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**GERMANY TECHNIQUE AND  
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**Agriculture product value chain component**

# **REPORT**

## **HUNG YEN PROVINCE LONGAN VALUE CHAIN ANALYSIS**

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## I. Background

Recently, our economy has been developing steadily. One of the reasons for the sustainability is that the agriculture sector which has been developing steady, still contribute high percentage into the national GDP. The process of the animal and crop pattern conversion in order to take advantage and to exploit land potential of each ecological regions has make the agriculture picture to be new feature with the new concentrated special and intensive agriculture product zone, that produced huge volume of goods for commercial to serve people's consumption demand.

The consumption demand development includes the high demand on quality and diversity of the products, and then the development of the special and high quality products is one of the orientations for sustainable agriculture development in Vietnam. One confliction presently existing is the market demand on special products such as litchi Thanh Ha, big longan Hung Nguyen, pomelo Phuc Trach... getting increase, the consumers getting difficult to buy the right products with high quality. At the same time the farmers faces to difficulties on production especially on products selling.

Recently, in Hung Yen town and its contiguous areas, longan, especially big longan area is expanding to replace the low and unstable productivity rice areas. The province produces the fresh and processed longan product not only enough for the province demand but also for other provinces and for export. However the existing longan value chain development brings the disadvantages for both producers and consumers, which are the confused products. The longan produced from different zones such as Nam Ha, Son La is using the same name of Hung Yen to sell their products. The Hung Yen longan value chain is not well organized, not yet brought the creditable of the product to the consumers. This makes the Hung Yen Longan market to be not all right, it does not really bring the benefit to the producers.

This reality requests the active supports on both technique and market organization, to ensure both for production development and for the benefit of the consumers. At the moment, there is not any research on the present development on the production and market of Hung Yen Longan, to be the basic for the specific action orientation.

In this context, the research on the development of the Hung Yen value chain has objectives to describe the product commercialization's picture, the difficulties and recommendations for the specific actions to support to production and market development for the longan in Hung Yen province.

### 1. Research objectives

The research objectives are: to describe the present production and selling longan in Hung Yen. To determine the trading system: determining the product value chain through the determining the activities of the different actors in the chain such as farmers, collectors, middle men, processors, traders, detail sellers. To evaluate the volume, characters, quality of the products, the consumers and market. From this the difficulties of the actors can be detected and to provide the suggestions to improve the commercialization of the longan value chain.

### 2. Research content

The research includes the evaluation and analysis on the producing and selling longan, the organization and the connection between the actors of the value chain in order to find the suggestion to improve the longan value chain.

### 3. Research methodology

- Step 1: Evaluating the development history of longan and the present situation of the production through statistical data and secondary documents collection.
- Step 2: Diagnosing the production system in order to classify the longan area, variety and farmer's techniques through discussion and information collection from the experienced specialists.
- Step 3: Making a longan market survey to evaluate the distribution on product trading, the value chains by products, and qualities to the different markets through the interviewing the trading, processing actors.
- Step 4: Synthesis, information analyzing and writing report.

## II. General information

### 1. Origin of the longan tree

There are some different opinions on the origin of the longan tree:

- According to Jonathan H. Crane, Carlos F. Balerdi and Steven A. Sargent , the longan trees (there are some popular names such as Lungan, Dragon eye, Mamoncillo chilo, Longana, Leng keng or Lam yai) belongs to Sapindaceae family which origins at Myanmar, South China, South western India, Srilanca and Indo-China peninsula.
- According to Groff: Longan origins in the South China (in the provinces Guangdong, Guanxi, Fukien, Sichuang...) then longan developed to other continents and countries in the world: in the year 1798, longan was introduced into India. In the year 1903 longan from China was imported to the south Florida state of US then was developed to the Caribe zone countries such as Bermuda, Puerto Rico and Cuba, then the countries in Africa, Australia, there longan trees were planted in farms, experiment stations for fruits, bonsai and shadows.
- According to De Candolle longan origins in India in the continental climate land. In Bangal and Assam states, longan was planted mainly in the land with altitude of 1000m. In Ghats the longan was planted in 1600m altitude and there is wild longan forest.<sup>1</sup>

#### **Research sites**

Hung Yen belongs to Red river Delta, in the crucial economy zone of the North (Ha Noi – Hung Yen – Hai Duong – Hai Phong – Quang Ninh). Hung Yen province borders on Ha Noi at northwest, Bac Ninh at northeast, Hai Duong at east, Thai Binh at South and Ha Nam at southwest. The province includes 160 administrative units of which 1 town, 9 districts, 145 communes, 6 wards. In the province land, there are the important transport ways such as the National roads 5 and 39A, the provincial road 39B, and Ha Noi - Hai Phong train way. The Hong (Red) and Luoc rivers systems are not only the convenient transport ways for good and human transport but also annually supply a huge amount of alluvium contribute to develop agriculture sector of the province. The province covers 92309.3 ha of natural land of which 63450 ha of agriculture land with population of 1113489, the population density of 1206 person per km<sup>2</sup>. (Annex)

<sup>1</sup> Professor – Dr. Tran The Tuc: Questions and answers on litchi-longan, Agriculture publishing house. Page 88

Hung Yen has the natural resource, climate and land, which favours to develop agriculture. The diversity of crops pattern especially fruit trees is one of the strong of the province. With the advantage of alluvium near by Hong river (Red river) and Luoc River, the Hung Yen is suitable to develop the high value fruit trees, especially big longan trees. Besides longan, the province also plants abundant fruit trees such as litchi, juju, orange, banana... (Table – Annex).

In last few years, the provincial crop sector has conversed totally on cropping pattern, seeds, seasoning and areas. This conversion process in parallel goes with intensive investment, increasing economic efficiency and especially the demand to fall in line in the market economy. The trees belonging to the strong of the province are paying attention to be developed. One of which is longan. Longan is traditional tree in Hung Yen and gives high economic value, the longan products can be fresh or processed for domestics and export (dried flesh longan). It can be say longan has been playing the role of strong tree of the province...

### ***Longan tree in Hung Yen province***

Hung yen has large area covering by longan trees with well known varieties such as Huong Chi, Duong Phen longan...At present the fruit tree area of the province is about 7500 ha of which the longan tree covers more than 5500 ha. Most of the trees in this area are mature and giving fruit. In the province the longan are planting mainly in Hung Yen town and Tien Lu district, and other districts with large area under longan such as Khoai Chau, Kim Dong, and An Thi. The annually longan production is 15-20 thousand ton that brings VND 150-200 billion of income, occupied 12-13% of provincial income from agriculture.

After re-founded province in the year 1997, Hung Yen has many active measures to push the longan development such as budget investment for technique sciences, collaboration with research institutes, universities, inviting specialists to transfer technique sciences on production, management and multiplying longan seedling. At the present, the province produces annually a ten thousand of longan seedling to supply not only enough to demand of the province but also to other provinces.

## **2. Area, productivity and production of longan of the province**

**Area:** One of the character of the fruit trees in general and longan in particular is the form of both concentrated and dispersedly planting in Hung Yen. Even in the concentrative zones there are mixed tree planting therefore it is difficult to measure a completion of area for each trees. According to the Provincial Department of Agriculture and People's committee, the longan area is about 5500 ha of which the concentrative area and dispersive area of longan are 2000 ha and 3500 ha respectively. However these figures are much higher that those according to the provincial statistics office as following table:

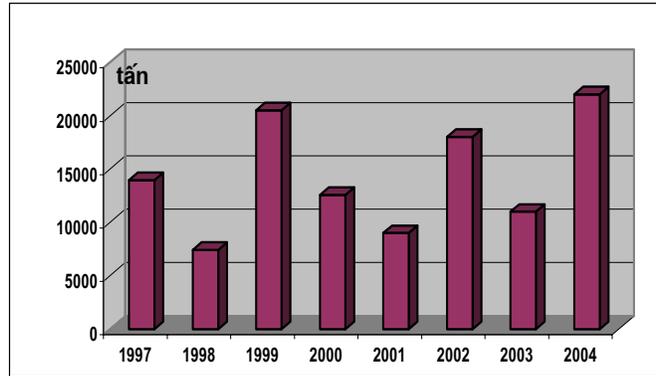
***Table 1: Area of longan of Hung yen province***

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
New planted tree area	58	95	40	33	133	135	367	176
Mature tree area	1225	1240	1315	1326	1470	2013	1937	2140
Existing tree area	1367	1410	1470	1502	1615	2384	2304	2480

According to this table, in 2004, the longan area of the province is about 2500 ha including litchi area of about 400-500 ha. May be these areas account only the concentrative area not yet accounted for the semi-concentrative which is equivalent about 3500 ha.

**Productivity:** Longan is the tree which its productivity depends much on the climate and weather condition. The reasons are that when longan blows in the raining season, then it is difficult for longan flowers to pollinate; or when the fruit growing and going to be harvest, the heavy rain and then sun light make the flesh and the cover of fruits growing with different rates then the fruit covers broken. Beside the different longan varieties produce different productivities.

**Production:** Since the longan productivity depends much on the weather then the annual longan production fluctuates not evenly, some years with low and some year with high production. Year 2004, the longan production obtained bumper harvest up to date with the production estimated 22000 ton. (Hung Yen Provincial statistic office, 2004)



**Graph 1: Longan production of Hung Yen**

### 3. Longan varieties in Hung Yen

The documents existing in the province show that the longan has been being planted in Hung Yen since 300-400 year ago. Nowadays, there are many different longan varieties planting in Hung Yen. Table 2 (Annex) shows the characters of longan varieties planting in Hung Yen.

Two longan varieties are evaluated as the highest quality by the producers and commercial actors are Huong Chi and Duong Phen. These longan varieties are planting popularly. In the new planting areas, the Huong Chi longan covers up to 90%.

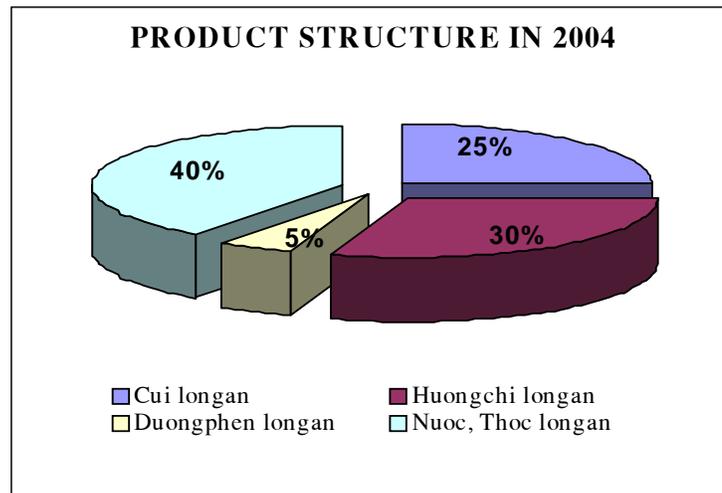


*Huong Chi longan:* This variety was selected by Mr. Huong Chi in Hong Nam ward, hung Yen town (former Hong Nam commune, Tien Lu district) in his garden. Huong Chi longan fruit is delicious, big and nice appearance and it's tree is low and produces high fruit productivity. By time this variety is been multiplying to the whole large zone and the local people named this variety as the one who selected it then it's called Huong Chi. Huong Chi is planting popularly nowadays since Huong Chi blows 2-3 times year round while other varieties blow only one time. Therefore if the flowers in one series are spoilt then other could be fruitful.

*Duong Phen longan:* This is precious longan variety. It can be said that Duong Phen is the most delicious and precious longan in Vietnam. Duong Phen longan fruit is small, with little dark colour cover; thick, no-water and aromatic flesh. Since in the flesh surface there are small lumps which are look like surga lumps, then local people named this variety as Nhan Duong Phen (sugar candy longan). However since the fruit is smaller then the productivity is lower than those of Huong Chi, the Duong Phen longan mainly is producing for home consumption.

#### **Production structure by longan varieties:**

- ❖ Delicious longans (Duong phen, Huong Chi) reach 5500-6500 ton which occupies about 25-30% from total production. These kinds only are sold by contract to serve the consumption in restaurants, hotels, offices, authority offices... or directly to local consumers. The average price for these kinds is rather high VND 16000-20000/kg.



- ❖ For good quality longans: These longans reach about 6500 ton (30% production).

Main markets are in Hung yen and the neighbour cities such as Hai Duong, Ha Tay, Thai Binh, Nam Dinh, Ha Noi, Hai Phong ...The longan selling is mainly responsibility by traders. Beside one part of product selling directly manages by the producers. The average price is VND 9000-12000/kg.

- ❖ For the lower quality longan (mainly including flesh longan, water longan, "Paddy" longan which are distributed evenly in the province). The estimated production is above 9,000 ton that occupies over 40% from total production. These longans are used to process dried longan flesh. The average price is VND 4000-6000/kg.

### **III. Information on market and the product development**

#### **1. Tendency of the product market**

Longan, litchi and rambutan are classified in the same fruit category. Longan is considered to be the high value fruit trees and at the same time, longan is one precious fruit tree among our country since it provides high value of nutrition (in the longan flesh, there is 15 - 20% of sugar, 0,09 - 0,1% acid, 43 - 163 mg/100 g of vitamin C, and contains vitamin

B1, B2 and mineral agents such as Ca, P, Fe,...); longan is suitable for both fresh and process consumption, then there are both export and domestic markets for longan. Nowadays, the consumers prefer the delicious longans for fresh consumption. A part of the longan production is imported to Europe (Germany) by the small volume way and the consumers there are very preferred<sup>2</sup>.

## 2. The Longan development through different periods

The development of Hung Yen longan can be divided into 2 periods as following:

- Before the years 70s period: In this period, longan was planted individually, the producer planted the variety which was available to them. The longan was planted mainly by nursing from longan seed or some by provine method. Longan was growth in the common area: transport roads, canals, ditches...
- After the years 70s period: when the provine method<sup>3</sup> become popularly, the longan development started getting increase. The longan development was the strongest in the years 90s when the knot graft method started to apply then the cropping pattern transform movement strongly developing.

Since year 2000, the local movement allowed to transform from rice land to longan land, which created an impetus to expand longan area on the transformed land (including river banks land and former rice land). In the special land for longan in Hung Yen town, up to 90% transformed agriculture land has planted longan, therefore the longan area is getting increase (5500 ha in year 2004 increased by 1500 ha to year 1997). At present, the longan area is still getting expanding. The high quality and productivity longan varieties through annual evaluation are paid attention to develop in order to replace the old trees and to improve the mixed longan gardens. According to the plan to year 2010, the fruit tree area of the province will be about 10,000 ha of which the traditional speciality trees occupy 6500 ha (Both concentrative and semi-concentrative areas). The longan area is expending by the ways that conversing from low land with low productivity rice land to grow longan; improving mixed gardens; and newly developing on the Red Rive banks. The province is trying to expand the concentrate longan area up to 3900 ha increasing by 1500 ha to present area. The longan area will be developed to the districts near by the Red River such as Khoai Chau, Tien Lu, and Kim Dong...

## 3. Local production element affected to longan development

Climate - soil: Longan tree does not requires good and special soil (it can grow on many different soil types: alluvium land, clay land, sandy land, hill or mountainous land...) with the pH suitable for longan development is 5.0 – 6.5. The longan is very suitable to grow on the rich organic alluvium, high humidity, not under water land. In Hung Yen town, Tien Lu, and Khoai Chau district, the major soil is light alluvium soil with high nutrition content, which very suitable for longan tree to grow and develop. In reality, the longan zoning is very clearly because the longan quality is quite different between different zones. Most opinions of the buyers and the Hung Yen people are that the longan in Hung Yen town is the most delicious and the longan area here is the largest. (Beside, in some communes in Khoai

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<sup>2</sup> Source: DARD Hung Yen

<sup>3</sup> This method, the grafted longan tree is not only keeping the good qualities of the tree but also growing fast and strongly since the radical tree was planted from seed. Beside the grafted tree is much smaller than the provined tree then easy to transport to long distant.

Chau district, there also delicious longan varieties but the area is not large). However no detail research to find the affect of the natural and socio factors in the longan grow area to the quality of longan.

**Table 2: Economic coefficient comparison between Huong Chi longan and Rice**

Items	Huong Chi Longan	Rice	Differences	
			Value(+,-)	Rate %
1. Total cost	946492	180000	766492	426
- Physical cost	281492	150000	131492	88
- Service cost	665000	30000	635000	2117
2. Home labor cost				
3. Productivity (kg/sao(360m <sup>2</sup> ))	360	180		
4. Average price (VND)/kg	8600	3000		
5. Total production (VND/sao)	3096000	540000	2556000	473
6. Benefit	2149508	360000	1789508	497

(Source: Survey data VASI 2005)

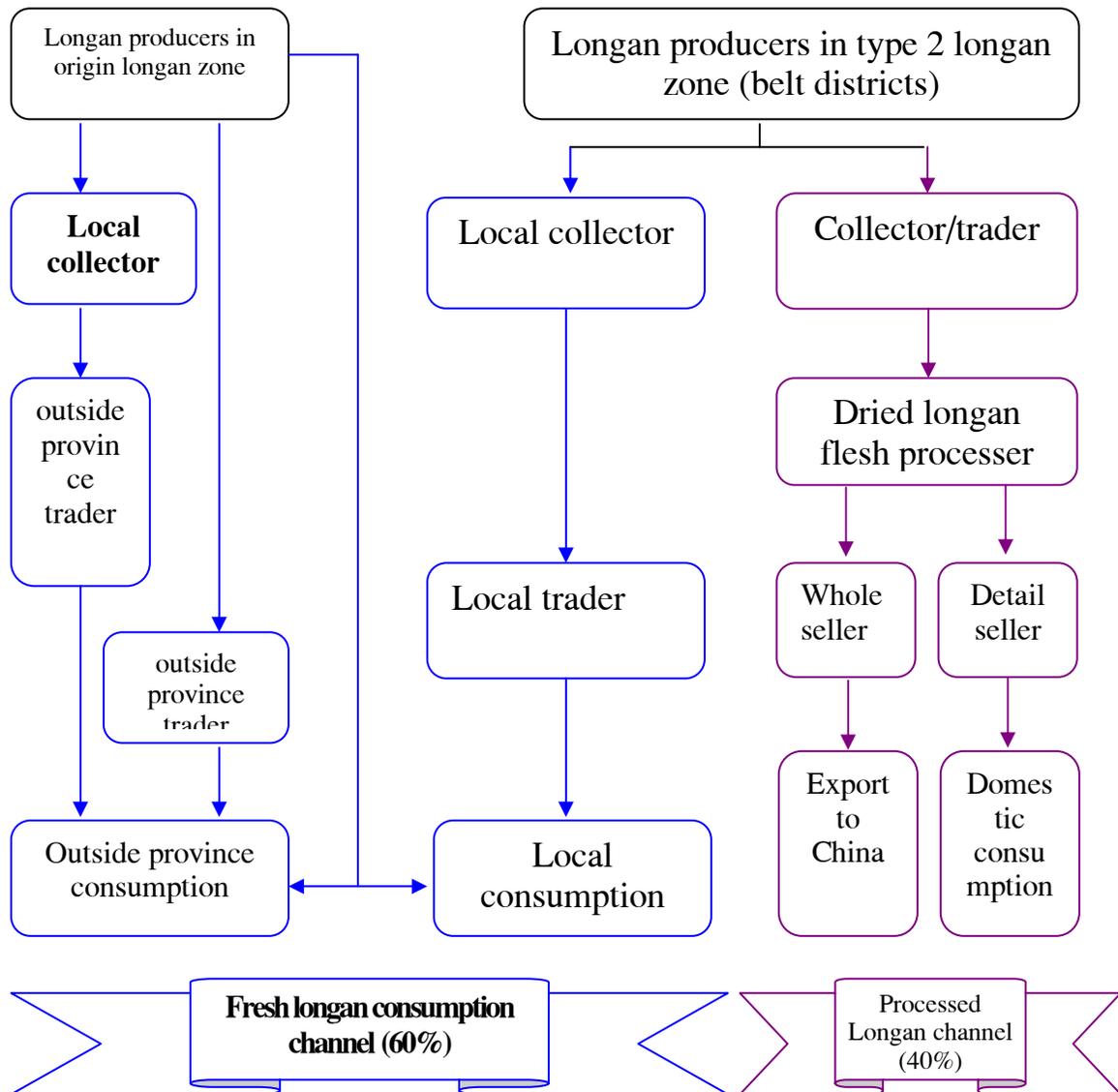
In Hung Yen town, beside the significance of long traditional (evidence is that the progenitor longan which is 300 year old, still alive and produce fruit); the advantage of the economic efficiency of the longan to other trees is the other element to develop the longan trees.

Therefore the longan tree brings higher economic efficiency to rice. This is the important element to push the cropping pattern transform from rice to longan.

## IV. Value chain for longan in Hung Yen

### 1. Commodity channel

Longan is a fruit for both fresh consumption and processing to dried longan flesh for domestic and export. The commodity channel for longan in the province can be drawn as following diagram: (Diagram 1)

**Diagram 1: Commodity channel for longan in Hung Yen**

Commodity channel 1: This is the fresh longan consumption channel. There are 2 branch-channels for fresh longan consumption:

- (1) Direct channel from producers to consumers occupies 30% of annual longan production and the longan for this branch-channel is mostly delicious; belong to the first kind of quality (the big longan and Huang Chi longan...). The transaction is in the longan producers' houses. The buyers are the local people or the traders from the big cities (Ha Noi, Hai Phong, Quang Ninh...). They buy longan through contracts between the producers and the restaurants, hotels, government offices.... They are familiar to the producers, heard about the well known of the longan. Although this kind of longan is sold at farm gate but the price is high and rather sustainable from VND 16,000-20,000/kg.

- (2) Selling longan through traders and collectors occupies about 30% of the annual production. The longan product in this branch-channel is mostly the second rank of quality with rather delicious. The buyers in this branch-channel are the visiting guests, local people and neighbour provinces people (Longan is sold in the National Road 5). The average price about VND 10,000-12,000/kg.

**Commodity channel 2: Processed longan.** This channel consume up to 40% from the totally annual production of longan. The major products are flesh longan, rice longan, water longan or unqualified longan (from delicious longan) to be material for process dried longan flesh. The product is purchased by traders and collectors with huge amount.

## 2. Longan product market

For fresh longan, the selling period is from 35th to 50th day of the longan harvesting. Through the consumption channels, the minor longan quantity is consume in the local, the major part of longan is consumed in the big provinces and cities in the same region such as: Ha Noi, Hai Phong, Quang Ninh....The rest of 40% of longan production is processed to be dried longan flesh then to export mainly to China.

# V. The main actors participating in the longan value chain and their relationship.

## 1. Producers (Seedling producer and fruit producers)

Hung Yen province has large area under longan but not the same for all districts in the province. As above mentioned, the longan concentrating in the Hung Yen town, some communes of Tien Lu, Kim Dong and Khoai Chau district...These locations have not only large area covering by longan but longan quality here is delicious. In these areas, longan is the main crop in the cropping pattern for the farmers. The longan seedling is produced mainly in these areas. At the present, the seedling producers in Hung Yen have capacity to supply the longan seedling not only enough for the province demand but also to supply for about hundreds thousand seedling to farmers in neighbour provinces.



In the province, most of the long time longan farmers have capacity to be self sufficiency of seedling by multiplying themselves from their delicious longan trees or buying from their local neighbours. During the farming longan, beside the general procedure on looking after – harvesting, the longan farmers still have their own secret technique based on their gardening experience. Due to this factor, the longan quality in general is not evenly caused by farmers do not plant the same standard seedling and do not apply the optimal production procedure (nobody controls).

Harvesting, handling and selling: Most of these works are demanded and responsible by the traders and collectors (hire for harvesting: may be rent labors are the farmers or outside labor or may be themselves). There are 2 types for final consumption product: the delicious longan for fresh consumption and the others (unqualified, mixed longan...) for process. Longan is no brand name when it leaving from farm gate.

Selling procedure: The longan farmers directly sell longan to the traders or collectors in the local at their garden. This procedure is main selling way at the moment (it occupies 85% of total different ways). Normally the farmers and traders and collectors are familiar each other then very simple in their transaction, even the collector get the longan first and pay to farmers latter. Usually, the large scale with delicious longan farmers have stable clients and obtain a high price annually due to direct selling to final consumers or big traders. Selling at garden helps the producers to be more active in price negotiation, to avoid setting price by force, to reduce middle cost... Besides, the other way is the longan farmers bring longan out to sell.

Difficulties and support requests: On the seedling production: In order to standard the Hung Yen longan for planting or consuming, the longan trees should be evaluated annually to select the best longans of the year. The farmers satisfy the seedling quality standard would be issued a certificate. The seedling nursing farms should be responsible on the seedling quality produced by their farms. If the seedling quality is under the standard, the farm's certificate will be withdrawn.

The longan zoning is one of the important request for the process to bring the big longan became a brand name and geographic origin product. Therefore the province should organise longan zoning, standardise production procedure, seedling, provide training to farmers on the benefit of the brand origin name for the big longan and the regulation (request) to be followed. It should be assist the actors to found a club, association to increase the product competition.

## 2. Collectors/traders

The collectors and traders are the local people, acting in seasonal. These actors buy longan at the farmers' gardens in the town and around areas. Then these longans are sold in Dau market or directly to processors in Phuong Chieu, Hong Nam... Besides the town, these actors also collect longan in the near by areas in Khoai Chau, Kim Dong, An Thi ...

The buying-selling form between these actors and farmers is "mua vo" that means they buy the whole tree, each tree is estimated the longan quantity and quality then the price is determined. The efficiency of these actors' activities depends on their experience on production volume and quality of longan. Each collectors/ traders have regularly relationship with about 5-10 longan producers who are the stable longan suppliers to the actors.

**Table 3: Characters and operation scale for the collectors**

Ord	Items	Unit	Selling at market			Selling to processors		
			Volume	Min	Max	Volume	Min	Max
1	Sold volume /day	kg	200	150	300	250	200	<b>300</b>
2	Home labor	%	1	1	2	1	1	2
3	Rent labors	Person	1	1	2	1	1	2
4	Longan capital / day	Million	3	2	5	3	2	4

5	Time for trading	Hour	5 AM - 6 PM			5 AM - 6 PM		
6	Input actors	Person	8	5	11			
7	Output actors	Person	9	7	12	6	4	7

Source: Survey data VASI, 2005

The collectors compete each others through buying price and clearance form. For the delicious longan as Huong Chi and Duong Phen longan, the collectors/traders buy at longan gardens then packaging and sell at the market in Ha Noi, Hai Phong and other provinces.

In Ha Noi, the longan is gathered mainly at Long Bien market. When harvesting season start, there are more than 10 big traders of Hung Yen town practise trading in Long Bien Market with the transaction of 10-15 ton of longan per day. In Hai Phong, longan is gathered at Do market. There are 5 - 7 traders from Hung Yen town practise trading there with the longan volume transaction of 5-10 ton per day. The traders contract to transport commercial households to hire a truck, individually or some traders share one depending on the volume of longan, outside province traders' demand or market demand.



**Table 4: Characters and operation scale for the local traders**

Ord	Items	Unit	Selling in Ha Noi, Hai Phong			Selling in the province		
			Volume	Min	Max	Volume	Min	Max
1	Sold volume /day	kg	900	500	800	400	200	500
2	Home labor	%	2	1	3	2	1	3
3	Hired labors	Person	2.5	2	3	2	1.5	2.5
4	Longan capital / day	Million	8	5	10	5	3	7
5	Time for trading	Hour	1 AM - 8 AM			5 AM - 6 PM		
6	Input actors	Person	5	5	10			
7	Output actors	Person	5	4	7	6	5	10
8	Purchased volume/actors	Kg	100	100	200			

Source: Survey data VASI, 2005

The collectors/traders system pay important role in the whole value chain, they keep the role to coordinate the supply source for markets. These actors purchase longan from local collectors or directly purchase from farmers who are famous in region. The volume purchase is huge with diverse and high quality. The relationship between traders and producers is stable, long term for their benefit.

The Ha Noi traders have two ways information, from producers and from retail sellers system. They updated the information on prices, product qualities and supply amount from the different production areas in Son La, Ha Nam, Thai Binh... at the same time the information on demand from retail sellers, in order to coordinate the production according to the suitable price.

The present difficulties of the traders is finding a sustainable markets to allow in general, the traders be more initiative in selling product. For bigger traders, introducing the products to supermarkets is difficult due to the even degree of the product is still low, unqualified; or few quantity qualified and the most difficult is that they can not provide the clear evidences to classify the longan fruits.

### 3. Retail sellers

These actors practise commerce at the town markets such as Dau, Pho Hien, Ba Hang, Xuoi, Dau... and in some belt roads inside and outside of the town. There are 2 types of sellers: fixed store and peddling.



- *The Peddles*: They are from the town contiguous districts. They are not regularly peddles, only during the longan harvesting period, they buy longan from the collectors or direct from farmers. Peddles buy longan from the farmers with low production, low quality and low price longan, and then quality of longan in this channel is low. The clients of this channel are the transport guests, who buy longan as a gifts for others, or the moderately income people. In this channel, the peddles sell confused qualities longan or false weight of longan.

- *Fixed store retail sellers*: In these stores, there is not only longan but together with many different fruits. The average areas of store is about 2- 3 m<sup>2</sup>. Quality of longan in these stores is rather good since these sellers have long time experience in quality evaluation for fruits. In other hand these actors buy longan directly from well known farmers or from the big traders in the town. The clients of these stores are the regularly, companies, offices inside and outside province. They order to buy longan for gifts in special occasion.

The retail sellers usually sell the low quality product. They buy longan from the collectors or directly from farmers. Besides, they sell their own produced longan... It is difficulties for clients to recognize the quality of longan since it is not possible to determine the longan origin and quality (mixed also delicious longan).



### 4. Processors

This actors group have founded since long time with the processing procedure follows the traditional method.

There is dried longan flesh everywhere in the province but it is more concentrated in Hong Nam commune of Hung Yen town. The Processors purchase directly from the local and non-local collectors in the Dau market or these collectors bring longan to the process stoves to sell. They have regular supply system, however when longan production is scarce in market, they have to go to buy longan directly. Beside the provincial longan, they also buy longan from other province for processing.

**Table 5: Some characters for the processors**

Ord	Items	Unit	Volume		
			Average	Min	Max
1	Purchase volume /day	kg	500	500	1000
2	Home labor	%	2	1	3
3	Hired labors	Person	5	5	10
4	Longan capital / day	Million	4.5	5.5	7
5	Time for trading	Hour	5 AM – 7 PM		
6	Total capital	Million	50	30	100
7	Input actors	Person	5	7	10
8	Output actors	Person	4	4	7
9	Purchased volume/actors	Kg	100	200	300

Source: Survey data VASI, 2005

Capital scale is rather high for longan flesh processing because the daily capital request is rather high and the dried flesh product can not be sold as soon as produced. One season for dried flesh last from 1.5 – 2 months, then the capital is keep for long time and the capital revolving rate is low. The processors have to borrow money from the banks with the rather high interest rate of 1% - 1.5% per month. In order to increase the revolving rate, the processors usually find the place to sell their product as soon as the first batch produced. The market for the dried longan flesh as following:

- 80 % for China market
- 15% for markets in Ha Noi, Hai Phong, Ho Chi Minh City
- 5% for other markets.

The dried longan flesh value chain is classified into 2 main channels:

**Channel 1: Farmers => Collectors => Processors => outside traders => Retail sellers => final consumers**

**Channel 2: Farmers => Collectors => Processors => China traders**

China is the main market for dried longan flesh for Hung Yen. However, last two years this market is getting smaller due to many reasons. The main reason is the high import tax then the price is difficult to compete. Due to the difficulty for dried longan flesh marketing, the process scale is getting smaller and they transfer to domestic markets.

Although the dried longan flesh is very developed in Hung Yen, but most of them use coal stoves to dried longan then the dried longan flesh is not ensured hygiene. Beside that, the China market is not stable then the selling volume depends much on this market. Therefore, in order to increase production value for dried longan flesh, research to transfer technology to process longan to ensure hygiene should be important. Further more the specific responsible offices should closely control the quality. Beside it should be initiative to find the new market for dried longan flesh to avoid depending too much on China market.

## 5. Some characters of longan market in Ha Noi

Through actors' survey in come longan consumption centres in Ha Noi, we have determined that the largest centre for longan consumption in Ha Noi is Long Bien whole sale market. Long Bien covers large area, located outside of river dike, founded about 30 year ago, the busy trading performing since last 15 years. The market operates year round with completeness of fruits from all provinces domestic to import. The busiest time is from 1 AM to 5 AM. During this period, the transaction performs not only in side market but also expanding to outside of the market. The fruit retail sellers of the city and the whole sale traders from other province usually buy fruits in this market and then to deliver them to the local consumers. The fruit volume to be solve in this market is estimated about 200 – 300 ton.

**Table 6: Longan source structure and actors operating in Long Bien market**

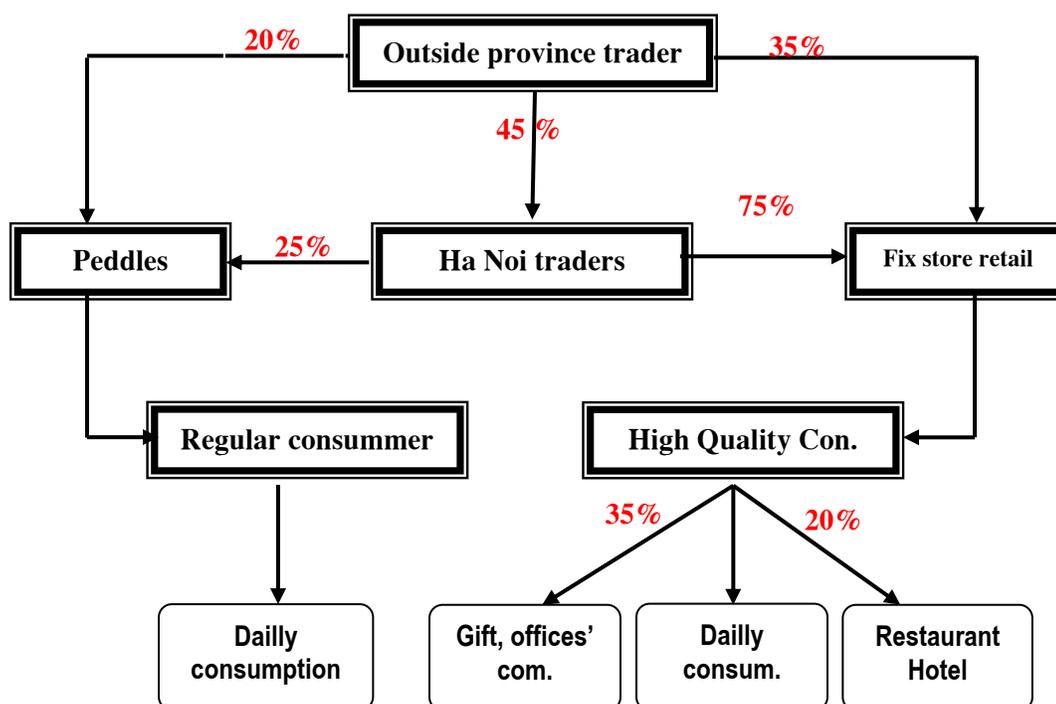
Actors origin	Number of actors	Rate
<u>Outside province</u>		
- Hung Yen	7- 10 actors	20%
- Ha Nam	5- 7 actors	15%
- Son La	10- 15 actors	30%
- Yen Bai	5- 7 actors	13%
- Ha tay	3- 5 actors	7%
- Hai duong	4 actors	5%
<u>Inside city</u>		
- Ha Noi	4- 6 actors	10%
Total	40- 50 actors	100

Source: Survey data VASI, 2005

In the longan harvest season, the longan producing from many provinces are gathered here, beside longan from Hung Yen, there are longan from other provinces such as Ha nam, Hai Duong, Son La, Yen Bai... Longan from Hung Yen occupied a part from the total longan consumed here. The longan systems supply to Ha Noi through the following channels (see diagram). The most important channel to supply longan to Ha Noi is that **Local whole sale traders => Ha Noi whole sale traders => Retail sellers**. This is the high quality longan from Hung Yen to final consumers.

### Characters, scales of the longan traders in Long Bien market

Most of the traders practising in Long Bien market have long time experience in fruit trading. Beside longan, these traders also practice commercial for other fruits when their season comes such as litchi, orange, plum, water melon... In the market the outside province traders have to pay the market fee to the market management board according to their goods volume. The fee is about VND 30,000 - 50,000 per basket according to small or large basket, the average weight of the basket is from kg - 140 kg.

**Diagram for longan supply to the city****Table 7: Some characters of the traders in Long Bien market**

Ord	Items	Unit	Volume		
			Average	Min	Max
1	Purchase volume /day	kg	2500	1500	5000
2	Home labor	%	1	1	2
3	Hired labors	Person	2	2	3
4	Longan capital / day	Million	20	15	35
5	Time for trading	Hour	1 AM – 5 AM		
6	Input actors	Person	3	2	5
7	Output actors	Person	7	5	10
8	Purchased volume/actors	Kg	300	200	500
9	Number of product types	Type	3	2	5

Source: Survey data VASI, 2005

Location of the traders in the market is very important for their trading. Some big traders buy some places in the market due to good relationship between them and the market management board, after that they re-hire the market places to outside province traders to sell goods. These big traders have market place for hire and at the same time they are big whole sale traders. When the outside province traders have good quality longan batches, these Ha Noi big traders are the first come and ask to buy whole batch and then to sell to retail sellers in the city. The value differences that belong to these Ha Noi traders are about VND 500 - 1000. The volume under this transaction occupied about 30% - 35% because only the newly outside province traders participate to this style. For the long time traders from outside provinces, since they are familiar to the market people and already

hired a regular places then they have regular clients and in order to keep their prestige then they can make agreement to other retail sellers and their benefit is still high.

### Characters and scale of fix fruit stores

There are plenty actors who have fix store to sell fruits scattering in the city but still more concentrated in the central markets, the crowded areas of the city. These actors have main income from fruit commercial. Usually they use a part of their house to be store. Some of them have their stores along pavement; some others hire a place in markets. These actors go to buy goods every morning in Long Bien market after that to sell the goods to consumers.

**Table 8: Volume and product structure, activities scale of retail actors**

Ord	Items	Unit	Volume		
			Average	Min	Max
1	Purchase volume /day	kg	50	30	90
2	Home labor	%	1.5	1	2
3	Hired labors	Person	0.5	1	1
4	Longan capital / day	Million	5	3	8
5	Time for trading	Hour	7 AM – 9 PM		
6	Input actors	Person	2	1	3
7	Output actors	Person	5	5	10
8	Purchased volume/actors	Kg	30	20	50

(Source: Survey data VASI 2005)

The products for this channel have good quality and no-problem with the price. After the actors test the fruits, the agreement for price is made and the transaction is of suitable between price and quality.

### Some characters of peddles.

These actors origin from contiguous provinces of Ha Noi such as Ha Nam, Hung Yen, Hai Duong, Ha Tay, Bac Ninh,... They are professional peddles year round. Usually they do trading according to the different fruits seasons. Besides longan, they trade litchi, orange, plum, water melon, mango, and rambutan. The equipments for these actors are baskets and "quang ganh" (rattan and bamboo frame (to hold loads at the end of the carrying pole)) to carry the fruits along the streets to sell. Some few actors use bicycles to carry the fruit around. These peddles buy longan from outside province traders, some buy from traders inside market. They only trade the second or third ranks quality longan depending on the quality and price. This kind of longan most comes from other provinces but very small rate from Hung Yen. This longan usually is unqualified after the market traders sold the good longan to the fix stores or the longan which could not sold from the day before. Then the quality of longan in this channel is not good and the price is lower.

**Table 9: Activities scale of retail sellers**

Item	Unit	Quantity	Min	Max
Labor	Person	1	1	1
Number of product types	Type	1-2	1	2

Sold volumes/day	Kg	25	20	30
Input actors	Person	2	2	3
Output actors	Person	15	10	20

Source: Survey data VASI, 2005

One of the characters of these actors is flexible in trading in order to create high benefit. For example that, they will not ensure the right weight of longan for the clients when they sell longan with price lower than that when they buy. They can sell longan with very different prices depending on the clients. The clients of this channel are easy and they request moderate quality production to be suitable with their income.

## 6. Final consumers

In market, the big longan<sup>4</sup> Hung yen is well known and become a certain position in the purchase habits of the consumers. However it is very difficult for consumers to buy right big longan, even the local people also meet difficulty to distinguish which is the right one. (Mrs. Lan, a big fruit trader in Hung Yen town said for the professional fruit traders as her, it takes about 3-4 years to distinguish the different between the longan varieties existing in the market). As above mentioned, most of the fresh longan consumed in Ha Noi or in other provinces by the clients who have high income or the high class clients (purchase by order to restaurant, hotels...)

## 7. The activities to develop longan tree in the province

Conservation and development of the precious longan variety gene: In 1999 with support from MARD, Ministry of science and technology (MOST) and Research Institute for Fruit and Vegetable (RIFAV), the province organised the longan tree competition. Through this competition, there are 39 longan trees selected to be representative for 3 early, right and late seasons. These trees were suggested to MARD to issue a certificate to be the national variety. Most of the selected longan trees belong to concentrative longan areas (Hung Yen town and Tien Lu district). Now, these 39 trees are planting in the gene conservation garden in Hung Yen Department of Sciences and Technology (DOST). The province organise this competition annually in order to standardise longan varieties and step by step to expand these varieties into production.

Since year 2000, the province advocated to allow conversion from low efficiency rice areas to grow longan. Besides, the policies on cropping pattern conversion for the longan origin communes created an impetus for strong development of longan area in the province as it seen now.

Year 2002, the agriculture biology diversification conservation project implemented in order to conserve and maintain the longan variety diversity and to push the high quality longan production.

In addition, the Departments and sectors in the province (DARD, DOST, Gardening association, Farmers association...) provide training annually on technique procedure of longan planting, extension... to farmers.

The longan production in Hung Yen at the moment stops at the individual household level only, not yet had an organisation with initiative and practical activities to help farmers on techniques, update information, and selling products.

<sup>4</sup> (Folk) name for generally delicious longan varieties in Hung Yen

Besides the individual activities, in year 2004, the big longan planting farmers association in Hung Yen was founded with the role of assistant to farmers to develop, conserve longan production and selling longan products in order to establish brand name for Hung yen big longan. The association was founded according to Decision Number 3110/QĐ-UB dated 08 December 2004 of Hung Yen Provincial peoples' committee.

The association has 57 members, most of them are farmers who participate in the project on intensive longan planting and overcoming the every other year harvest situation. This project managed by DOST in collaboration with the RIFAV and has been implementing since 1997. The farmers who participate in the longan competition in 1999 and were ranked from pass to excellence level; who participate in the project of biology diversity and who have experience in longan planting and have delicious longan tree, are introduced to be member of the association. These farmers are in Hung Yen town and Tien Lu district.

The association operates according to the Decree 88/2003/NĐ-CP dated 30/7/2003 of the Government. However, the leaders of the association are responsible of the officers of DOST and DARD. With this issue, the association activities including:

- Editing the documents on longan planting procedure, publishing these documents and delivering to members.
- To organise meeting, exchange experience discussion on longan planting, with participation of RIFAV's specialists.
- To complete the files for application for brand name for Hung Yen big longan to MOST and Department of intellectual property.
- Association leadership organises visiting demonstration farms of Thanh Ha thieu litchi production association.
- The association worked with Big C supper market to supply longan to and supply by the big trader in Hong Chau commune, who practice trading in Long Bien market. However since the Big C's demand is too low (70 – 100 kg/day) then the transaction could not be made.
- To organise the longan fair to introduce, sell the Hung Yen speciality longan, to combine a competition for the delicious longan in order to encourage sprite of the producers, to conserve and diversify longan varieties.

Since the association has no concrete activities to bring higher benefit for the farmers then at the moment all expenditures for the association are borne from DOST. However, in order to Hung Yen big longan association to operate more efficiently, the association should be really a property of farmers; farmers should be themselves to discuss and organise activities for their own benefit.

## **VI. Price forming process in the longan value chain**

### **1. Price formation process in the fresh longan value chain**

The evaluation of price formation process is very difficult because of the diversify of longan products and the fluctuation of market prices. In addition the flexibility in selling

product of the actors is other difficulty to describe the price formation. With above difficulties, the price formation process based on following elements:

- Price is for the survey moment and for specific commodity channel and the channel is popular with good quality longan from Hung Yen to Ha Noi.
- The operation cost is at the survey moment and is the main cost for the all different actors.
- The product selected is only one and representative in the activities of all actors.

In this channel the price of the product and benefit of the different actors are changing as following: (Table)

Through price formation of the commodity channel, we can see the benefit of the actors depending on their operation scale and we also see the risky in their operation process. For the collectors, who are the bridges to collect products from producers to traders, the capital involving time is short, less risky and their benefit is smaller than those of other actors. At the same time, the traders with responsibility for longan demand and supply coordination, the time to keep the products is longer, their benefit is higher. The highest benefit is for the retail sellers, since their operation scale is smaller, the risk in the operation is higher since it depends totally to the consumers, and then the benefit per kg of product transaction is very high.

**Table 10: Price formation in the commodity channels**

FRESH LONGAN				LONGAN FOR PROCESS			
Ord	item			Ord	Item		
<b>1</b>	<b>Producers</b>			<b>1</b>	<b>Producers</b>		
1.1	Physical, service cost			1.1	Physical, service cost		
1.2	Hired labor cost			1.2	Hired labor cost		
1.3	Selling Price	8,500		1.3	Selling Price	55,000	
1.4	Benefit	4,896		1.4	Benefit		
<b>2</b>	<b>Collectors</b>			<b>2</b>	<b>Collectors</b>		
2.1	Purchase price	8,500		2.1	Purchase price	55,000	
2.2	Transport + buying cost	320		2.2	Transport + buying cost	3,000	
2.3	Labor cost	180		2.3	Labor cost	1,500	
2.4	Selling price	9,500		2.4	Selling price	67,000	
2.5	Benefit	500		2.5	Benefit	7,500	
<b>3</b>	<b>District traders</b>			<b>3</b>	<b>Processors</b>		
3.1	Purchase price	9,500		3.1	Purchase price	67,000	
3.2	Process + labor cost	230		3.2	Process + labor cost	6,850	
3.3	Transport + unloading cost	670		3.3	Transport + unloading cost	3,200	
3.4	Other cost	100		3.4	Other cost	1,000	
3.5	Selling price	11,500		3.5	Selling price	90,000	
3.6	Benefit	1,000		3.6	Benefit	11,950	
<b>4</b>	<b>Outside province traders</b>			<b>4</b>	<b>Outside province traders</b>		
4.1	Purchase price	11,500		4.1	Purchase price	90,000	
4.2	Hired labor cost	320		4.2	Process + labor cost	3,660	

4.3	Transport + unloading cost	876	4.3	Transport + unloading cost	340
4.4	Other cost	150	4.4	Package cost	1,890
4.5	Selling price	14,200	4.5	Selling price	105,000
4.6	Benefit	1,354	4.6	Benefit	9,110
<b>5</b>	<b>Retail sellers</b>		<b>4</b>	<b>Retail sellers</b>	
5.1	Purchase price	14,200	5.1	Purchase price	105,000
5.2	Transport cost	270	5.2	Transport cost	2,780
5.3	Package cost	80	5.3	Package cost	
5.4	Other cost	150	5.4	Other cost	2,380
5.5	Selling price	17,500	5.5	Selling price	145,160
5.6	Benefit	2,800	5.6	Benefit	35,000

Source: Survey data VASI 2005

## 2. Price formation in processed longan commodity channel

The dried longan flesh process at the present bring rather high economic efficiency to the actors participated in this channel. However the marketing products are still very risks to the processors especially for high investment processors.

For the actors in this channels such as collectors, processors and retail sellers, the dried longan flesh bring higher benefit to them than for the fresh longan business. On 1 kg product transaction, the collector obtains VND 500 and VND 750 of benefit for fresh longan and for dried longan flesh respectively. That is why the collectors consider the transaction on dried longan flesh as their main activity.

The Price formation table shows for the dried longan flesh channel, the benefit of producers is less supportive because they only can sell longan with low price. That is why for the production development of the zone, it always takes into account the traditional character. The other zone as Kim Dong and other districts, the farmers have tendency to select the high quality longan varieties to grow. (Table)

## VII. Advantages and difficulties

### 1. Advantages and difficulties in production

*Advantages:* In Hung Yen, Longan is the tree with many advantages such as the well known longan, in addition the soil and climate environment are suitable to grow and expand longan to large scale. Besides, the local farmers have long time farming habit and experience. With these advantages, the longan is selected to be the most important fruit tree in fruit tree development plan of the province.

*Difficulties:* the longan varieties management is not yet followed a technique standard, then the seedling produce is not yet controlled, many places use the name of big longan to gain benefit for the wrong seedling then make harm to the longan planting farmers. Last few years, since longan brings high economic efficiency then many farmers individually transfer to plant longan tree, to build up the longan gardens but do not follow the general plan, which creates a difficulty for land use and management for the local. Besides, the risk in production still is high because the longan productivity much depends on climate.

## 2. Advantages and difficulties in selling products

*Advantages:* The Hung Yen big longan in particular and longan in general already have steady places in the memory and demand of the consumers. This comment is proved that most of the delicious longans are sold at gardens, no need to bring out. For process, there is a process system located in groups, which is condition to expand scale and development and to apply technology sciences.

The local authorities pay attention in the finding and organizing for longan product market through the fairs or the big longan association activities. In addition, the actors in the longan value chain are rather professional; their activities are rather diverse and can response to the changes in production and markets.

*Difficulties:* Although the output products both for fresh and process markets have much potential but the markets are not very stable, even for domestic markets. The export processed longan to China still be uncertain and not initiatives. At the present, there is not the separately channels with different qualities, then the consumers meet difficult to find the product with its quality as they desire.

In addition, preserving the fresh longan fruit is very difficult. The concentrative harvesting seasons make longer time for preservation, then spoilt and cover broken longan rates is high, that takes to lower selling price and loss the competition advantage. Therefore the longan commodity channels are usually short and simple. There is not a procedure to preserve fresh longan for longer time for longer transport in order to reduce the pressure on the longan crop season time. Some households take unfair advantages of big longan well known for unfair trading through mixing big longan to regular longans, which makes the client' trust reduced.

## 3. Advantages and difficulties in process and consumption

The longan process method in many places is of handicraft, then it spent more energy for process and then cost for 1 kg processed product is high and the processed product quality is low competitive and the consumers accept the product difficulty.

# VIII. Conclusion and recommendation

## 1. Conclusion

Hung Yen longan has been being the tree which brings the high income for the longan farm households in the province. Besides of cultural and traditional, the longan is also a tree having a high economic value, a potential for export especially the dried longan flesh. Nowadays the longan tree area is getting expanding strongly, especially for the high productivity and continuous giving fruits for many year longan varieties such as Huong Chi. In some concentrative longan zones, the movement of cropping pattern conversion from low productivity rice to longan planting takes place strongly. This phenomenon is suitable to the province agriculture development orientation where longan tree is determined as the main fruit trees. According to the perennial trees development orientation of the province up to 2010, the longan tree is the main tree and the area under longan will be double to present area. This orientation is suitable.

The longan trading system for the province at the present has some specific characteristics as following:

- The commodity channels are short and mainly to connect between the productions areas to consumption market near by. The channels have not yet expanded to the central and the south of the country.

- There is not yet the separately channels for Hung Yen Longan products but still mixed between Hung Yen longan and other province longans. This make the consumers are difficult to find the real delicious longans.

- The dried stove system is already supported to process dried longan flesh. However the market for this processed product is unstable and depended much on China market then when the China market has fluctuant, the longan process in Hung Yen will face to very risky.

- The market operates based on the individual trader's development, not yet received any support from the Government to expand market and to find the stable markets.

The development of the production and trading operation system for longan product shows the economic efficiency of the actors participated. However from the producers to different trade actors, there is not a specific and long term strategy in order to improve the responses to the market changing. However the developing and expanding production still is the present tendency for the farmers as well as for local government.

## 2. Policy recommendations

The development of the Hung Yen longan value chain needs an intensive supports for production and consumption to be sustainable:

### ❖ *On production*

- Hung Yen province and the districts should produce a specific plan and implement the plan for longan production to be suitable to natural resources and advantages of each zone to separate the traditional longan production with high quality zones from the longan for processing zones.

- To research and conserve gene source of longan with high quality in large area. Then to orient for the producers to exploit optimal advantages of the local longan varieties with high quality and to increase the efficiency of the production.

- To replace step by step the low quality longan by the high economic value such as Huong Chi, Flesh longan, Duong Phen...To establish a standard procedure for production and to implement collective process to build up a value chains with the even quality and to build the brand name for Hung Yen longan.

- Improving the longan garden and expanding to new garden should have research and support on extension and technique in order to optimally and efficiently use production powers such as integrated between livestock and longan trees, releasing livestock.

- To apply intensive measures for longan planting, using methods to last the harvesting period to be longer in order to ensure to supply longan product longer time for market.

- The present production organisation of the Hung Yen big longan association has not yet been efficiency and not yet given its influence to large scale. Then it is necessary to have more organisation forms and to reform the present association to let the association becomes the really farmer and processors' association. Since then the organisation could have capacity to determine price for the product and to expand the impact of Hung Yen longan in Vietnam market.

### ❖ *On marketing organisation*

- Research and expanding domestic markets are necessary activities, especially for long distance market channels. The seasonal nature of the product is one of the limitations for longan, then expanding markets is one activity to optimally limit the unbalance of demand-supply in the market and to reduce risky in production and consumption.

- Besides of longan area development, it needs to pay attention on farm demonstration establishment, to build longan process factories, and to apply cool preservation technologies in order to increase value of longan.

- To organise the dissemination, marketing to increase prestige and to expand the province big longan brand name, to establish a production and process cooperatives, associations to prepare to build the brand name for big longan brand name. First of all, it should to establish the relationships between Hung Yen big longan association and the commercial centres and supper markets in order to push the development and influent level of the association.

- To establish a separately commodity channel for high quality big longan through the establishing the relationship to big traders, collectors and consumption traders. To establish criteria systems on product quality in transaction among big traders and between the producers and output product actors.

- In this research frame the above recommendation applied for the establishing the relationship between the big longan association and the traders (as above mentioned) to Commercial organisation Metro in order to found a separable and stable channel.

- In order to good implementation of the above recommendations, the following 4 sides should collaborate together: Government with production zone plan; Scientist with creation and selection of variety and application of technique science breakthroughs in intensive longan planting to support to production; Traders with process, selling concern; and farmers with the high quality product, high productivity, sustainable and efficient production.

## IX. Annex

Socio-economic and demography of Hung Yen province

### **General information** (up to 01/Oct/2003)

- + Natural land of Hung Yen: 92,309.3 ha
- + Agriculture land: 63,450 ha
- + Special use land: 16,237.1 ha
- + Housing land: 7,442.5 ha
- + Unused land, rive and stream land: 6,026.8 ha

#### ***I. Agriculture land: 63,450 ha***

- + Annual crop land: 55,282.2 ha  
Of which rice land 50,021.0 ha
- + Garden land: 2,207.1 ha
- + Perennial tree land: 1,021.0 ha
- + Water surface with aquaculture: 4,092.7 ha

#### ***II. Forestry land with forest***

#### ***III. Special use land: 16,237.1 ha***

- + Construction land: 1,851.1 ha
- + Transport land: 6,616.5 ha
- + Irrigation and water surface for special use: 6,124.1 ha
- + Cultural and history monument land: 60.4 ha
- + Military security land: 79.5 ha
- + Construction material making land: 260.4 ha
- + Other special land: 1,245.0 ha

#### ***IV. Housing land: 7,442.5 ha***

- + Urban housing land: 681.7 ha
- + Rural housing land: 6,761.0 ha

#### ***V. Unused land, rive and streams land: 6,026.8 ha***

- + Plat unused land: 506.8 ha
- + Unused water surface: 1,813.6 ha
- + Rives and streams: 3,672.4 ha
- + Other unused land: 33.9 ha

#### ***VI. Demography:***

- + Provincial population (year 2003): 1,113,489 people.
- + Population density: 1,206 people / km<sup>2</sup>.
- + Administrative unit: Total 160 units including 9 towns, 145 commune, 6 wards.
- + City and province border on: Ha Noi, Ha Nam, Hai Duong, Thai Binh, Bac Ninh.

**Meteorology and hydrography****Table 11: Average temperature by month and year (Unit: °C)**

	1997	2000	2001	2002	2003
<i>Average per year</i>	23.7	23.4	23.4	24.2	24.4
January	18.1	17.7	17.9	17.2	16.5
February	16.4	16.0	16.9	24.1	20.3
March	20.4	19.7	20.7	21.7	21.4
April	23.9	24.6	23.8	24.9	25.6
May	27.2	26.7	26.4	27.0	28.2
June	29.0	27.9	28.6	29.2	29.6
July	28.3	29.1	29.4	29.2	29.5
August	28.5	28.2	28.4	29.0	28.5
September	25.1	26.3	27.5	27.9	27.2
October	25.4	24.4	25.4	26.8	25.5
November	23.0	20.5	19.7	24.6	22.6
December	18.6	19.5	17.0	20.5	17.2

Source: Hung Yen Centre for meteorology and hydrography

**Table 12: Sunlight hours by month and year (Unit: hour)**

	1997	2000	2001	2002	2003
<i>Total per year</i>	1,646.4	1,414.5	1,404.2	1,285.0	1,576.3
January	75.3	52.5	62.6	82.7	118.7
February	42.8	20.4	31.5	24.0	74.5
March	45.1	43.3	62.4	35.1	78.5
April	90.0	91.3	66.1	106.3	126.7
May	193.0	152.7	143.3	154.3	188.8
June	179.5	154.1	166.3	148.0	174.2
July	211.3	209.3	161.3	120.3	251.8
August	181.2	166.2	168.0	165.2	126.3
September	185.0	137.2	180.5	146.0	154.9
October	173.7	126.4	107.0	144.0	163.3
November	139.9	158.9	186.4	94.1	121.5
December	129.6	102.5	68.3	64.5	97.0

Source: Hung Yen Centre for meteorology and hydrography

**Table 13: Rainfall by month and year (Unit: mm)**

	1997	2000	2001	2002	2003
<i>Whole year</i>	2,031.7	1,286.2	2,037.7	1,176.8	1,308.3
January	73.2	7.0	49.2	1.9	24.5
February	11.6	18.4	27.0	23.9	41.5
March	85.3	38.0	116.5	8.8	35.0
April	284.4	65.9	33.8	44.5	74.8
May	91.1	144.0	235.9	296.6	216.5
June	258.1	111.8	186.2	156.3	217.8
July	400.4	153.6	274.6	138.0	139.9
August	256.2	257.9	456.0	118.7	226.2
September	264.5	282.2	178.0	93.2	300.4
October	121.4	169.4	368.5	213.3	20.3
November	31.4	29.0	51.3	50.6	7.4
December	44.1	9.0	60.7	31.0	4.0

Source: Hung Yen Centre for meteorology and hydrography

**Table 14: Average humidity by month and year (Unit: %)**

Year	1997	2000	2001	2002	2003
<i>Average per year</i>	86	86	86	86	84
January	84	86	84	82	85
February	86	89	86	91	88
March	92	93	90	88	85
April	90	90	92	87	87
May	87	87	86	86	86
June	80	86	86	85	81
July	87	85	85	85	85
August	87	85	87	87	89
September	89	88	85	83	87
October	85	85	86	83	79
November	82	76	80	84	79
December	84	76	85	87	79

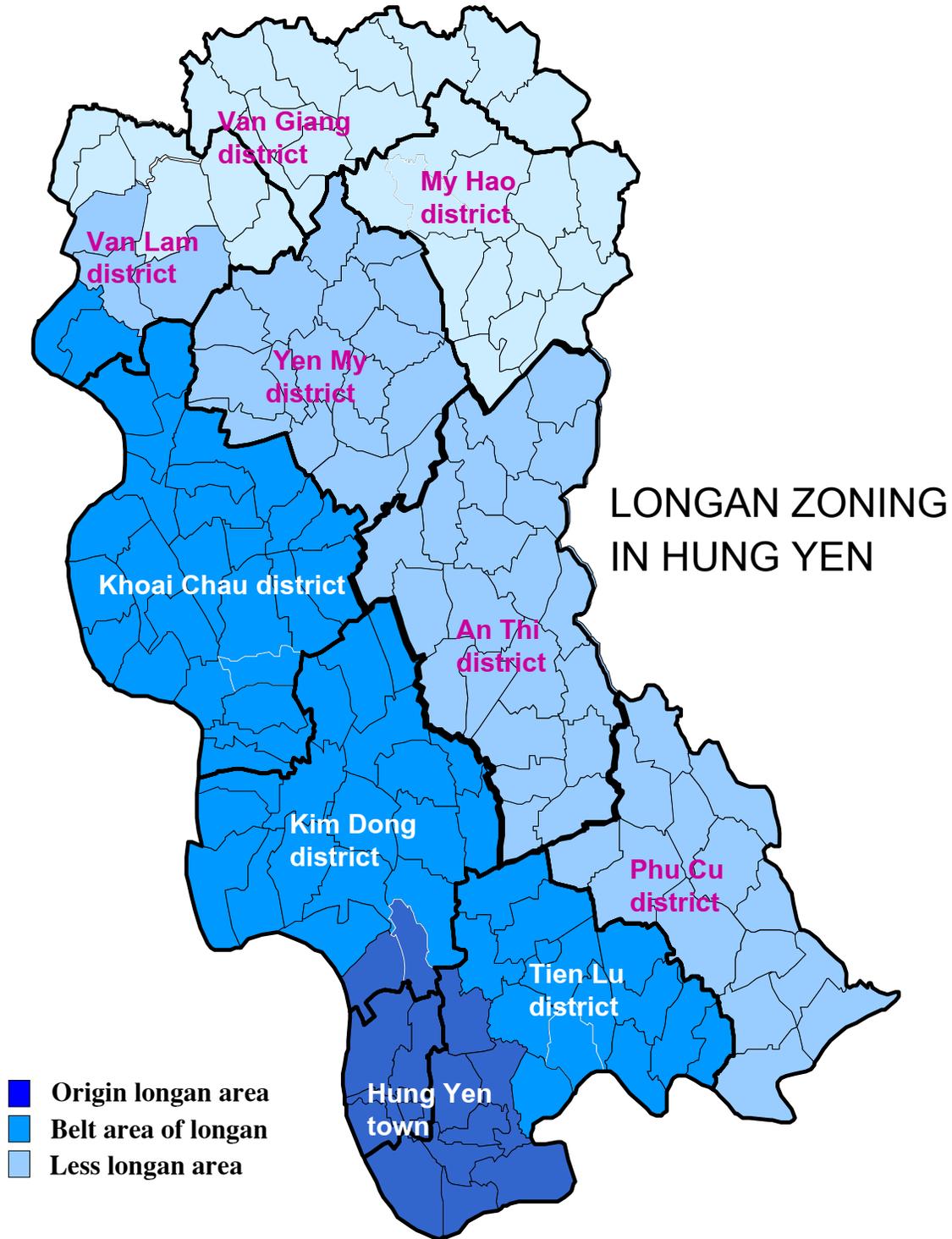
Source: Hung Yen Centre for meteorology and hydrography

**Table 15: Area, Productivity, and Production for the perennial trees**

	Unit	2000	2001	2002	2003
<b>Total</b>	<b>Ha</b>	<b>6,273</b>	<b>6,553</b>	<b>7,015</b>	<b>6,824</b>
<b>I. Industrial plants</b>					
<b>II. Fruit trees</b>	<b>Ha</b>	<b>5,995</b>	<b>5,863</b>	<b>6,303</b>	<b>6,211</b>
<b>1. Orange, lemon, mandarin</b>					
- Existing area	Ha	626	620	859	1,093
+ New planted area	”	4		39	437
+ Mature tree area	”	580	620	639	656
- Productivity	100 kg/ha	95.00	90.00	106.00	117.07
- Production	Ton	5,510	5,580	6,770	7,680
<b>2. Banana</b>					
- Existing area	Ha	3,160	2,935	2,491	2,073
+ New planted area	”	38			77
+ Mature tree area	”	2,915	2,935	2,488	1,997
- Productivity	100 kg/ha	170.00	172.00	110.00	201.71
- Production	Ton	49,550	50,482	45,275	40,281
<b>3. Litchi, longan</b>					
- Existing area	Ha	1,502	1,615	2,384	2,304
+ New planted area	”	33	133	135	367
+ Mature tree area	”	1,326	1,470	2,013	1,937
- Productivity	100 kg/ha	95.00	17.69	115.40	66.06
- Production	Tan	12,597	2,600	23,230	12,795
<b>4. Pomelon</b>					
- Existing area	Ha	52	48	53	51
+ New planted area	”	-	-	-	0
+ Mature tree area	”	52	48	53	51
- Productivity	100 kg/ha	115.00	120.00	127.00	154.51
- Production	Ton	598	576	673	788
<b>5. Juju</b>					
- Existing area	Ha	655	645	716	690
+ New planted area	”	2	-	30	0
+ Mature tree area	”	647	645	679	690
- Productivity	100 kg/ha	145.00	150.00	160.00	170.61
- Production	Ton	9,381	9,675	10,880	11,772
<b>III. Other perennial trees</b>					
<b>Mulberry</b>					
- Existing area	Ha	278	690	712	613
+ New planted area	”	8	318	22	0
+ Mature tree area	”	270	680	712	613
- Productivity	100 kg/ha		175.00	188.00	182.68
- Production	Ton		12,075	13,417	11,198

Source: Provincial Statistical year book 2003

Graph: Preliminary Zoning longan areas in the province



**Table 16: Some longan varieties in the province**

Longan variety	Tree characteristics	Fruit characteristics	Fruit weight	Flesh rate	Location
<b>“Long” longan (Big)</b>	Dark green leaf, less shiny, thick with ruffles leaf.	Big fruit, thick flesh, brown yellow sections overlap at the top of the fruit. Ripe fruit is crispy, strong sweet, aromatic. Loose grip between seed and flesh, between flesh and cover. Fruit size is evenly.	11-12 gram/fruit	62.7%	Mainly in Hung Yen town and Ten Lu district
<b>“Huong Chi” longan</b>	Low height and semi-globed shape tree. Dark green, shiny and high density leaf.	Crispy and sweet flesh, small seed, thin cover, nice appearance, aromatic. High productivity.	11-13 gram/fruit	>60%	Mainly in Hung Yen town and Ten Lu and Khoai Chau district
<b>Flesh longan</b>	Leaf is similar to that of the big longan.	Globed-shape, little bit flattens, yellow-brown but not light cover, flesh sections overlap. Ripe fruits give crispy flesh, sweet, less of water. It's less aromatic than the big longan.	8.5-11.5 gram/fruit	58-63%	Evenly located in the province but more concentrated in Khoai Chau district
<b>“Duong phen” longan (Sugar candy)</b>	Leaf is smaller than that of the big longan and the flesh longan. The blowing and harvesting season are latter than those of the flesh longan from 9-15 day.	Covers and fruit bunch style like those of the big longan, but the fruit size is smaller. Flesh is thick, the fresh surface has small knots looked like a sugar candy knots. It is special aromatic, shapely sweet.	7-12 gram/fruit	60%	Location scattered but concentrated in Hung Yen town and Tien Lu district
<b>“Bam bam” longan</b>	The fruit size is almost as large as the big longan's one. The bottom of the fruit is a little distorted, thick and dry flesh, light sweet taste.		12-15 gram/fruit		Location in the whole province
<b>Paddy longan</b>	Small fruit size. There are many fruit in one bunch. Thin flesh, difficult to separate from its seed, rich of water, big seed, moderately sweet.		5-7 gram/fruit		Location in the whole province

<b>Water longan</b>	Tree produces plenty of fruits, small fruit size, thin and flabby flesh, rich of water, low sweet, closely stick between seed and flesh.	6-9 gram/fruit	38.63 %	Location in the whole province
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## X. List of people interviewed

### Farmer

Ord	Name	Address	Ord	Name	Address
1	Nguyen Hoang Vien	Ne Chau-Hong Nam	21	Lê Văn Kiệt	Phuong Do- Hong Chau
2	Bui Van Cung	Ne Chau-Hong Nam	22	Phạm Văn Trường	Phuong Do- Hong Chau
3	Trinh Văn Hùng	Ne Chau-Hong Nam	23	Lê Văn Hữu	Phuong Do- Hong Chau
4	Trịnh Văn Hiệp	Ne Chau-Hong Nam	24	Trần Văn Toàn	Phuong Do- Hong Chau
5	Trịnh Văn Thịnh	Ne Chau-Hong Nam	25	Nguyễn Văn Hoàn	Phuong Do- Hong Chau
6	Trịnh Văn Toàn	Ne Chau-Hong Nam	26	Trần Xuân Tặng	Phuong Do- Hong Chau
7	Bùi Văn Giếng	Ne Chau-Hong Nam	27	Phạm Hữu Dự	Phuong Do- Hong Chau
8	Nguyễn Xuân Kỳ	Le Nhu Ho-Hong Nam	28	Trần Văn Mùi	Phuong Do- Hong Chau
9	Hà Văn Tái	Le Nhu Ho-Hong Nam	29	Trần Văn Hổng	Phuong Do- Hong Chau
10	Hà Văn Hoạt	Le Nhu Ho-Hong Nam	30	Trần Văn Tập	Phuong Do- Hong Chau
11	Bùi Trí Tài	Le Nhu Ho-Hong Nam	31	Vũ Văn Trung	Phuong Do- Hong Chau
12	Nguyễn Trọng Doanh	Le Nhu Ho-Hong Nam	32	Nguyễn Anh Phương	Phuong Do- Hong Chau
13	Nguyễn Văn Thà	Le Nhu Ho-Hong Nam	33	Đỗ nguyên Hữu	Phuong Do- Hong Chau
14	Hà Văn Thờng	Le Nhu Ho-Hong Nam	34	Nguyễn Đức Hoà	Nam Tien-Hong Chau
15	Hà Văn Cao	Le Nhu Ho-Hong Nam	35	Phạm Viết Tha	Nam Tien-Hong Chau
16	Dương Văn ánh	Mau Duong-Hong Chau	36	Vương Văn Thu	Nam Tien-Hong Chau
17	Trần Thị Mơ	Mau Duong-Hong Chau	37	Phạm Văn Phú	Nam Tien-Hong Chau
18	Vũ Quang Tự	Mau Duong-Hong Chau	38	Nguyễn Văn Vượng	Nam Tien-Hong Chau
19	Nguyễn Ngọc Du	Mau Duong-Hong Chau	39	Phạm Văn Tuấn	Nam Tien-Hong Chau
20	Phạm Văn Luân	Mau Duong-Hong Chau	40	Cao Văn Bài	Nam Tien-Hong Chau
Group		Name	Address/Office		
<b>Local offices</b>		Nguyễn Văn Tuấn	Science section- DARD – Vice chairman of Gardening Association		
		Nguyễn Văn Lương	Department of technology sciences and Environment		
		Trần nguyên Tháp	Head of Crop section -DARD		
		Mr. Tráng	Specialist of Crop section –DARD		

	Mr. Tâm	Head of policy and process section – DARD
	Mr. Tâm	Deputy head of hamlet Ne chau-Hong nam
<b>Seedling producers</b>	Mr. Minh	Hong Nam commune- seedling producers
<b>Traders</b>	Family of Mrs. Lan- Hung Yen town	
	Hà Xuân Thủy- Collector-Ky Linh Ho-Hong Nam- Hung Yen town	
	Vũ Văn Chung- big traders-Phuong do-Hong chau- Hung Yen town	
<b>Processors</b>	Trịnh Văn Lạp-Ne chau-Hong Nam- Hung Yen town	

## XI. Reference documents

1. Statistical year book of Hung Yen province -2003, 2004
2. Agriculture and rural development plan for Hung Yen province to year 2010 Annual progress report for Agriculture for Hung Yen province -2001, 2002, 2003, 2004
3. Report on agriculture production and processing in the province 2001-2004
4. Question and Answer on litchi and longan-Professor-Dr. Tran The Tuc- Agriculture Publishing house