberry growing			Yield of cocoon in 2004 (Kg)	Productivity value in 2004 (VND 1000)
			2002	2003	2004		
Mai Hoa	1,233	151	37.77	37.77	11.52	9,358	243,308
Phong Hoa	1,063	214	19.5	19.5	32	5,423	140,998
Chau Hoa	977	110	39.5	39.5	11	4,194	109,044
Thach Hoa	1,179	195		12	24.2	2,955	76,830
Tien Hoa	1,635	37		5	17	1,225	31,850
Total					91.5		
Newly involving communes							
Thanh Hoa					13.6		
Duc Hoa					8.9		
Thuan Hoa					5.5		
Cao Quang					3.5		

Among the above communes, only Chau Hoa has 10 years of experience in this industry, the others just have from 2-4 years. To involve more participation of other communes and also to settle this industry, the DPC supported a financial part to buy mulberry variety. This financial support was 100% in 2002 and 50% in 2003. The DPC also instructed Agriculture and Cadastral department to conduct several training courses to transfer technique on mulberry growing and silkworm breeding. Besides, Agriculture and Cadastral department also contacted and supported communes to seek good mulberry varieties and silkworm-eggs.

Results collected from questionnaires delivered to 55 households who deal with mulberry growing and silkworm breeding in 3 communes of Chau Hoa, Phong Hoa and Mai Hoa show that mulberry and silkworm production gains higher economic benefit than rice or cash-crop production. However, 100% of households agreed that they still lack of technique, especially in term of disease prevention and treatment. These diseases affect much productivity and quality of cocoons. As calculated in 3 communes, only 348 kg of cocoons are harvested per hectare of mulberry while this figure in other provinces is 750 kg on average (Data source: Vietnamese Corporation of Mulberry, Silkworm and Silk- Viseri). Among 55 surveyed households, yield of cocoons varies from 25 kg (lowest) to 250 kg (highest), most of them gained from 60 – 100 kg in 2004. Most households have the area of mulberry growing from 4 sao to 6 sao (2 sao minimum and 15 sao maximum). Average data on yield and income at household level in these 3 communes is shown in Annex 1 (attached to this report).

2.2.2 - Product and consumption market:

Having the same situation with domestic industry of mulberry and silkworm (In 2004, price of cocoons suddenly boomed as compared to the years 2002 and 2003), in 2004 the price of cocoons sold in Tuyen Hoa is VND 26,000/kg, increased very much as compared to the price of VND 18,000/kg and VND 16,000/kg in 2003 and 2002 respectively. Before 2004, mulberry growers and silkworm breeders in Tuyen Hoa sold cocoons to processing enterprises from Quang Nam, Da Nang and Vinh. In 2004, the silk production enterprise in Tien Hoa commune was established and permitted by the DPC to make monopoly of cocoon purchase in Tuyen Hoa with a fixed price of VND 26,000/kg. Got to know that capacity of this enterprise is small, sometimes it can not purchase all the quantity of cocoons harvested in the district so people in some communes have to lay off crops.

2.2.3 Economic benefit of mulberry growing and silkworm breeding

Item	Quantity	Unit price (VND)	Per 1 ha of mulberry
			Expense in cash (VND)
Mulberry seedling	3,500 kg	300	1,050,000
NPK fertilizer	200 kg	700	140,000
Cattle manure	5,000 kg	200	1,000,000
Growing, tending	270 person days		
I. Total cost			2,190,000
II. Production value	350 kg of cocoons	26,000	9,100,000
III. Net income			6,910,000
IV. Net income per person per day	VND 6,910,000/270 person days		VND 25,600 per a person day

* Not counted for income from maize intercropping

2.2.3 - Household development plan and policies of local government:

During the survey, 55 households in 3 communes of Chau Hoa, Phong Hoa and Mai Hoa revealed that income from mulberry growing and silkworm breeding is higher than other productive activities. 54 of 55 households have the plan to maintain and develop this industry. Their suggestions to authorities mainly focus on following issues: rearranging the area of mulberry growing; conducting training courses on techniques of mulberry growing and silkworm breeding; supporting to buy medicine for mulberry plant and silkworm; ensuring the supply of good quality mulberry seedlings and silkworm-eggs; providing credit for production; supporting to seek market for cocoons.

The DPC of Tuyen Hoa laid down as a policy the rearrangement of zones for mulberry growing and silkworm breeding, expanding over other communes such as Thanh Hoa, Duc Hoa, Thuan Hoa and Cao Quang. The DPC also instructed Agriculture and Cadastral department to contact and find supply sources of silkworm-eggs and mulberry varieties based on the real demand of communes. This department also supported communes to find consumption market as well as to negotiate with customers.

2.2.4 - Remarks and suggestions:

a. Remarks:

In recent years, Vietnamese silk industry has expanded its market to many countries in the world. Its products are esteemed and really gained high prestige. Consequently, demands on cocoons for processing and wearing factories increased; the price of cocoons boomed and mulberry growers and silkworm breeders earned higher income than before. Locations all over the country and Tuyen Hoa district have focused on expansion and development of this industry. In overall, both the domestic and export prices of silk do not increase much, the price of cocoons booms so mulberry and silkworm breeders earn higher benefit than silk processing and production factories.

Mulberry and silkworm industry in Tuyen Hoa has begun to stabilize and develop but still show many restrictions. Productivity of cocoons is low, only 350kg/ha (Average productivity nation wide is 750 kg) due to many reasons, of which technical weakness is the main reason. Otherwise, people still use degenerative mulberry varieties and silkworm eggs such as Sa Nhi Luan which was used and replaced tens of years ago in China. Accessibility to market as well as negotiation capacity of local people is still insufficient, the price of cocoons is much lower than national market price (only VND 26,000/kg as compared to VND 39,000/kg).

b. Recommendation:

In order to expand and develop mulberry growing and silkworm breeding industry in Tuyen Hoa district, following issues need to be considered and solved:

- Study and consider to rearrange areas where are suitable and potential for mulberry growing and silkworm breeding (It is possible to contract consultants from Universities, Research Institutes or Viet Nam Silk Corporation to expand this industry to other communes in Tuyen Hoa district).
- Conduct technical training courses to households who deal with mulberry and silkworm, focusing on techniques of disease prevention and treatment. Train a group of technical staff at district (staff of Agriculture and Cadastral department and Agricultural Extension Station) and commune levels.
- Strengthen relations with several institutes (Viet Nam Silk Corporation, Silk Faculty of Ha Noi Agriculture University and others) to seek mulberry variety and silkworm-eggs of good quality.
- Support processing enterprise in Tien Hoa commune, Tuyen Hoa district on the basis of ensuring benefit of farmers.
- Strengthen experience exchange among communes; support to establish mulberry growing and silkworm breeding club or association in Tuyen Hoa to prevent unhealthy competition or price obstruction.

CHAPTER IV – MEDICINAL PLANT “CHI XAC” (CITRUS St. FAMILY)

1. General information about demand and pharmaceutical production in Viet Nam in recent years:

In recent years, people have changed their awareness on using medicinal herbs for health care. Previous treatment by mainly using drug (usually named as Western medicine) is now replaced with popular remedies of oriental medicine, Chinese traditional medicine and Vietnamese traditional medicine (traditional medicines prepared in Vietnam and other Asian countries). Main reason of this change is i) products of drug take fast effect but often cause side effects not good for health, ii) drugs are very expensive. In Viet Nam, as surveyed by Pharmaceutical Department- Ministry of Health, cost of drugs per person per year is USD 5. Medicinal herbs are much cheaper. Though they take slower effect but they can fully treat diseases and cause no serious side effect. This change of awareness increases the demand on using medicinal herbs, especially in South-East Asian countries such as Korea, China, Vietnam ...

In recent years, Vietnam has also sought market to export products of medicinal herbs. Exporting medicinal herbs brings about foreign currency for our country as well as increases income of farmers and improves their living.

As for domestic market, a great quantity of medicinal herbs is demanded for:

- Traditional medicine;
- Modern medicine;
- Industry, Cosmetic, Food.

2. Some potential medicinal herbs in Quang Binh:

- Amomum: high valuable in the manners of both medicine and economy. As evaluated by experts, Amomum is now in great demand. This herb is rare so its price is very high; its main markets are Ha Noi and Ho Chi Minh cities where there are most Chinese traditional pharmacies. In Quang Binh, Amomum mostly grow in mountainous regions of Tuyen Hoa and Minh Hoa districts. It is mainly exploited from natural forest.

- Chi Xac: in medicinal aspect, this herb does not have a very high value. In the north, demand on Chi Xac is not very high. However, at present, in the south, especially Ho Chi Minh city Chi Xac is purchased in bulk to extract raw material for manufacturing Vitamin C. In Quang Binh, Chi Xac is planted in Tuyen Hoa district, mainly in Huong Hoa commune.

- Artemisia: Demand on using Artemisia is great, especially in Summer. From long time ago, people have had a habit to drink Artemisia water for antipyretic purpose. Artemisia is also one component of Chinese traditional medicine. At present, both state-owned and private pharmaceutical companies are buying dry Artemisia to process. Besides, Artemisia growers can also sell directly their products to consumers. In Quang Binh, Artemisia can be found in most locations provincial wide.

Based on real conditions of the project, we just focus our study on Chi Xac product, after then give out our detailed remarks and recommendations.

3. Key elements affect production of Chi Xac fruit in Huong Hoa commune, Tuyen Hoa district, Quang Binh province.

3.1. Natural condition:

Huong Hoa commune is located in the North of Quang Binh, bordered with Ha Tinh and Nghe An provinces, and has very favourable conditions in terms of climate, weather and soil for development of Chi Xac plant. Through the survey, Pharmaceutical Institute - Ministry of

Health has affirmed that locations in the North of Central Region (Ha Tinh province and neighbour areas) belong to the planned zone of Chi Xac production.

3.2. Labour:

Local labour force is abundant, however this potential has not yet exploited because there are few productive activities. Farmers are eager for an effective activity so that they can improve their household economy.

3.3. Source of seed:

At present, growing of medicinal plants has not become popular so seeds are not an urgent need. However, when this production is carried out in manners of intensive and commodity farming, quality of seeds will attract a great attention.

3.4. Transport:

Transport is in favorable condition. Ho Chi Minh highway and national road 15A create a good condition for goods exchange to and from this location.

4. Some general information about Chi Xac product:

4.1. Description:

- Name: Chi Xac fruit (Con fruit)
- Species: Belong to orange species.
- Origin: Indigenous plant.
- Use: Raw material to produce Chinese traditional medicine (Medicinal material)
- Use value: To extract material for producing Vitamin C and adjuvant of Chinese traditional medicine.

4.2. Growing status of Chi Xac in Huong Hoa commune

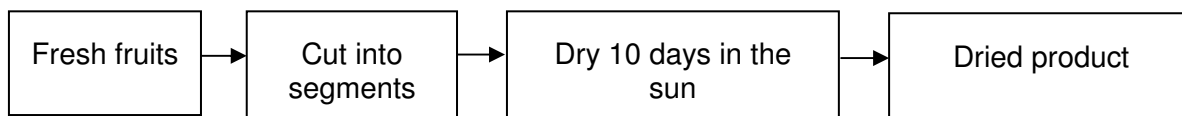
Chi Xac is a species often planted in rows as hedges to protect the garden but also bring out income. However, there were few households made a garden of intensive farming of this species. In previous years, the price of Chi Xac was low and unstable, a great part of Chi Xac farming area was destroyed and replaced with other species. Recently, gardens of Chi Xac are recovered.

Hereunder some basic information:

- Total number of households in commune: 628
- Number of households growing Chi Xac: 300
- Existing area of Chi Xac cultivation: 12 ha (density 400 plants/ha).
- Harvest time: from May to August.
- Yield achieved:

Average productivity of 1 plant:	30 kg.
Density/ha:	400 plants
Existing area:	12 ha
Yield achieved:	
Raw yield:	
30 kg/plant x 400 plants/ha x 12 ha =	144,000 kg.
Dry yield (after being dried):	
144,000 kg x 20 % =	28,800 kg.

Production process: Chi Xac is a plant easy to cultivate and to tend but brings back high productivity. People can learn techniques of cultivation and tending, and can produce seed by themselves. However, to control insects is still an important issue. Necessary tools for processing are not available so processing is implemented in a very simple way as below:



Until now, harvesting, processing and maintenance of Chi Xac product have been mainly implemented by women and children in hand-made method. Due to characteristics of the product as well as natural condition, during drying period, the product often gets wet with rain so rate of spoil is high, sharing 30%. Most farmers are afraid so they often sell their fresh product right after harvesting at a very cheap price as compared to which of dried product.

Market price of fresh fruit: VND 1,500/kg.

Market price of dried fruit: VND 7,000/kg.

(Price information provided by local people).

4.3. Market and market forecast in coming years:

According to the report on assessment of medicinal herb market in 2000 under IFSP by MA Hoang Cong Dung, natural source of medicinal herbs in the North of Central Region (including Thanh Hoa, Nghe An, Ha Tinh and North Quang Binh) consists of Amomum, Artemisia and Chi Xac. Main market of Chi Xac is Ho Chi Minh city.

Chi Xac is raw material not only for producing Vitamin C but also for Chinese traditional medicine. Beside Southern provinces and Ho Chi Minh city, there is also a great market in neighbour provinces.

The market of medicinal plants during the last years remarked the increasing tendency of using products from medicinal plants from inheriting the traditional health treatment methods, remedies and researches of new treatment methods and remedies. Apart from that, the demands for medicinal plants export are increasing. However, the amount of medicinal plants is still not enough for the domestic demands and Vietnam has to import a rather big amount of medicinal plants from China, Korea and Taiwan.

In fact the product of Chi xac produced in Huong Hoa commune does meet the local demand. The market knowledge of the majority of local population in the survey area is still limited and passive, leading to the fact that the majority of households produce and harvest Chi xac based on individual orders from other areas; and when out of these orders the production is also stopped. Only some people who still plant it seek the market themselves. The price is increased from 100 VND/kg of fresh plants to 2,000 VND/kg of fresh plants. The consumption of Chi Xac include a number of middlemen, from the ones who collect it in the local area and sell to the middlemen in Vinh city who will transport and sell it to the big units in Hanoi, after that it is sold to the Traditional Medicine Shops or Pharmaceutical companies to extract it for vitamin C.

4.4 Orientation for production:

In the recent years, due to the stable price, harvested Chi Xac amount is not enough for the market so that the majority of local people have tended to establish gardens for Chi Xac plantation. The area of Chi xac plantation has been increased year by year, of only 8 ha in 2002 up to 12 ha in 2004. The local authority has paid more attention to Chi Xac plantation and considered it as the major plant offering the economic effect in the restructuring the species in the local area.

5. Remarks and recommendations

5.1 Remarks

Chi Xac is a species easy to plant, high resistance to pests or diseases, offering fruits for many years. Currently, the majority of the households planting Chi Xac earn the major income from it. The yield harvested is rather high, about 30 tons of dry plants/year. However, no attention is paid to select good seedlings of Chi Xac which can give high productivity with the fruits of high quality and is suitable with the local conditions. The consumption including many middlemen makes the price sold out by the planters so much lower than the price at the final consumption place. The loss after harvesting is huge, 30% of the total product amount is broken and excluded.

5.2 Recommendations

Big markets should be sought out in Vitamin C production factories, big traditional medicine units in Hanoi and Ho Chi Minh for introduction of the product, negotiate and sign contract for supply on an annual basis.

The producers should be supported in application of simple-based and low cost drying technology, brick-kiln drying technology organized on household-based or village manner; conduct experiments if the product is accepted by the market.

Review and planning should be done, based on the market demands, in chi xac plantation area in hilly gardens, barren land and in provision of technical trainings for local people, multiplication of seedlings and selection of the species available in the local area for new plantation.

CHAPTER V – MUSHROOM PRODUCTION

1. Overview of the mushroom production in Vietnam in the last years

In the last 10 years, the mushroom production in Vietnam has been considered as a high productive activity. Due to the recent large transfer of technology in Vietnam, many mushroom production specializing areas have been established, such as in the southern mainly straw and cat ear mushroom species are produced; and “Mo”, Huong and Oyster mushroom species are produced in northern provinces of Ha Tay, Hung Yen, Bac Giang and Hai Duong. Furthermore, many areas in the central such as Quang Tri, Quang Nam and Da Nang provinces have started to establish mushroom spawn and mushroom production enterprises, with the estimated yield of 1,000 tons/year.

The mushroom products have been newly considered as a clean, safe and nutrients-rich vegetable species, making it quickly consumed in the market. Nevertheless, the production in Ho Chi Minh city and southern west provinces focuses on straw species with the average productivity of 100,000 tons while “Meo” and “Bao ngu” species are available market but there is no production and supply. Many mushroom units have to use spawn from unclear source, degraded and offering low productivity.

Presently, the total yield of different mushroom produced in Vietnam reaches around 100,000 tons/year. In 2004, Vietnam exported 50,000 tons of mushrooms, gaining the turn-over of \$40 million.

Due to the uniform research programs of mushroom spawns, process of production, patterns in organizing for production, the mushroom production in the five recent years has been stable and further developed in enterprises, farms and households. The total of mushroom production in the whole country is 100,000 tons/year, achieving the value of 1,500 billion VND/year (of which 40% exported, equivalent to \$40 million) and creating jobs for about 100,000 people with the rather high income compared with that in other agricultural activities (who only earn 15,000-20,000 VND/day). Regarding to the northern provinces alone, the mushroom productivity over the last 5-7 years has increased by 220 times compared with that in 1996. Currently, the scientific and technology organizations are researching the scientific basis for develop a mushroom production village with the aim to achieve the program of 1 million tons of mushrooms/year (costing \$1billion) in 2010.

Vietnam has been assesses as having the advantages in the geological and natural conditions suitable for producing mushrooms of high productivity and quality, completely meeting the domestic and abroad demands. However, the mushrooms produced in Vietnam has high quality but the export value is only at 60% compared with the that of the mushrooms produced in Thailand and China.

Currently, the mushrooms in the markets are defined by the specific names of their categories but not specific trade mark so that the users can easily recognize the product sources.

The mushrooms produced in Vietnam could take the similar risk like rice, tea, coffee and cashew when the Vietnam mushroom producers have to see the foreign enterprises process and package the Vietnam products with new labels and then sell them with so much higher price.

The price of mushrooms in the international market is sill high: “Mo muoi” mushroom costs around \$1,200/tons; cat ear, “Huong” and straw mushrooms costs from \$1,700-\$6,500/ton. Meanwhile, the price of mushroom produced in Vietnam is very low due to a number of reasons such as low-quality and low-productivity spawns ... From this fact, if the mushroom production might be balanced between the quantity and quality, it would result a large market in comparison with the big markets such as America, Japan, European ...

2. Situation of the mushroom production in Quang Binh over the last years

With the concerns and supports for the governmental institutions, national and foreign projects, the technology transfer program for eatable and medicinal mushrooms has been largely conducted on many areas of the whole province; it has obtained defined achievements. From importing the mushrooms from outside province, the province has so far been able to provide the mushroom products with big quantity. There are around 150 mushroom producers in the province; and the producers gain an effective productivity accounts for 90%. Annually, the quantity of mushrooms supplied to the markets attains 150-180 tons. The produced mushroom species are mainly; Oyster mushroom, covering 60%, straw mushroom – 15%, cat ear – 25% and medicinal mushroom species are only produced by some households as a good market for it is not found yet.

There has been a mushroom spawn production center that provide spawns to the involved households in the area (Job Promotion Center of Youth Union). Apart from the purpose of providing mushroom spawn, the center is also responsible for transfer the mushroom production technology to all areas in the entire province. Nonetheless, the training and transfer of the technology has not been uniformly organized, resulting in low effects. The number of people trained is rather great but the number of people actually starting the production is limited. Therefore, it makes the imbalance between the production and supply of the products in the local market.

3. Basic factors influencing to the mushroom production in Tuyen Hoa and Minh Hoa districts

3.1 Natural conditions

Quang Binh has the tropical climate, with average temperature from 24 – 25⁰C. It is rather suitable with the biological conditions of different types of mushroom, such as Cat Ear, Rice Straw and Oyster Mushrooms.

The soil conditions, in general, does not affect to the development of mushrooms since it is not directly planted in the soil. Mainly, the mushroom production requires land area. In the districts like Tuyen Hoa and Minh Hoa, the mixed garden land area is still abundant, possible to be used for sites of mushroom production.

3.2 Labour

The local labour force is plentiful but has been not yet fully used due to the fact that the local economic activities have not developed. Whilst the labour required for mushroom plantation, tending and harvesting only accounts for 30 -35% of the total time input for agricultural activities on a big scale. At the moment, the local people are eager to be able to apply an effective production activity that can offer productive outputs for self-development of household economy.

3.3 Source of mushroom spawns

Currently, there is a mushroom spawn production unit in the local area; however, the sources of the spawns are rather many, such as from Thua Thien Hue province and Hanoi who are able and ready to provide the spawns to the central provinces. Investment for mushroom spawn production is not high and local farmers can afford. The cost for purchase the spawns is around 35,000 – 40,000VND/1m³ of timber/time.

3.4 Materials

The major material for Straw mushroom production is straws from agriculture production and for Cat Ear and Oyster mushrooms is soft timber species such as “Va”, “Sung”, Jackfruit and Rubber. It can be developed of Cat Ear and Oyster mushrooms in Tuyen Hoa and Minh Hoa

districts since the mixed timber species in Group 7 can be collected from improving of mixed home gardens as well as cut from the forests due to low value of these species.

3.5 Transportation

The transportation to the districts is convenient, with Ho Chi Minh Highway 15A crossing the commune area, creating favorable conditions for good circulation and transportation to other areas.

4. Current situation of the mushroom production in Tuyen Hoa and Minh Hoa districts

With the support of IFSP, in November 2000 40 farmer households in Tuyen Hoa and Minh Hoa districts had been trained in mushroom production techniques. In 2004, the provincial Youth Jobs Promotion Center provided technical transfer in mushroom production to 31 households in Minh Hoa district. Until now, the number of mushroom production households in both Tuyen Hoa and Minh Hoa is 14 (12 in Minh Hoa and 2 in Tuyen Hoa), of which 6 households are practiced the mushroom production on a stable basis and gained related experience from 2000 and the remaining has been trained and started the production in 2004. These households are mainly in Hoa Hop, Hoa Tien and Xuan Hoa communes in Minh Hoa districts and Mai Hoa and Hoa Tien in Tuyen Hoa district. Types of mushroom produced are mainly Oyster, Straw and Cat Ear mushrooms, with the quantity of 2.5 tons/year.

The interviews to some mushroom production households revealed that their applied techniques are not ensured; diseases such as: Mould-green infection and miscellaneous fungi infection often prevail to mushrooms and not prevented or controlled. The tools for mushroom production, mainly the tools for treatment of mushrooms after harvesting are still insufficient. The production period of mushrooms is predominantly from April to December (lunar calendar). The mushrooms harvested are largely sold right at the households to the traders or at commune and district markets. It indicates that the demand for mushrooms in Tuyen Hoa and Minh Hoa districts is very high, especially at major markets such as markets of Quy Dat, Dong Le, Trung Hoa and Tien Hoa and the products harvested are not enough for the demand. Due to the regularly stable price of mushrooms, farmer households often have stable investments for mushroom production. However, under the effect of regular weather change, rate of decayed mushrooms during its growth period is rather high, from 5 - 10 %. The income from mushroom production covers 30 – 35% of the total household incomes.

4.3 Current market and market forecast of mushroom products in the coming years:

Production and supply:

The number of areas, individuals, groups and organizations involved in mushroom production is continuously increased. The current mushroom production units tend to intensive investments for increased of productivity and quality of products. These investments are suitable with the natural conditions for the production of specified mushroom species, e.g the southern provinces focus on production of Straw and Cat ear mushrooms and the northern provinces – straw, oyster, cat ear and mushroom species. The production enterprises tend to meet the domestic demands and concurrently make efforts to increase the export volume by increased product quality and focused processing and preservation. According to the indicator set by the national program for eatable mushrooms production, the yield of mushroom production must reach 1 million tons/year by 2010.

Market demands:

Along with the economic development of the country, the incomes of the people are increasing. When the increased incomes lead to higher demands for commodity consumptions, including food stuff in general and eatable mushrooms in particular. In addition, the mushroom is a clean food since no chemicals, pesticide, is used during the production period with the purpose of meeting the requirements for clean products by consumers. It can be affirmed that the demands for eatable mushrooms are increasing. Apart from the domestic market that has the potential number of customers up to 80 million people

, especially the city customers, the demands for mushroom export are promising once the mushroom products have been technically accepted by fastidious customers in Europe, American and Japan.

According to the forecast data of the survey in 2000 (by IFSP), with the population of 780,000 VND the annual demand is about 71.5 tons of dried cat ear mushroom. Currently, the supply is not much and insufficient to the demand. The market for mushrooms in general and for cat ear mushroom in particular is rather huge and is entirely able to give high income, due to the following reasons:

- The amount of cat ear mushroom provided to the local demand is mainly from outside provinces, with the price of 28,000 – 30,000 VND/kg, especially at the end or beginning of lunar calendar the price is sometimes increased to 35,000VND/kg.
- The mushroom consumed in the local market is in dried form, not packaged and preserved. The dried mushrooms are also not prepared in a good-looking form, making the users feel not tasty. The mushrooms in the local market can be partly used in fresh thanks to the near distance to the market. In addition, it can be also create different products with good looking forms if applied new technology processes. If so, then it can be competitive with other areas and its market is more largely covered.

4.4 Orientation for mushroom production

In recent years, as the price of mushroom products is continuously stable and at high value the products can not meet the local demand; As a result, the local households have a tendency to extend their production, investments for production site, be active in seeking for input and output courses and increase the product quality for meeting the users demand. The local authority has also paid attention and instruction for extension of the mushroom production, creating more jobs and increasing additional incomes for local people as one of the initial policies in the local economic development.

5. Remarks and recommendations

5.1 Remarks

Mushroom production is one of the activities offering high economic effect, making use of the by-products of agricultural production and at the same time producing a considerable amount of fertilizer. In the last years, the mushroom production has been sharply increased in the districts of the whole province, partly meeting the market demands. In Minh Hoa, the local mushroom production has been well developed but in Tuyen Hoa, the mushrooms are mainly provided from outside whilst the local demand is high. Therefore, to make full use of the local labour and materials, create jobs and increase additional income for households, development of off-farm activities in the rural area needs to be properly concerned by the local government and related international organizations.

However, the training and transfer of the mushroom production technologies has not been uniformly organized. The selection of trainees was not appropriate so that the number of trainees actually producing mushrooms covers a low percentage of the total number of trainees. Furthermore, the local people have not paid attention in using eatable mushrooms, leading low consumption and not encouraging the mushroom producers.

5.2 Recommendations

In order to develop the local mushroom production in Tuyen Hoa and Minh Hoa districts as well as in other districts in the whole province of Quang Binh, proper consideration should be attached to the following issues:

- √ Strengthen surveys in the areas with available materials and market for related information and data to support the extension of mushroom production.
- √ Organize study tours for local people who are interested in effective demonstrations of eatable mushrooms and medicinal mushrooms in the province.

- √ Conduct technical trainings on mushroom production based on improved technology/method for interested people (trainees should be the ones who actually have demands, able to organize the production after the training).
- √ Support the households who have mushroom productions for experience sharing after the implementation (in form of specific trainings and specific areas).
- √ Conduct advanced training on mushroom production techniques, especially how to prevent and control disease and how to harvest for high productivity for commune and district extension workers ensuring the regular technical guidance and consultancy to mushroom producers.
- √ Support in the introduction of harvesting and preserving technology ensuring longer duration of mushroom freshness and drying technology.
- √ For the districts with rather high mushroom producers, support is needed to the producers with effective production and abundant experiences for establishing mushroom spawn supply unit, supply of technical tools and medicines for mushroom diseases.
- √ Strengthen the exchange of knowledge and experience, dissemination and communication of the mushroom production effects through mass media.

Annex 1

Summary of information and data of the bee keeping in the communes in Tuyen Hoa and Minh Hoa districts

Yield of honey harvested (Kg)

Communes	No. of bee keeping households	No. of bee keeping households applying traditional method	2004	2003	2002
Hồng Hóa	21	0	400	320	250
Hóa Hợp	130	0	470	640	580
Hóa Thanh	37	0	0	0	0
Yên Hóa	24	0	400	320	280
Minh Hoá	30	0	250	180	150
Thượng Hóa	12	0	220	150	110
Xuân Hóa	30	0	2900	2300	3200
Dân Hóa *	3	0	0	0	0
Quy Hóa *	5	0	0	0	0
Hóa Phúc *	8	0	0	0	0
Hóa Tiến *	13	0	0	0	0
Trung Hóa *	12	0	0	0	0
Tân Hóa *	19	0	0	0	0
Hóa Sơn *	2	0	0	0	0
Thuận Hóa	177	0	950	1031	1370
Phong Hóa	27	70	617	515	390
Mai Hóa	2	47	534	420	360
Đồng Hóa	11	6	1180	1056	2020
Châu Hóa	2	0	24	30	36
Lê Hóa	10	0	165	334	175
Hương Hóa	15	3	25	78	82
Đức Hóa *	16	0	0	0	0
Sơn Hóa *	28	0	0	0	0
Thạch Hóa *	7	0	0	0	0
Thanh Hóa *	18	0	0	0	0
Đồng Lê township *	6	0	0	0	0
Tiến Hóa *	6	0	0	0	0
Văn Hóa *	12	0	0	0	0
Cao Quảng *	0	0	0	0	0
Kim Hóa *	1	0	0	0	0
Lâm Hóa *	0	0	0	0	0
Ng Hóa *	0	0	0	0	0
Total	684	126	8135	7374	9003

*Note: The communes marked with * are where the survey was not conducted, but the data mentioned were referred to the survey in 2001.*

Annex 2

Summary of information and data of the bee keeping in the communes In Minh Hoa district

District	Commune	Village	Name of household owners	No. of men in hh (per.)	No. of women in hh (per.)	Ethnic group (1-Kinh, 2-minotiry)	No. of labourer	Period of keeping bee (year)
MH	Hóa Hợp	Tân Sum	Lê Quang Hiếu	1	3	1	2	1
MH	Hóa Hợp	Lâm Sum	Phan Hồng Nhung	4	2	1	4	3
MH	Hóa Hợp	Tân Sum	Đình Thanh Bình	3	1	1	3	2
MH	Hóa Hợp	Đa Năng	Đình Chí Ván	5	1	1	3	3
MH	Hóa Hợp	Đa Năng	Đình Ngọc Tuyên	2	2	1	3	2
MH	Hóa Hợp	Lâm Sum	Đình Thanh Niên	3	3	1	3	3
MH	Hóa Hợp	Đa Năng	Đình Minh Tiến	5	2	1	3	3
MH	Hóa Hợp	Tân Sum	Đình Xuân Điều	2	1	1	2	3
MH	Hóa Hợp	Lâm Sum	Cao Thanh Sơn	1	1	1	2	3
MH	Hóa Hợp	Lâm Sum	Đình Chiên Vê	3	3	1	4	4
MH	Hóa Hợp	Tân Sum	Đình Xuân Viết	4	2	1	3	3
MH	Hóa Thanh	Lâm Thanh	Cao Thanh Sơn	2	6	1	5	8
MH	Hóa Thanh	Lâm Thanh	Phạm Long Sắc	3	3	1	3	8
MH	Hóa Thanh	Lâm Thanh	Trần Duy Hng	7	2	1	6	2
MH	Hóa Thanh	Lâm Thanh	Đình Xuân Đồng	2	2	1	2	8
MH	Hồng Hóa	Văn Hóa	Cao Lương Giao	2	4	1	1	6
MH	Hồng Hóa	Quảng Hóa	Đình Xuân Hậu	4	3	1	4	3
MH	Hồng Hóa	Quảng Hóa	Đình Long Kỳ	4	4	1	2	3
MH	Hồng Hóa	Văn Hóa	Cao Ngọc Thương	3	3	1	3	3
MH	Minh Hóa	Tân Lý	Trương Văn Khánh	3	2	1	3	8
MH	Minh Hóa	Tân Lý	Trương Hữu Dơng	3	2	1	4	8
MH	Thượng Hóa	Phú Nhiêu	Trương Văn Dợc	2	2	1	3	6
MH	Thượng Hóa	Tiến Nhất	Cao Xuân Quyền	2	2	2	4	6
MH	Thượng Hóa	Tiến Nhất	Đình Xuân Đào	3	2	3	5	6
MH	Thượng Hóa	Tiến Nhất	Đình Xuân Niêm	2	2	1	2	6
MH	Thượng Hóa	Phú Nhiêu	Đình Văn Hiệu	3	2	1	2	6
MH	Xuân Hóa	Hợp Lợi	Đình Phúc	3	2	1	4	6
MH	Xuân Hóa	Ba Nơng	Đình Xuân Hiếu	2	3	1	3	8
MH	Xuân Hóa	Ba Nơng	Đình Minh Sự	1	4	1	2	7
MH	Xuân Hóa	Cây Da	Đình Ngọc Khuê	1	2	1	2	2
MH	Xuân Hóa	Ba Nơng	Đình Văn Phong	2	2	1	4	4
MH	Xuân Hóa	Cầu Lợi 1	Đình Xuân Kiều	2	2	1	3	6
MH	Xuân Hóa	Tân Xuân	Đình Long	5	5	1	3	7
MH	Yên Hóa	Yên Bình	Đình Sơn Hải	2	3	1	2	2
MH	Yên Hóa	Yên Bình	Đình Xuân Cứu	2	2	1	3	4

MH	Yên Hóa	Tân Tiến	Đình Xuân Ng	4	3	1	5	5
MH	Yên Hóa	Tân Tiến	Cao Minh Đức	3	1	1	3	5
MH	Yên Hóa	Yên Bình	Đình Xuân Thế	2	4	1	5	7
TH	Đồng Hoá	Đồng Phú	Nguyễn Văn Minh	4	1	1	5	4
TH	Đồng Hoá	Đại Sơn	Nguyễn Văn Khoa	1	2			
TH	Đồng Hoá	Thuận Hoan	Nguyễn Văn Đại	2	3	1	3	4
TH	Đồng Hoá	Đồng Phú	Trần Trung Hiếu	2	3	1	5	5
TH	Đồng Hoá	Thuận Hoan	Nguyễn Đức Quế	2	4	1	3	4
TH	Đồng Hoá	Đồng Phú	Hoàng Minh Tróc	2	5	1	6	5
TH	Đồng Hoá	Đại Sơn	Nguyễn Đình Phu	3	3	1	2	5
TH	Đồng Hoá	Đồng Phú	Nguyễn Đăng Khoa	2	2	1	3	5
TH	Đồng Hoá	Đồng Phú	Hoàng Văn Sơn	2	2	1	2	5
TH	Châu Hóa	Uyên Phong	Trần Địch	2	1	1	1	3
TH	Châu Hóa	Lâm Lang	Mai Văn Kế	2	1	1	1	6
TH	Hưng Hóa	Tân Đức 3	Trần Văn Hòa	3	1	1	4	3
TH	Hưng Hóa	Tân Đức 4	Bùi Văn Tùng	2	2	1	2	3
TH	Hưng Hóa	Tân Đức 1	Ngô Văn Minh	2	2	1	2	3
TH	Hưng Hóa	Tân Đức 3	Đình Văn Khoa	2	3	1	3	3
TH	Hưng Hóa	Tân ấp	Nguyễn Hồng Tâm	3	1	1	2	3
TH	Hưng Hóa	Tân Đức 4	Đình Văn Bìa	3	2	1	5	4
TH	Hưng Hóa	Tân Đức 1	Trần Đức Minh	1	3	1	4	3
TH	Hưng Hóa	Tân Đức 1	Đình Minh Đức	1	4	1	5	3
TH	Hưng Hóa	Tân Đức 1	Võ Khỏe Lành	3	2	1		3
TH	Lê Hoá	Yên Xuân	Cao Thanh Phong	1	3	1	2	4
TH	Lê Hoá	Đồng Lê	Võ Văn Lơng	2	3	1	4	3
TH	Lê Hoá	Yên Xuân	Nguyễn Minh Kiểm	3	2	1	3	5
TH	Lê Hoá	Yên Xuân	Đình Xuân Th	1	2	1	1	6
TH	Lê Hoá	Đồng Lê	Phan Văn Thanh	3	2	1	3	10
TH	Lê Hoá	Đồng Lê	Trần Văn Đức	3	2	1	2	4
TH	Lê Hoá	Yên Xuân	Nguyễn Văn Hơng	2	4	1	4	7
TH	Lê Hoá	Yên Xuân	Đình Ngà	2	2	1	2	5
TH	Mai Hóa	Tây Hóa	Trần Bé	3	3	1	5	2
TH	Mai Hóa	Đông Thuận	Cao Hớng	4	2	1	2	2
TH	Mai Hóa	Đông Thuận	Nguyễn Vinh	2	2	1	2	4
TH	Mai Hóa	Đông Thuận	Hoàng Bằng	1	1	1		3
TH	Mai Hóa	Tây Hóa	Nguyễn Duy Hòa	2	2	1	3	5
TH	Mai Hóa	Đông Hoà	Hà Đức Thuận	1	5	1	3	8
TH	Phong Hóa	Sảo Phong	Cao Xuân Thiết	3	3	1	4	6
TH	Phong Hóa	Cầm Trang	Mai Xuân Huê	5	2	1	3	6
TH	Phong Hóa	Mã Thợng	Phạm Bá Sinh	4	3	1	6	7

TH	Phong Hóa	Sảo Phong	Nguyễn Văn Sinh	2	2	1	2	8
TH	Phong Hóa	Mã Thợng	Phạm Thanh Quế	3	2	1	3	6
TH	Thuận Hóa	Ba Tâm	Lê Văn Dinh	1	1	1	1	4
TH	Thuận Hóa	Trung Lào	Hoàng Thị Quy	3	1	1	3	4
TH	Thuận Hóa	Xuân Canh	Nguyễn Văn Học	2	3	1	3	4
TH	Thuận Hóa	Ba Tâm	Nguyễn Thế An	1	2	1		
TH	Thuận Hóa	Ba Tâm	Võ Văn Liễu	2	2	1	4	4
TH	Thuận Hóa	Ba Tâm	Phùng Hữu Cúc	1	1	1	2	4
TH	Thuận Hóa	Ba Tâm	Trần Xuân Vinh	2	2	1	3	4
TH	Thuận Hóa	Ba Tâm	Hoàng Văn Dinh	2	1	1	3	4
TH	Thuận Hóa	Ba Tâm	Trần Văn Thú	2	2	1	4	4
TH	Thuận Hóa	Ba Tâm	Hoàng Trọng Đại	2	1	1	3	4
TH	Thuận Hóa	Xuân Canh	Nguyễn Văn Thống	3	2	1	4	6
TH	Thuận Hóa	Hạ Lào	Trần Giang Nam	3	1	1	2	2
TH	Thuận Hóa	Thuận Tiến	Lê Văn Huyền	2	3	1	3	5
TH	Thuận Hóa	Xuân Canh	Nguyễn Hữu Long	1	3	1	4	3
TH	Thuận Hóa	Thuận Tiến	Hoàng Văn Bồng	1	1	1	2	4
TH	Thuận Hóa	Thuận Tiến	Hoàng Quý Tài	4	2	1	5	2
TH	Thuận Hóa	Trung Lào	Nguyễn Tấn Đức	4	3	1	6	6
TH	Thuận Hóa	Trung Lào	Nguyễn Thế Hữu	4	1	1	4	5
TH	Thuận Hóa	Xuân Canh	Lê Song Toàn	2	3	1	2	8
TH	Thuận Hóa	Xuân Canh	Lê Quang Vinh	4	2	1	4	6
TH	Thuận Hóa	Hạ Lào	Đoàn Xuân Quế	2	3	1	2	5
TH	Thuận Hóa	Xuân Canh	Nguyễn Duy Khâm	2	3	1	4	6
TH	Thuận Hóa	Trung Lào	Trần Hoàì Thanh	2	1	1	1	6
TH	Thuận Hóa	Trung Lào	Lê Đức Thiện	4	1	1	5	3
TH	Thuận Hóa	Ba Tâm	Nguyễn Hữu Chân	1	1	1		
TH	Thuận Hóa	Ba Tâm	Cao Văn Khánh	2	2	1	4	3
TH	Thuận Hóa	Thuận Tiến	Nguyễn Hồng Thanh	1	5	1	2	5
TH	Thuận Hóa	Xuân Canh	Phan Thanh Tuấn	2	2	1	3	6
TH	Thuận Hóa	Xuân Canh	Hà Văn Nhân	2	3	1	4	6
TH	Thuận Hóa	Đông Lào	Phan Văn Lân	4	1	1	3	5
TH	Thuận Hóa	Thuận Tiến	Trần Văn Sâm	1	3	1	3	6
TH	Thuận Hóa	Thuận Tiến	Trần Văn Đức	3	1	1	2	2
TH	Thuận Hóa	Thuận Tiến	Nguyễn ánh Hồng	4	1	1	5	4
TH	Thuận Hóa	Xuân Canh	Nguyễn Ngọc Châu	4	1	1	5	6
TH	Thuận Hóa	Thuận Tiến	Hoàng Bình	3	1	1	3	5
TH	Thuận Hóa	Trung Lào	Nguyễn Minh	3	1	1	3	5
TH	Thuận Hóa	Thuận Tiến	Lê Văn Tông	2	4	1	6	
TH	Thuận Hóa	Trung Lào	Nguyễn Quyết Chiến	2	2	1	3	5
TH	Thuận Hóa	Xuân Canh	Nguyễn Văn Thanh	1	3	1	4	5

Annex 3:

**Summary of the bee keeping data at household level
in Tuyen Hoa and Minh Hoa districts**

Commune	No. of labourer	Period of keeping bees (year)	No. of hives beeing kept	Yield of honey produced over years		
				2004	2003	2002
Tuyen Hoa district						
Lê Hoá	2,6	5,5	5,6	20,6	46,3	21,9
Hưng Hóa	3,4	3,1	6,2	3,3	16,1	18,3
Châu Hóa	1	4,5	3	21	24	22,5
Đồng Hoá	3,6	4,6	8,9	56,1	54,4	46,6
Mai Hóa	3	4	5,7	32,5	29,7	39,4
Phong Hóa	3,6	6,6	7,8	23,8	33,6	37,2
Thuận Hóa	3,4	4,6	4	19,8	30,6	31,9
Minh Hoa district						
Hồng Hóa	2,5	3,8	7,3	26,3	37	33,8
Hóa Hợp	2,9	2,7	3,2	14,5	27,7	20,5
Hóa Thanh	4	6,5	4,8	13,3	14,5	19
Yên Hóa	3,6	4,6	6,4	42,6	89	65
Minh Hóa	3,5	8	9	80	55	45
Thượng Hóa	3,2	6	5,6	35,4	24	11
Xuân Hóa	3	5,7	15,3	167,1	193,6	167,9
Average total of 2 districts	3,2	4,7	5,9	35,9	45,3	39,6

Annex 4:**Estimation of the demand for bee honey in Quang Binh province**

Unit: ton

District/city	Year 2000	2001	2002	2003	2004	2005
Dong Hoi	9	10	12	17	25	28
Le Thuy	8	9	10	12	17	19
Quang Ninh	5	6	7	8	10	12
Bo Trach	8	9	10	12	13	16
Quang Trach	11	12	13	14	16	18
Minh Hoa	0,7	1	1,3	1,5	2	3,5
Tuyen Hoa	0,7	1	1,3	1,5	2	3,5
Total	42,4	48	54,6	66	85	100

List of households producing mulberry and silkworm in Tuyen Hoa district

Commune	Village	Name of household owner	No. of men in hh	No. of women in hh	Ethnic group (1-Kinh, 2-minority group)	No. of labourer	Period of producing mulberry & silkworm
Châu Hóa	Kinh Châu	Phan Nguộc	1	1	1	2	2
		Đặng Đình Đào	1	3	1	1	11
		Nguyễn Túc	1	2	1	3	11
		Hoàng Cờng	1	3	1	2	11
		Đặng Xuân Huệ	2	2	1	2	5
		Phan Tiếp	1	2	1	3	10
		Phan Hoan	1	2	1	3	3
		Nguyễn Văn Cờng	2	2	1	5	3
		Lê Dờng	2	2	1	4	3
		Hoàng Mai	1	2	1	3	11
		Trần Thị Thuyờn	2	1	1	3	11
		Đặng Văn Linh	1	2	1	2	11
		Nguyễn Bảng	2	3	1	1	11
		Đặng Minh	3	2	1	3	11
		Nguyễn Văn Thanh	2	1	1	4	11
		Hoàng Đức Hoàn	3	1	1	2	11
		Nguyễn Thị Loan	1	1	1	3	2
		Đặng Ngọc Hoa	1	2	1	5	2
		Hoàng Văn Thuận	2	2	1	4	3
		Mai Hóa	Đông Thuận	Hà Thị Nghĩa	1	2	1
Võ Hồng Quân	2			3	1	2	3
Hoàng Hoàn	2			4	1	4	2
Trần Hiền	4			2	1	5	2
Hà Trọng	4			2	1	4	3
Hà Thanh Trung						4	3
Hoàng Vinh	3			3	1	2	2
Võ Sơn	2			2	1	1	11

		Nguyễn Mão	2	3	1	3	11
		Cao Thị Đa	2	4	1	2	3
	Đông Hoà	Hà Thế	2	4	1	4	11
		Trần Thanh Huyền	3	2	1	4	11
		Hoàng Lý	3	4	1	1	11
		Hà Văn Sáu	2	2	1	3	3
		Hoàng Ngoan	2	5	1	6	3
		Cao Thanh Tùng	3	4	1	6	3
		Trần Thị Tuyết	3	1	1	2	2
		Phạm Thị Loan	0	4	1	4	3
Phong Hóa	Cầm Nội	Nguyễn Quốc Toàn	1	3	1	4	11
		Phan Xuân Hiến	1	4	1	3	3
		Phạm Xuân Đàn	3	2	1	2	2
		Nguyễn Thanh Hoài	3	2	1	2	11
		Trần Tiến	2	4	1	6	2
		Nguyễn Thị Hiền	2	1	1	6	3
		Phạm Ngọc Đê	3	2	1	3	11
		Nguyễn Văn Thìn	2	2	1	2	3
		Nguyễn Văn Nam	2	4	1	6	4
		Nguyễn Ngọc Viêt	2	2	1	3	3
		Nguyễn Thanh Phong	3	2	1	2	3
Phong Hóa	Cầm Ngoại	Trần Trung Bình	3	4	1	3	11
		Lê Minh Lơng	2	3	1	3	3
		Võ Xuân Vinh	2	2	1	5	5
		Trần Văn Thụ	4	3	1	2	3
		Võ Xuân Đồng	4	1	1	3	3
		Phạm Văn Lập	3	3	1	3	3
		Trần Thị Thi	2	3	1	4	3

**Assessment of production of Mulberry and Silkworm at household level
in Chau Hoa, Mai Hoa and Phong Hoa communes, Tuyen Hoa district**

Commune	No. of labourers	Period of producing mulberry & silkworm	Yield of cocoons over years (kg)				Value of cocoons over years (1,000 VND)			Total income of hhs over years (1,000 VND)		
			2004	2003	2002	total (kg)	2004	2003	2002	2002	2003	2004
Chau Hoa	2,6	11	77,5	74,6	75,9	227,9	2.025,30	1.350,40	1.374,10	5.110,90	5.207,80	6.461,60
Mai Hoa	3,8	3,2	82,4	68,2	45,1	190,7	2.197,90	1.362,80	913,7	11.181,80	11.861,10	13.611,10
Phong Hoa	3,3	2,9	134,6	105,3	78,6	318,5	3.498,40	1.896,00	1.257,80	3.922,20	5.116,10	6.197,30
Average	3,2	5,8	97,8	82,5	67,5	245,4	2.563,90	1.533,00	1.201,00	6.056,40	7.355,20	8.714,90

* Note: Average data of 55 households over the years