

## REPORT ON VALUE CHAIN OF HO CHI MINH SAFE VEGETABLES

### I. INTRODUCTION

Vegetables are the essential food that cannot be absent in people’s daily meals. The matter of hygiene and safety of food to guarantee the health of the population has become hotter day by day, in which the demand for green vegetable achieving safety standard is increasing, particularly in big cities, and especially in Ho Chi Minh City.

Even from the years 1996-1997, Ho Chi Minh City was one of the first locality in the whole country to develop a program for producing safe vegetable. The City had undertaken the project and step by step established areas for producing safe vegetables districts and villages, particularly areas outside of the city. The growth of vegetables outside of the city was closely connected to the agricultural production and the urbanization of the city premises.

In general, all levels of the government as well as local entities were much concerned about the program to produce safe vegetables in the city. The program to produce safe vegetables in Ho Chi Minh City had been implemented under various forms; from training, propaganda on the safety aspects of vegetables, taken soil samples for testing to determine areas suitable for growing vegetables, support farmers to grow vegetables safely in screened house.

However, the production of safe vegetable in Ho Chi Minh City still has some problems needed to be solved: planning cultivation surface for safe vegetables in the whole city, doubling the output of safe vegetable to meet nearly 70% of the city’s demand, connecting factors in the value chain: from farmers to collectors/ traders, wholesalers/ retailers and supermarket..., the harvest, preliminarily processing, packaging, labeling, preserving, transporting as well as consumers’ awareness and usage of safe vegetables are still poor.

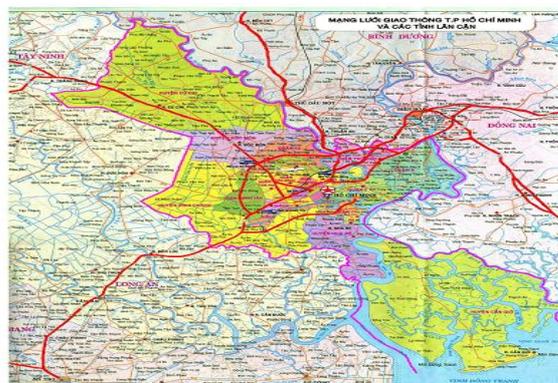
In this chapter, we would do research on safe vegetables in HCM and do analysis its value chain. Based on the research findings, we would present some recommendations to effectively organize, train and support the factors participated in the value chain.

### II. GENERAL INFORMATION ABOUT HO CHI MINH CITY AND SAFE VEGETABLES OF HO CHI MINH CITY

#### I. Ho Chi Minh City

Ho Chi Minh City is located between the rich southern provinces, bordering in the south with the south-eastern provinces and the northern border of the south-western provinces. This is the main communication thoroughfare, connecting all provinces in the region and is the international gate... The natural land surface of the city is 2,095,239km<sup>2</sup>. In which, the agricultural areas are 68,692ha occupying 32.7% of the natural land

**Map of Ho Chi Minh City.**



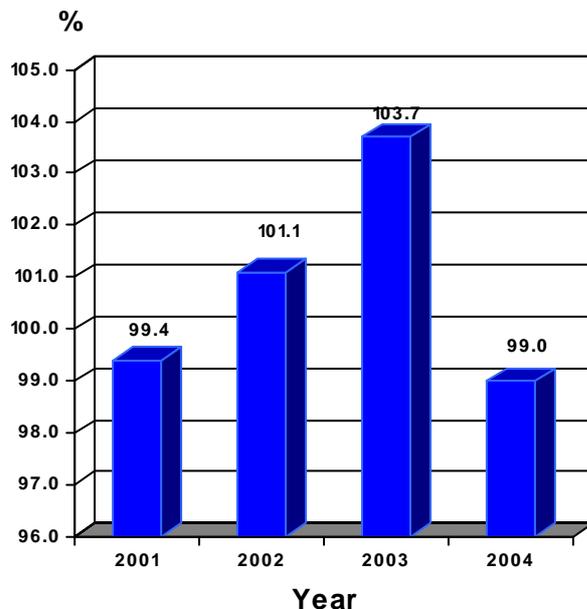
The city soil has the transitional characteristics between the South-Eastern provinces and the Mekong Delta. Even though the richness of the soil is not equal to other provinces’ in the area, with studies, suggestions, advice as well as the direct guidance of the Department of Agriculture & Rural Development, localities and local production entities have implemented many economic-technical solutions as well as invested and supported farmers. Therefore, the potential of the land, the agricultural & rural economy have improved greatly day by day.

Compared to other regions of the whole country, the weather of Ho Chi Minh City is relatively temperate, with rare natural disaster. The weather has two distinct seasons; the rainy season lasts from May until November, with an average rainfall of 1,979mm. The dry season lasts from December until April of the next year. The annual average temperature is 27.55°C, and without winter. With suitable land characteristics and weather, Ho Chi Minh City is the ideal location to develop the production of safe vegetables. If farmers know how to exploit toward the stable and clean agriculture, then the output and profit will increase significantly.

As the most crowded and biggest city in Vietnam, Ho Chi Minh City is a conglomerate of many ethnics such as: Viet, Chinese, Khmer, Champa... with a population of 6,062,993 people, high population density of 2,894 people/km<sup>2</sup> (Statistical yearbook, 2004). Thus, Ho Chi Minh City – the biggest economic center of the whole country – is also the biggest consumption center. Therefore, the expansion of the areas for the supply of safe vegetables is very much essential.

The difference in population between the urban and rural regions (based on Annual Statistics data, urban population occupy 85% while rural people account for 15%) is one of the more important element that causes the “demand” of safe vegetables consumption becomes very high\*. The urban population with high living standard and intellectual, recognize the benefits of safe vegetables and are willing to pay more to guarantee the quality of their lives. Besides that, the GDP growth in cities is higher than the average increase of the whole country (average of period 2000-2010 strive to reach 12%/year. The period from 2001-2005 saw an average of 11%/year). HCMC average GDP increases from US\$1,350 in 2000 up to US\$1,980 in 2005> This shows that the population of HCMC has the highest living standard of the whole country.

On agricultural aspect, due to the economic, politic and social situation, HCMC mostly take the route of industrial and service development and high urbanization. Land for agriculture of the city decreases gradually, affecting the total agricultural production value in 2004. There is a quite high decrease of agricultural production value when comparing 2004 and 2003. (refer to chart 11).



\*Taking only the year 2002 into account, each day, the city consumes 1,200 tons of various vegetables, among which only 20 tons are safe (source 1, appendix 10). Even though up to now, the land for the production of safe vegetables have been expanded, still it cannot satisfy the big demand of the market.

Chart 11: Agricultural production value speed of growth, based on comparing price of 1994 (%). (Source: Statistical yearbook, 2004).

## **2. HCMC safe vegetables**

### **2.1 The concept of safe vegetable**

#### **2.1.1 The Ministry of agriculture & rural development' s concept**

In the program for the development of safe vegetables, the Ministry of Agriculture and Rural Development has defined the concept of safe vegetables as follows:

*“Fresh vegetables (composed of all greens that can be eaten: bulb, stem, leaves, flowers, fruit) with quality equaling their characteristics. The density of poisonous chemicals and the degree of infection by harmful bacteria are under the allowed standard, guaranteeing the safety of consumers and the environment... are considered vegetables guaranteeing food safety and hygiene, in short “safe vegetables”. (Source 8, appendix 2)*

It is very necessary for farmers to understand this concept and strictly comply with its requirements once they want to grow safe vegetables in an accurate technical process.

#### **2.1.2 The farmer’s concept (refer to article 6, chapter 2)**

Based on focus group discussions of farmers in Cu Chi conducted by Axis, farmers give the following concepts about safe vegetables:

- + Farmers growing safe vegetables must attend training classes and:
- + Use chemicals correctly (with separation according to instruction of packaging, 3-7 days)
- + Manure should be composted before use
- + Clean source of water
- + After completing one harvest, land should be left idle for 2 to 3 days
- + Should have screen house (avoid the rainy season)
- + Must have brand, country of origin

According to them, it is very difficult to differentiate between safe vegetables and non-safe ones. Mostly looking at labels and country of origin.

#### **2.1.3 Consumer’s concept (refer to article 6. chapter 6)**

The following part provides more details about the process of growing safe vegetables which is stipulated by The Ministry of Agriculture & Rural Development

## **2.2 Summary of growing process (pictures 4&5, appendix 11)**

### **2.2.1 Requirement of growing soil**

Soil should not be affected by industrial waste, traffic, populated areas, hospitals, cemeteries, meaning harmful elements to people and the environment.

After a harvest, the soil must be sun-bath for 2-3 days then turned over to become soft for next planting. This work is mainly manual. Farmers have not been equipped with machinery such as soil returning machine. So for a surface of 1,000m<sup>2</sup>, this kind of work is very hard.

### **2.2.2 Requirement on fertilizers**

Only use organic fertilizers like green fertilizer, cattle manure that have been composted, strictly do not use fresh manure. The quantity of manure should depend on the concrete standard regulated in process for each specific vegetables, especially with vegetables for eating leaves, the use of manure must be stopped before harvesting 15-20 days.

### **2.2.3 Watering**

Only use drilled well water, water from big pockets are not polluted by harmful chemicals. Strictly do not use waste water from industrial zones, the city, hospitals, populated areas, ponds and trapped water.

## 2.2.4 Pest prevention

We should apply the integrated pest management method which is less harmful to people and the environment.

- Seed: Select the best seed, seeding plants should be free of pest before taking out of the seeding garden.
- Planting measures: should apply strictly the planting measures to limit the conditions and sources of proliferation of pest on vegetables. Pay attention to implement the rotational cultivation for rice and vegetables or inserted the growing of different kind of vegetables to lessen the occurrence of silk worms and other harmful worms.

A number of vegetable types need to have screened house to prevent the infiltration of disease worms.

- Use of chemicals: Use chemicals only when really necessary. Should inspect for appearance of disease worms, instruct the use of chemicals by technical officials. Guarantee the separation period before harvesting according to the instruction on label of each type of chemical.

**Thus, before the growing of safe vegetables, it is essential for farmers to go through the technical training class organized by the Agricultural department. These training courses should concentrate on carefully providing knowledge on the planting process as explained above.**

## 2.3 Development history of safe vegetable

### *Period before 1998*

This is the pre-feasibility period of the HCMC project for the development of safe vegetables. The Ministry of Agriculture and Rural Development has stipulated decision 67/1998-BNN-KHCN dated 28 April 1998 on “Temporary Regulations on the production of safe vegetables”. This was the first and only legal document related to the production of safe vegetables.

During this period, the development of safe vegetables (clean vegetables) outside of the city perimeters stopped at the research, established experimental models, demonstration on the use of safe crop protection chemicals. The consumption of safe vegetables had not appeared in the mind of producers and urban consumers.

### *Period from 1998 - 2001*

In this period, the City has a policy to undertake the program to produce clean vegetables through Announcement n<sup>o</sup> 395/TB-UB dated 24 April 1996 on the approval of the implementation of program for clean vegetables of the City. Thus, the production of safe vegetables received better concern. On that basis, safe vegetables production groups in Cu Chi district have gradually taken shape and was the foundation for the establishment and development of future safe vegetables groups.

### *Period from 2001 - 2003*

During this period, the Agricultural department has cooperated with the People’s Committee of districts and counties having production of vegetables to undertake the program simultaneously. The land for growing and the number of production groups have increased significantly: the surface for growing safe vegetables has reached 700 ha, with 13 production groups of safe vegetables. In this period, there was remarkable change in the perception of farmers and consumers toward safe vegetables products.

### *From 2004 to the year 2010*

To meet the demand for safe vegetables that is increasing day by day, in the program to develop safe vegetables until 2010 (which has been approved by HCMC People's Committee according to Decision 104/202/QD-UB dated 19 September 2002) as followed:

Table 9: Plan for the development of cultivation surface of safe vegetables 2005-2010

Unit: ha

Districts/Counties	Year 2005		Year 2010	
	Total Surface	Surface of safe vegetables	Total Surface	Surface of safe vegetables
Củ Chi district	3.600	2.000	3.900	3.900
Hóc Môn district	1.000	800	900	900
Bình Chánh district	2.000	1.000	1.700	1.700
Other district	2.000	700	1.500	1.500
<b>Total</b>	<b>8.600</b>	<b>4.500</b>	<b>8.000</b>	<b>8.000</b>

(Source 12, appendix 10)

The above table shows that the City People's Committee has great commitment to the change of plant growing structure: until the year 2010, the urban surface reserved for growing vegetables will be 100% safe vegetables, and the land for growing will increase to almost 44%. However, the speed of urbanization is increasing strongly, land for production quickly shrinks so it would be difficult for the surface for growing vegetables to expand. Meanwhile, growing safe vegetables is more beneficial compare to normal vegetables on the same land surface. Thus, the growing of vegetables will gradually change over to safe vegetables. With the expansion of land for growing safe vegetables and the increase of demand as in the present situation, the plan of the City People's Committee can fully be achieved.

#### 2.4 Surface, productivity, output

As mentioned above, the City planning of industrial zone, moving factories, expansion of city's premises have narrowed down the planting surface. The areas most affected are Binh Chanh and Hoc Mon districts, due to the urbanization and industrialization process. Still, the surface for growing safe vegetables is increasing quickly through the years. (refer to table 10).

Thus, the current agricultural areas of the City is 68,692 ha. Surface of safe vegetables is 1,880 ha (source 7, appendix...), an increase of about 95.5% compare to the year 2000.

Table 10: Surface increase speed of safe vegetables

	2000	2001	2002	2005
In which the surface of safe vegetables (ha)	<b>82</b>	<b>134</b>	<b>500</b>	<b>1.880</b>

(source D4, appendix 10)

The Department of HCMC Agricultural & Rural Development anticipates that from 2006-2010, the City will expand its surface for growing vegetables up to 6,700 – 8,700 ha, an increase of 5-6 times compare to the present. At that time, 100% of the surface will safe vegetables. (source 7, appendix 10).

The areas for growing safe vegetables are mainly gathered in districts Hoc Mon, Binh Chanh, Cu Chi, some in district 9 and district 12. Cu Chi is the biggest region where safe vegetables are grown with an approximate surface of 1,800 ha (source 2, appendix 10.). At these areas, the varieties of vegetables are very diversified (pictures 1, 2 & 3, appendix 11). Farmers often grow wide varieties of vegetables to meet the various demands of consumers.

According to the Agricultural and Rural Development Department, at present the main varieties of vegetables grown on the City's areas can be divided into 6 groups:

1- Vegetables for edible leaves, short planting time: amaranth, morning-glory, tan o vegetable, kailan, curly kale, lettuce, malabar spinach, kale, bac ha vegetable; estimated output of about 65,000 tons/year.

2- Vegetables for edible leaves, long planting time: cabbage, Chinese cabbage, cauliflower; estimated output of about 9,000 tons/year..

3- Vegetables for edible bulb & fruit with short planting time such as cucumber, bitter melon, luffa, green beans, string beans, radish; estimated output of about 35,000 tons/year.

4- Vegetables for edible bulb & fruit with short planting time such as okras, tomato, egg-plant, chilli, gourd, squash ... estimated output of about 10,000 tons/year.

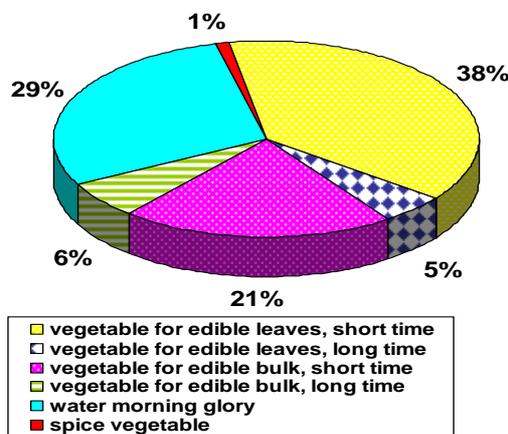
5- Water morning glory has an estimated annual output of about 50,000 tons (occupying 40% of all vegetable varieties)

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6- Spice vegetables such as corianders, chilli, green onion, basil (source 7, appendix 10.)

Following are the production market shares of these vegetables groups:

Chart 12: Production of safe vegetables (%)



As such, occupying more than 1/3 are the short planting time vegetables, following behind is the water morning glory (29%). Commonly grown vegetables are: kale, kailan, amaranth, morning glory, malabar spinach, lettuce, tan o vegetable. Achieving highest output on a m<sup>2</sup> is kailan 3-4 kg/m<sup>2</sup>. Morning glory is most easily grown and consumed due to very high demands (source: focus group discussion of Cu Chi farmers).

In general, there are about 45,000 households who grow vegetable in Ho Chi Minh city. ...). Registered households: 10,000 households. Besides there are 35,000 non-specialized households (D7, appendix 10).. Up to November 2004, the City has established 18 production groups of safe vegetables, comprising 858 households, with the highest number in Cu Chi, 12 groups. District 12 has only 1 group (source 2, appendix 10).

This shows that the policy of growing of safe vegetables of the City has received the support by the majority of farmers, firstly because the program has brought them high economic effectiveness, but due to a number of reasons (to be explained later), that at present, the program still cannot group the whole 100% of households to participate.

Even though the surface of safe vegetables dramatically increase each year, with the varieties of grown vegetables, the production does not increased significantly. With an average output of 20 tons/ha/harvest, the total output produced outside the City is about 165,000 – 170,000 tons/year. This output of vegetables can only satisfy 30% of demands of the whole city, with 70% imported from distant provinces (source 7, appendix 10.). Hence, the production of safe vegetables cannot satisfy the consumption need of safe vegetables of the urban population. (refer to the difficulties of farmers to understand more clearly about the reason.)

**To develop the safe vegetables growing areas, from the year 2001, the Agricultural and Rural Development Department has implemented the planning of areas for safe vegetables growing and evaluation steps of the soil, water and guide farmers to grow vegetables according to the safe vegetables production process on regional surface. Steps of the production process are as followed:**

- Step 1: Assessment of safe vegetables growing areas
- Step 2: Confirm areas that meet the safe vegetables growing condition, farmers are trained, educated and received necessary guidance, sign agreement to implement the safe vegetables growing process.
- Step 3 – Confirm the safe vegetables growing areas: Confirm the safe vegetables growing areas within 3 months, when vegetable samples do not contain residue of pesticide exceeding regulated limit.
- Step 4 – Reconfirm safe vegetables growing areas: regularly control the amount of pesticide residue in vegetables so that the areas meeting safety standard can be reconfirmed after one year.

Above is the process that have been implemented on HCMC premises. However, the regulations are not strict enough. For example 'the reconfirmation of of safe vegetables growing areas' does not specify how the samples would be taken, the time to control the residue of pesticide in vegetables is how long? The control method has not been widely taught concretely, so mistakes often happened.

## **2.5 Import-export information**

At present, safe vegetables are not exported under fresh nor frozen forms, but mainly processed products due to not having freezer storage and modern freezing process technic so it is very difficult to keep products during a long period (currently only 3-5 days).

The export of products occurs on small scale and separately for the Vietnamese community living abroad like in Australia...or some Asian countries, such as:Japan, Korea, China... The main transportation mean is by ship or by air. (Interview of processed companies).

According to officials of the Agricultural and Rural Development department of HCMC, the value of exported vegetables of HCMC occupies only about 1%, mainly spice vegetable. We will discuss more about export while analyzing the value chain (Export companies)

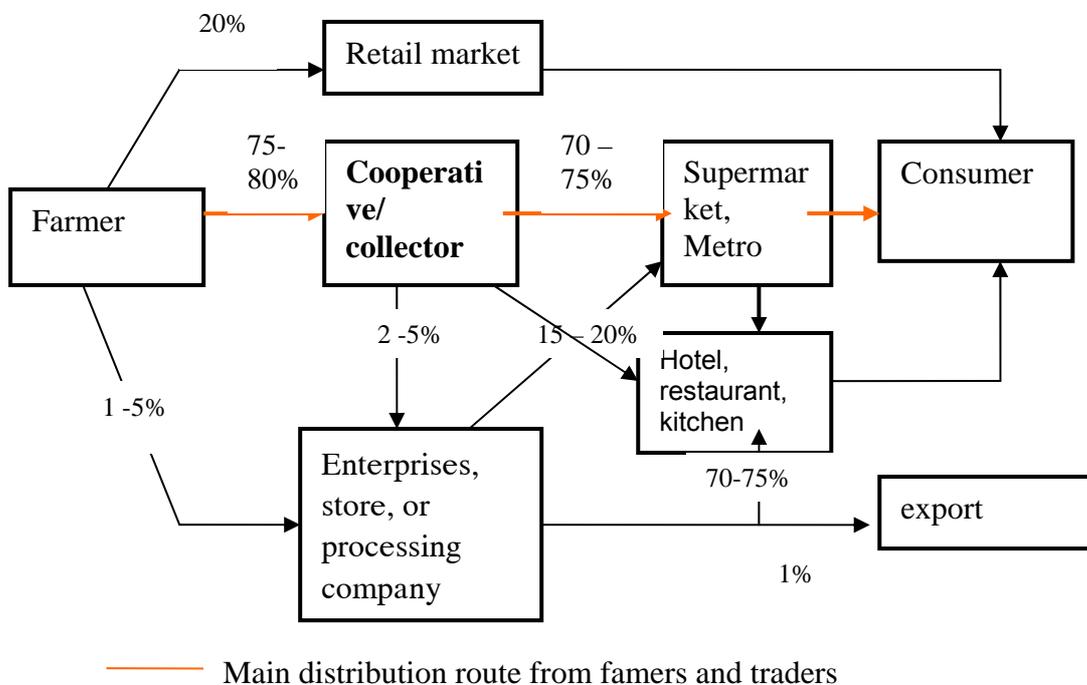
## 2.6 Confirmation & labeling

Confirmation of safe vegetable is based on the testing result of Vegetation Protection Office, The People Committee of Commune and/ or The People Committee of Ward should send a petition in writing to The People Committee of District in which request The People Committee of District to ask the Department of Agriculture & rural Development for a confirmation decision of the safe vegetable growing area. Up to the early of 2005, the safe vegetable growing area is 1,880 ha, of which the area is confirmed by The People Committee of the city is 634 ha (Source 14, appendix 10)

Labeling: According to the Department of agriculture & rural development , about 10 – 15 % of the output is labeled (refer to the list of businesses who announce the quality of safe vegetable, appendix 13)

### III. VALUE CHAIN OF HCMC SAFE VEGETABLE

Diagram 18: The value chain of safe vegetable



#### Common points

Compared to other vegetables and fruits, the value chain of safe vegetables in Ho Chi Minh City is strictly controlled. Members in the value chain have organized relationship with one another, in which the role of traders – cooperatives is considered important.

Safe vegetables Cooperative has come into form from vegetables farming households (or Safe vegetables Group). These Cooperatives have been mainly established for a goal of growing vegetables through a guaranteed safe process. Beside growing safe vegetables, some Cooperatives also proceed collecting products from farmers for supplying to shops, supermarkets, modern wholesale centers to set up a model of safe vegetables procurement.

A number of vegetables and fruits companies that run their own shops to supply restaurants and hotels with safe vegetables, these companies buy them directly from farmer households or from safe vegetables groups. The rest of safe vegetables (not being bought by companies and cooperatives) shall be retailed by the farmers in markets directly to consumers at lower prices

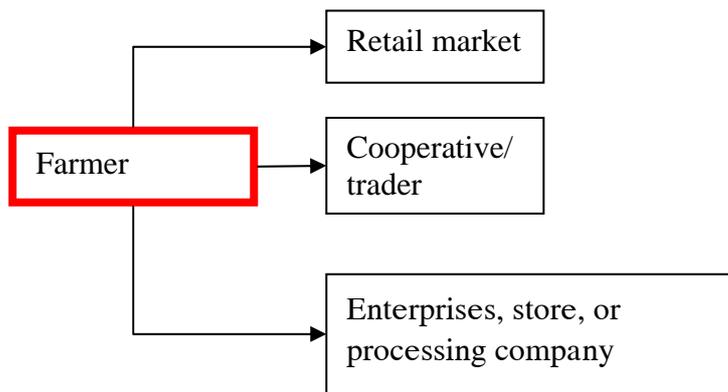
As such, supermarkets, shops are as well functioning the same kind of job as retailers. However, due to different dimensional scale and packaging, the price should then be much different.

As for processing companies, the processing of safe vegetables in the city have not been strongly pushed, so processing companies are working on small scale. The source of vegetable for processing is mainly from Dalat (refer more in the value chain of Dalat vegetable). Because of the fact that the standard processing requirement of vegetables must be done as depicted by the buying countries, so most of them do the growing themselves or cooperate with farmers closely.

We shall make an in-depth research of those involved in the value chain:

### 1) Farmer

Diagram 19: Farmers and their direct relationships



Generally each farmer grows a certain popular vegetable specie in an area from 200 m<sup>2</sup> to 1000 m<sup>2</sup> with alternative planting of various vegetables in- between crops, so the output of each crop is not too big to be left unsold.

At first, it depends on buyers (traders – cooperatives) and self-development to do the cultivation through personal experience and the orientation of Farming Encouragement Center. Later on it depends on the effect of cooperation, direct exchanges of farmers to find out various demands of clients, from which determination of species shall be made for cultivation..

Safe vegetables being planted by city farmers are mostly short time vegetables, because they are easy to plant , short time cultivation with rather high benefits and favored by consumers. Below is a table for reference of areas and productivity of certain short time vegetables in Cu Chi district:

Table: Areas and productivity of some short time vegetables being planted in Cu Chi

Kinds of vegetable	Planting time	Planting area	Productivity	Output	Interest
Water morning glory	25 days	500 m <sup>2</sup>	1.200 kg	2-3 kg/m <sup>2</sup>	1,500,000 đ
(Rosy weed)	22 days	200 m <sup>2</sup>	300 kg	1-1.5kg/m <sup>2</sup>	500,000 đ
Amaranth	35 days	200 m <sup>2</sup>	700 kg	2 kg/m <sup>2</sup>	1,800,000 đ
Green cabbage	25 days	1000 m <sup>2</sup>	2.000 kg	2 -3kg/m <sup>2</sup>	3,000,000 đ
Fresh cabbage	23 days	2000 m <sup>2</sup>	4,000 kg	2-3 kg	6,000,000 đ

(Source: farmers group discussion in Cu Chi conducted by Axis).

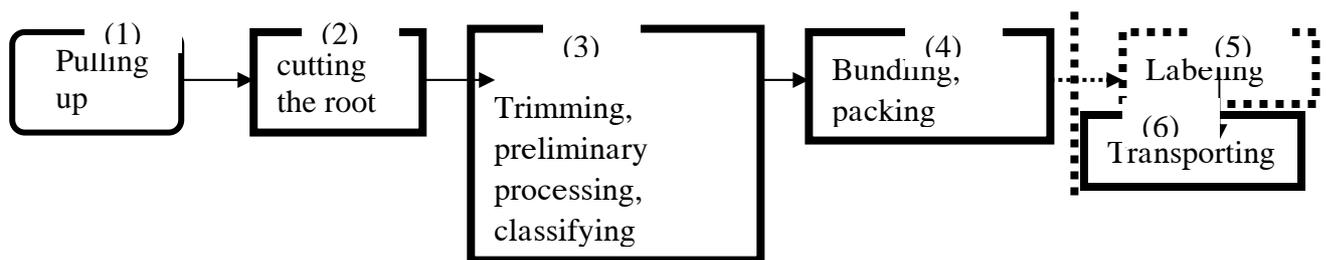
So, as for round-the-year vegetables, especially short time plants for leaves like amaranth, water morning glory ....there could be 8 crops per year with output of 2 -3 kg/ m<sup>2</sup>.

In one crop farmers usually grow various vegetable alternatively to get a pretty big profit, an average of 30 mn/ ha/ crop.

Plants for roots, for longtime leaves like cabbage, white cabbage, cauliflower, corn bean, tomato....there's less crops in the year, less output and less benefits than short time plants. In certain regions due to soil characteristics or habits, farmers only plant vegetables in a half year, plant paddy or let soil unused during the other half as they are not experience. However, it is not a common case.

Different from farmers who grow normal vegetables, farmers who produce safe vegetables must obey a strict production chain from cultivation time to cropping. Due to the target of this report, we focus on analyzing the value chain starting from cropping stage.

Diagram below (diagram 20) shows the post harvest of safe vegetable:



**1.1 Cropping** (see picture 4, appx.3): Generally, according to value chain, vegetables shall be collected in the early morning when they still look fresh, not yet loose water and weigh heaviest in the day. Some farmers themselves bring vegetable to retail market or to collecting point immetidately.

However, according to survey, if farmers sell to companies or cooperatives in Ho Chi Minh city, they pull up vegetables in the afternoon (usually from 4-5hours) when vegetables are dry, damage avoidable and easy for packaging and transport at night\*

**1.2 Cutting the roots** (see picture 7, appx. 11): roots shall be cut as requested after vegetables pulled up. Some companies, cooperatives, and clients who are retailers supplying products to canteen, kindergarten, collective cuisine...usually request roots to be cut off. However, at small local markets farmers don't cut roots to keep vegetables fresh, and only cut them when buyers want.

**1.3 Trimming** (see picture 7, appx. 3): this work is to remove yellow leaves, and bad-looking leaves, or when vegetables have uneven height... This is also an occasion to categorize vegetables to meet various demands of clients. In general, the quality of safe vegetables in HCMC is equally good.

Generally, the loss caused by cutting roots and trimming is about 10-15% but in rainy days it may go up to 50 – 60% (source: groups discussion in Cu chi). This loss is due to the cultivation process, it is counted for in farmers' productivity. The reason is mostly from weather and diseases.

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\* Other reason is dry vegetables heavier than fresh ones. and traders enjoy the benefits.

**1.4 Bundling** (see picture 10, appx. 11): Vegetables are tied together in bundles, weigh about 0,5 – 0,8 kg/ each as required by clients, string to tie them together is generally bamboo strips, nylon strings

**1.5 Labeling** (see picture 10, appx. 11): This is an obligatory and important duty to make consumers become aware that this bundle is a safe vegetable (see more on consumers section). However, in Ho Chi Minh city the labeling is not always done throughout, sometimes this is done by cooperatives – traders, not by farmers.

As mentioned above, when farmers retail their vegetables in markets without being labeled, they all look the same under normal eyes, not different between safe vegetables and normal ones in markets, therefore their prices are almost the same; and that's another reason for farmers not to label their vegetables. They don't even know that's the way to advertise the trademark of their safe vegetables in market

Generally if being sold to cooperative and if requested, farmers shall tie vegetables with strings with labels of that cooperative (certified by city department of Agriculture or vegetables protection office).

On label shall be inscribed with names of cooperative, origin and date cropped. When clients are supermarkets, farmers or cooperatives use this label along with other label of supermarkets. Supplying vegetables to cuisine, agencies, hotels and restaurants seldom requires label because they all know the cooperatives wherefrom they buy. .

#### **1.6 Packaging:**

Vegetables are put into plastic baskets, or deep bamboo baskets (see picture) to preclude damages in transporting, (about 20 or 50kg/ basket). Farmers usually lay the leaf part inward and stem outward, easy damaging vegetables underneath (see picture). Packaging time is 50 kg/ 1 hour.

**1.7 Transport** (see picture 16,17, appx. 11): Farmers carry products to markets or cooperatives. Means of transportation are mostly motorcycles, bicycles within a short distance, so damage is not considerable (1-2 % ) (group discussion in Cu Chi). This damage has been considered by cooperatives or companies at collecting points.

#### **In short:**

The majority of farmers cares for the cropping and brings products directly to collecting point. Some do the cropping, trimming, packaging and labeling on the spot and carry to Cooperative or Company like Phu Trung Safe Vegetables cooperative or Sao Viet Company....

However, buyer may not trust that farmers could follow the specification set by clients and that their benefits may be influenced, therefore, cooperative and company buy the whole plants and do this job by themselves (from cutting roots, trimming plants as specified) and the loss from the part of farmers is rather low (1-2 %).

In the post harvest stage of safe vegetable, the most important thing is time of collecting and packaging, which will help to confirm safe vegetables in proper way to minimize damages in transport. Specially, labeling is most concerned as a quantity of vegetables (about 20%, according to group discussion of farmers in Cu Chi) goes directly from farmers to markets without any label. In this case, safe vegetables could not show the value among normal vegetables, this is a loss for farmers\*.

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*\*in the city area 30 units have registered the quality of safe vegetables with the department of Agriculture. But the sources of products these enterprises buy are also from near-by provinces. Sample of vegetables for safe control is just a single representative, therefore a big quantity of vegetables available for sale in the city are not experimented*

### 1.8. Consuming and contracting

The consumption of farmers' vegetables mostly goes through Production Group (cooperative). However, farmers must actively help themselves in consuming the products because of small output, each farmer could not contact to sell to any units. Most practical is retailing in markets at current market prices.

Almost 75 - 80 % of safe vegetables are provided to cooperative by farmers whose only responsibility is to plant the species as required by Cooperative. This good way causes less damages and stable outlets. All contacts belong to the duty of Cooperative representative. Sale price is stable due to contract with clients. Although, purchasing price of cooperative sometimes is lower than market price, and sometimes farmers keep some vegetables to sell at markets for better price (minority).

Farmers sell products in the market or to cooperative (cooperative buys and sells to clients), or to companies, all is exercised by verbal contract. Settlement is always made immediately in cash. However the supply of vegetables through cooperative generally depends on clients, so the settlement shall be paid within 15 days.\*

*\* Sometimes buyers are late in payment, Cooperative has to prepay money to farmers (VND 500,000 – 1,000,000) so that they can buy seed for the next crop (farmer focus group discussion in Cu Chi)*

### 1.9 Difficulties and supports required by farmers growing safe vegetables.

Difficulties	Supports
<ul style="list-style-type: none"> <li>• Weather: In rainy season, farmers lost 50-60% after cutting, trimming. (source: group discussion in Cu Chi)</li> <li>• As for cultivation techniques, although farmers growing safe vegetables have recently received support and orientation, but in general, their cultivation techniques are not high, new technique application is still limited and not synchronous, mainly depending on personal cultivation experience.</li> <li>• Mechanization in cultivation. Mechanization in vegetable cultivation is not high, modern farming equipment is not enough, so productivity is low. Farmers would like to mechanize their farming works as soil striking, ploughing, and insectspray.</li> <li>• Capital investment for net house of 1000 m<sup>2</sup> at a cost of 25.000.000 dong, with depreciation within 3 years. Many farmers must lend capital from banks but loan procedure is still complicated according to them.</li> <li>• Allocation of vegetables.</li> </ul>	<ul style="list-style-type: none"> <li>→ Support with net house suitable with natural condition of each region (Cu Chi differs from Binh Chanh). Example: cabbage, salad suitable with ajar net while Chinese bean and French bean good with close net.</li> <li>→ Support with cultivation techniques, care and select anti-insect and disease species. Support with training courses to get in touch with modern techniques in order to replace manual method, to know how to classify and use spray effectively. .</li> <li>→ Farmers group discussion had a proposal: just one plough a farmer household can use for an area of about above 3000 m<sup>2</sup>, two households can use one plough for an area less than 3000 m<sup>2</sup>.</li> <li>→ Support farmers with capital, borrowing money at banks without mortgage required, simplify procedure for bank loans,</li> <li>→ Planning group production, further farming support and orientation.</li> </ul>

As for farmers who are not members of a cooperative, their production works are still primitive, application of new techniques, mechanization, application of techniques after cropping and transport shall become difficult.

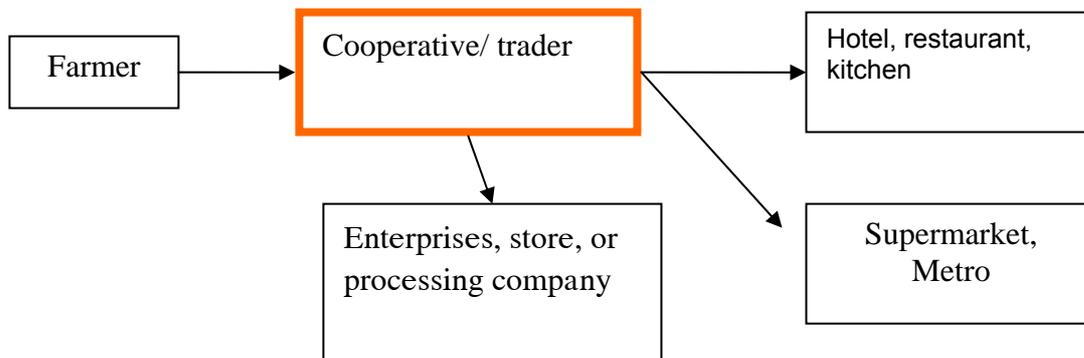
- Consuming outlet: as mentioned above, when cooperative shall not purchase or purchase at lower prices than in market, farmer shall suffer a lot.

→ keep farmers informed with news about market through mass media, to help them finding outlets for their products and diversifying products to meet market demand.

According to consuming cooperative model, farmers would like to have many more clients for the cooperative, so that they can feel secured in production. It needs advertisement for more clients.

## 2. Cooperative/ Traders (picture 19, 20 appx. 11)

Diagram 21: Traders and their direct relative



### 2.1 General characteristics .

This is the most important stage in the value chain. Production groups in model example or regional cooperatives\* act the role of traders

Traders generally have preparatory points for packaging, trucks for transport and offices... with a strong and effective workforce.

### 2.2 Scope of activity

In general, scope of activity of vegetable cooperatives is smaller than vegetable companies because the former only work in their own region and their marketing is limited. Cooperatives consumed an average 15 – 20 ton/month.

Vegetable companies have larger scope of activity. The consumption quantity of vegetables is much more diversified because they have different sources of vegetables. The Southern Vegetables and Fruits company is the biggest consumption company in Ho Chi Minh city, it renders a domestic supply of 700.000 – 800.000 tons annually. (source: interviews of 6 vegetable and root companies conducted by Axis.)

### 2.3 Purchasing procedure

Traders used to do the purchasing from farmers of the same region (round the year). According to orders placed by consumers, they make guaranteed contract with producers (obliged by credit and memo, procedure is not required) regarding categories, quantities; price is in particular depending on current market, then collecting and supplying products shall be done to deliver to buying units.

Companies usually trade with farmer or production group. They have collecting point so they can transport products to preliminary processing point by themselves. Companies buy vegetable as it be and do the preliminary process as requested by clients. Cooperatives collect products at their own preliminary processing point where vegetables shall be brought to by farmers

## 2.4 Post harvest

As mentioned in farmer's section, the stages after cropping are very important, in order to protect quality, most traders do these stages by themselves. They also participate in the process of cutting, trimming, classifying, bundle tie, packaging, labeling, transporting. However, compared to farmers, these stages have been proceeding with bigger and more careful scale. Below is the process:

### 2.4.1 Preliminary process (picture 8, appx.11):

Traders have their own preparatory point, the safe vegetable preparatory points of companies are better equipped than those of cooperatives. At collecting point, traders also do the preparation but better than farmers because the vegetables shall be cleaned by water (sometimes by ozone). Vegetables shall be carefully classified for each customer. Loss from this stage is about 10 – 15% (source: interviews with vegetable and fruit companies and cooperatives.)

### 2.4.2 Packaging and labeling (picture 10,11,12, appx.3):

This is the stage that speaks louder the role of traders in regard to quality protection and product advertisement. Traders do the packaging better than farmers. Companies have two ways of packaging as below:

- For cuisines, hospitals, schools... plastic bags shall be used for vegetables with label printed outside. (see picture, appx. ...)
- For supermarkets, sponge plate covered with plastic foil used for roots, fruits with label outside. (see picture, appx....)

Packaging done by cooperatives is as simple as that of traders for cuisines. Sometimes, the selling points pack products by themselves, sometimes not.

### 2.4.3 Storage, preservation (picture 13, 15, appx.11)

Vegetables are fresh products that could not be stored long after cropping at vegetable and root cooperatives and companies. Only some processing companies have frozen house for storage and preservation of products. All cooperatives have no frozen house, so vegetables must be consumed during the day or used for fertilizer. The loss rate is various. It depends on each crop & the change of the order. Until now the storage has not been considered.

**2.5 Transportation** (picture 13, appx. 3) : Vegetable cooperative and company carry these products to customers by normal trucks (no frozen truck), or by motorcycle (small quantity). The transport shall be done in early morning (fresh weather). Transport with farmers is simple, they use deep bamboo basket with vegetables piled on. For less damages traders use plastic baskets which could be placed on one another. Due to the experience of cooperatives and companies, loss during this short distance is about 2-5%.

## 2.6 Clients

2.6.1 Clients of cooperatives generally are supermarket, cuisine, kindergarten, hospital, school... the number of clients is small because of poor marketing, some clients come through introduction and self effort. Some cooperatives or farmers sell to retailers but with simple form.

2.6.2 Clients of vegetable and root companies are various thanks to their marketing efforts. They are mostly restaurants, hotels, cuisines (most cuisines are in industrial zones), supermarkets and retail shops for private consumers, in addition to some vegetables and roots processed for export to Japan, Korea, Hong Kong, China... However, the quantity exported is less than 10% of total products, according to the Southern Vegetable and Root Company.

The majority of products processed for export are corn bean, hot pepper, aubergine and roots like taro, big rooted taro, ginger, turmeric.... Leave vegetables are less exported due to lack of preservation system for at least 1 month (Source: in-depth interview with the Southern Vegetable and Root company and Cofidec). (picture 9, appx. 11)

## 2.7 Contract

As mentioned above, traders only practice verbal contracts or a written contract valid for one year. Except for small supply to cuisine, kindergarten, all big supply shall be done with written contract between cooperative or company and clients. Contents of contracts used to have general provisions as:

- 1) Responsibility relating to safe vegetables, in case of being poisonous. Sellers shall be responsible for it.
- 2) Good quality products, not a risk to health, no infection caused to consumers.
- 3) Clear indication of product standard and packaging.
- 4) Fixed price for a certain period of time, any change in price shall be notified for the next cycle.
- 5) Time for order, delivery, clean transportation.
- 6) Paper work, delivery bill
- 7) Settlement to be made within 10 – 15 days\*

## 2.8 Profit

Profit for cooperative is monetary calculation. If the average selling price about 3.500 đ/ kg subtracts all costs (about 3.000 đ/ kg), profit of cooperative – traders is about VND 500/ kg. Therefore the profit is about 20%

## 2.9 Favourable and difficult situations needed support.

Traders and cooperatives have favourable points as below:

- Traders have been supplied by farmers with best source of products and stable quantity because traders have had advance order for products with producers.
- Traders are cooperatives or production groups have opportunity to exchange experience and modern technologies and species with farmers. They also have long relationship with them therefore no written contract is required.
- Traders have private means of transportation; some companies have preservation and storage system for exporting purpose.
- Traders take initiative in sale price for better interest.

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\* *Contracts don't stipulate a regular buying obligation, no commitment of quantity, only mentioned in each order placement. No order slip, no delivery.*

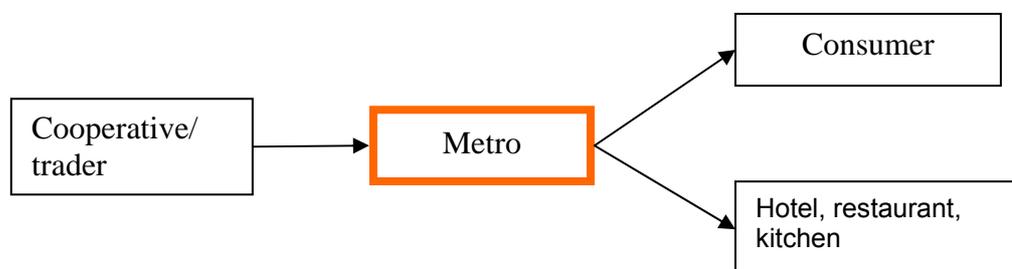
*Contracts don't mention requirement of label, it's naturally done by the company. Except Metro, label and safe vegetable must be mentioned.*

However, traders also meet difficulties as below:

Difficulties	Support required
<p><u>Preparatory</u>: because there's no preserving storage, the preparatory process, packaging, transport must be done fast, day and night to deliver to clients. These stages are still primitive, sometimes lack of hygiene.</p> <p><u>Processing</u>: the processing of vegetables and roots is still restricted because they don't know how to do, especially vegetables.</p> <p><u>Information, knowledge</u> : traders as companies may have some necessary knowledge but most of them are restricted in some concerning factors:</p> <ul style="list-style-type: none"> <li>• preservation</li> <li>• safe hygiene</li> <li>• sticking label</li> <li>• classification of categories of quality products.</li> <li>• Transportation</li> <li>• Collecting market information</li> </ul> <p>Traders meet with difficulties in <u>looking for clients</u>. Beside, <u>export</u> is still restricted specially for vegetables.</p>	<p>→ Upgrading facilities for preparatory process, packaging, grouping products is strictly necessary. It also helps to keep products safe, traders want to get in touch with new technologies to best carry out their jobs through modern processing and preserving facilities.</p> <p>→ Support with information and technological method of processing to obtain quality standard.</p> <p>→ Support traders with training courses for necessary knowledge as needed.</p> <p>→ a synchronous coordination of functioning agencies to find outlets for proceeding safe vegetables, in the city and abroad.</p> <p>Action should be taken rapidly, especially inviting foreigners to visit and sign memo (instead of visiting only).</p>

### 3. Wholesalers (picture 22, appx. 11)

Diagram 22: Wholesalers & their direct relative



In the distribution system of safe vegetables, there's not yet a wholesale market for this category, except some wholesale markets in HCMC, still regarded as traders. Only Metro wholesaler has various forms of providing vegetables and fruits for restaurants, hotels and individual customers. This business form in some way looks like vegetable companies, other way like supermarkets. Therefore, a general survey of vegetable and fruit company and supermarket could reflect a typical form of this business. However, compared to vegetable company or other supermarket, Metro has certain conditions to act as a wholesaler. Metro

organizes a large system of customers to whom a big quantity of safe vegetables could be supplied as required. Metro also has a frozen transport system for clients (17 – 18<sup>0</sup> C) it assures a good fresh product when being transported.

#### 4. Retailer/ supermarket (picture 23, 24, appx. 11)

##### 4.1 General characteristic

Retailers work around the year, purchase products from: farmers, companies or traders. Lots of retailers do the production and consume products themselves (farmers). They generally gather themselves at market or shops. Supermarkets in the city also are modern retailers.

- ❖ Retailers at market or shops are of small scale, only 1-2 workers, their business consist of many categories of vegetables and roots, of them are some safe vegetables and also not safe. The number of safe vegetables is about 20 -30 % of their shop products. Business turnover is about VND 50,000 – 500,000 /day for safe vegetables (source: interview at retailers conducted by Axis).
- ❖ Supermarket retailers Safe vegetables are part of vegetables and roots category, therefore supermarkets used to have more workers. A supervising team of 2-3 persons or more. The number of safe vegetables for sale in supermarket is much more than at other retailers'. Some supermarkets like Coopmart, Cora, Maximart disclosed that because they are of a system, they did not buy safe vegetables directly, but get them from main collecting center of mother market. Some others said they only do the administration and not the direct selling\* (like company Vy Vy, Sao Việt) therefore they don't know business turnover.

##### 4.2 Preliminary process

Retailers at wet market & small outlets rarely do preliminary process, packaging and labeling when selling to end-consumers.... For selling the other customers, these stages will be done more carefully, like mentioned in above sections. However, The process of these stages may differ a little bit in some places.

Diagram 23: Preliminary process at some typical retail outlet.

a) Metro, Coopmart: .

Cutting root → putting on the shelf → choosing to buy → packing (with label) → weigh

b) Miền Đông supermarket, Maximart)

Cutting root → weigh → packing (nylon, sponge plastic bag) → labeling, price → displaying

According to retailers, this processing chain causes less damages because most vegetables have been prepared before. The majority of retailers confirm this damage is only about **2-5%**. Some may be up to 10%. If irregular delivery procedure has been made, the retailers shall deduct the weight at will when payment.

**4.3 Packaging:** (see above table). There are two main packaging methods.

1- Nylon or sponge plastic bags

2- no packaging for customer to do the weighing.

**4.4 Labeling and certifying:** most retailers of safe vegetables with small scale don't label their products. The reasons are: they think their jobs are just to resell the products and the labeling is the responsibility of suppliers, some are confident that customers know where the products are from so they don't need labels. But some retail shops like Sao Viet Vegetable and fruit Company disclosed that 80% of vegetables at the shops have the company labels

on, not the label of safe vegetable cooperative (source: interviews conducted by Axis with retailers/ supermarkets).

The majority of retailers at markets or small shops replied when interviewed that the products they sell have not been qualitatively certified. They just recognize the vegetables by their own experience or by the source of products. Retailers need quality certification when being sold at supermarkets, Metro and when delivered to restaurants, hotels, kindergarten. This certification shall be issued by the city Agriculture department or Vegetal Protection Office. (source: interviews at cooperatives conducted by Axis.)

#### **4.5 Storage and preservation**

Majority of retailers don't store products.

Retailers at wet market: Retailers in wet market spray water on vegetables to freshen them. Therefore the loss rate is not considerable. (water sprayed for small quantity of vegetables which will be sold in a day)

Supermarket: They just sell them in the same day. Any left at the end of the day they just give away (donate to pagoda or so if the products still edible, or return them to company). Coopmart Thăng Lợi said that they don't preserve vegetables because they sell safe vegetables at small quantity, mainly to serve as a variety of products that shall be all consumed and no need for a preserving system.

Some shops and supermarkets have frozen system so they can keep products for 2 days (like Maximart or Cora An Lac). The stored vegetables must be preliminary processed again to leave out bad leaves. The ratio of loss in this stage depends on the products left. As for supermarket, vegetables of the day left over, they shall be kept for the next day and the loss shall be up to 3-5%/day (The loss shall double or triple if vegetables left till the second day) According to our research, when the damage is up to 30 - 35% out of total product left, the vegetables then shall be all destroyed. (Source: Interviews at supermarkets conducted by Axis)

#### **4.6 Transportation**

Transporting products from sellers to retailers: sometimes retailers at markets go to collecting points and carry products by themselves, while with supermarkets, the sellers (traders – cooperatives) take care the transportation. Means of transportation is various: bicycles, motor cycles or trucks (trucks are mostly used by traders or companies for products delivery.) (see picture 18, appx 11)

Transporting products from retailers to customers: in some occasions retailers deliver products to buyers' houses. (Coopmart.....) but sometimes customers come to buy products by themselves. Popular means of transportation is motorcycles. Vegetable companies have trucks for products delivery. In short, delivery could be handled by trucks or motorcycles as required. (see picture 18, appx.11 )

In general, retailers don't have any difficulties in transportation. However, the packaging method can easily make vegetable damaged, partly because of weather or long way of transportation. In order to prevent loss, they pay much attention to vegetables arrangement when transporting: put fragile products on top, like fresh cabbages on top and water morning glory underneath. The leaf part always put inward, stems outward if deep bamboo basket is used. Due to near distance & proper packaging method, the loss rate is very little (1 – 2%) depending on the means & distance (interviews retailers & supermarkets conducted by Axis)

#### **4.7 Clients**

Clients of retailers are consumers. A big quantity is also supplied to hotels, restaurants, coffee shops, canteens, kindergartens,....all aim at servicing consumers.

Because of different clients, the preparatory process also differs in respect of standard. In general, vegetables shall be prepared for cleanliness when delivered to kindergarten, canteen, restaurant.

#### **4.8 Contact and contract**

Popular deal between retailer and farmer is made by verbal contract.

Transaction with big restaurant, retailer also signs a contract. A deal with any kingergarten, a contract should have content: supply with safe vegetables from source of Cu Chi, settlement to be made within 7- 15 day/time, period of time: 12 months. (see content of contract above).

#### 4.9 Interest

Depending on locations of shops, markets that sale prices may differ to give different interests. Nearer downtowns, sale prices higher. Supermarket and shops enjoy highest sale prices, and their profit goes up to 40% - 50%. But according to vegetable and fruit companies, the interest after taxes paid may be only 5%-6%. At markets near farming areas retailers have to sell at cheaper prices. Interest average is from 10% - 15%.

#### 4.9 Hygienic safe for products

Supermarkets, restaurants, hotels, responsibility shall extend to suppliers of safe vegetables (Cooperatives, companies, traders...) whenever a customer is poisoned by the safe vegetables supplied by them.

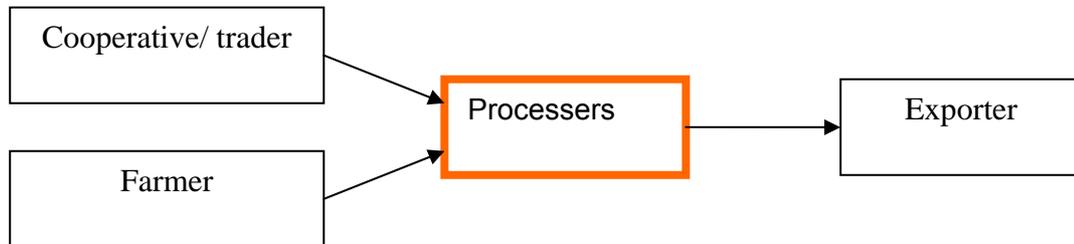
#### 4.10 Main difficulties and support required

Difficulties	Supports
<p>1. <i>Packaging, labeling:</i> the majority of products sold to retailers is not concerned with quality certification, product label, packaging, while retailers must take care of these things when selling products to consumers and it takes lots of time and also damages when doing these jobs.</p> <p>2. <i>Advertisement of safe vegetables. At retail points there's no such form of ads of safe vegetables for consumers (because no labels on products)</i></p> <p>3. <i>Prices:</i> Sale price at shops is always high because of its business requirement such as: preservation, display, location rental, consumers are not aware of quality products and corresponding prices.</p> <p>4. <i>Knowledge:</i> Most retailers are short of knowledge of the followings:</p> <ul style="list-style-type: none"> <li>+ preservation, packaging label and information for customers.</li> <li>+ hygienic safe</li> <li>+ collecting market info.</li> </ul>	<p>→ Provisions for all safe vegetables for sale must have packaging, label, origin, otherwise they should not be confirmed as safe vegetables. According to the government provisions, the responsibility of packaging, labeling shall belong to farmers, cooperatives, purchasing companies. The responsibility of retailers is to supervise the origin of products, the quality certification and naturally, they must be responsible with their customers. Therefore, announcement of these provisions should be made publicly for everybody to know.</p> <p>→ Advertise on mass media about safe vegetables and encourage to use safe vegetables with label and origin.</p> <p>→ Encourage and establish selling points of safe vegetables at markets in the city so that safe vegetable could reach and serve people at best prices (no seats taxes, no business taxes), this aspiration is also a request of Sao Viet Center, it participates in the safe vegetable plan of Ho Chi Minh city, but it could not get a good outlet, unless it has to pay high rental, as a result, cost increases, and it's difficult to sell, products have no customers, re-investment is unable....</p> <p>→ Training retailers about the benefits of selling and consuming safe vegetables, and knowledge of preservation, administration of customers and contracts. Make them understand policies and be confident in the future of safe vegetables to be sold to</p>

+ administration of customers and contract obligation.	consumers.
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**5. Processor/ Exporter** (picture 25, appx.11)

Diagram 24: Processors & their direct relative



**5.1. General characteristic**

Most of processed vegetable is reserved for export. However, export output is not much. In Ho Chi Minh city, export output occupied less than 1% (source: Department of Agriculture & Rural Development)

At present, processing vegetable is still a new field and faces many challenges. Export value of processed vegetable is much lower than processed seafood. Therefore, some processing manufactures say that this is a very difficult business field.

The following is some information about processing vegetable which we collected from the in-depth interview to Costal Fisheries Development Corporation Ho Chi Minh City – Viet Nam (refer to the list of processing companies in appx. 14)

Costal Fisheries Development Corporation Ho Chi Minh City – Viet Nam mainly export seafood. The output of exported vegetable only occupied 20% gross output. The products consist of eggplant, bitter melon, okras etc...Only a little green vegetable is processed\*

**5.2 Material & source**

The companies grow vegetable by itself or order traders or farmers to grow vegetable in Ho Chi Minh city and other provinces, such as Tay Ninh, Da Lat, western provinces of Viet Nam...

**5.3 Classifying**

After harvesting, products are transported to the processing manufacturer. Then workers begin classifying products by quality or size to meet the requirements for various products. Based on the requirement for end products, people can decide the weight of the products.

**5.4 Processing method:**

Most of the vegetables are fried, boiled, or teamed. After that, they are frozen (picture 26, 27, appx. 11)

- Eggplant: Cutting→ Frying→ Freezing→ Packing
- Okras: Steaming→ Cutting or not→ Freezing→ Packing
- Bitter melon: Boiling→ Freezing
- Chilly: Frying→ Freezing

\* At present, due to the processing technology has not yet met the export requirement, a little of green vegetable is exported.

## 5.5 Preservation & storage

After processed, Cofidec rarely stores product or only stores in short time because they processed by order.

After transporting to the manufacturer, if the manufacturer can't process products immediately, they'll store products in cold storage (from 10 – 15<sup>o</sup>)

## 5.6 Transportation

### Transporting products from garden to processing manufacturer

Vegetable is transported from garden to processing manufacture by truck (not cold). This is normally use to transport in short distance. The manufacturers often supply plastic square basket to pack vegetable. Those baskets are piled when transporting. (picture 18, appx 11)

- In some cases, the manufacturer takes care the transportation from garden to processing manufacturer by cold truck (10 – 15<sup>o</sup>)

### Transporting products from processing manufacturer to the importers

Products are transported by sea route and kept cold during the transporting time. The transporting time is about 10 days.

## 5.7 Loss

Average loss rate in harvest is about 10%. Sometimes it comes up to 50% because of bad weather. The loss rate in classifying, preliminary processing, processing is 30 % (maximum) (Source: Indepth interview to Cofidec)

## 5.8 Packing, labeling, confirmation

### Packing:

End products are packed as the requirements of customer. Commonly, the manufacturers use bag (type of 1 kg or 0.5 kg), PA & PE are used. After packed, end products are packaged by carton and then transported.

### Labeling:

At present, some Vietnamese manufactures stick their label on the products. However, most of the processed products are sticked labels of imported companies. Inspire of that, the production date & bar code are written on the bag so that people can trace products back to their source in case the products don't meet the requirement.\*

### Confirmation:

Products of Cofidec is confirmed by the Vegetal protection officer (Phyto Certificate)

## 5.9 Contract & agreement

Quality of product is stipulated before and applied for all contracts. Quantity & price will depend on the agreement of each contract.

Payment term is mainly by L/ C (Letter of Credit), the period of time from delivery to payment can be: 30, 60, 90 days depending on the agreement in the contract.

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\* Bag must be made from material which is permitted by imported countries (Source: indepth interview to Cofidec)

\*\* For example, the name of Cofidec company is written in most of documents, their products also use Japanese label. Only on the label, there is a writing "produced in Vietnam" and the bar code.

### 5.10 Interest

The interest is not high. According to Cofidec, their profit on processed vegetable is only about 5%

Difficulties	Supports
<p>Cultivating: They have met many difficulties in cultivating because of bad weather. Actually, as mentioned above in farmers section, the loss rate is very high in rainy season because vegetable easily get damaged.</p> <p>Cultivation technique is still limited, especially technique to control the abundant insecticide according to the customer's requirement.</p> <p>Customer: In fact, the importer has many strict requirements (for example Japan) about the appearance and the quality of products. Compared with the processing technique of Vietnam, the requirements of foreign countries are quite high. Therefore, most of Vietnamese companies haven't met demand, and requirement of importers (For example Japanese importers even stipulate washing a chopping – board to a standard of safe and hygienic process)</p> <p>Cost: Cost for processing is increasing day by day, especially cost for transportation. Partly due to the increase of fuel's price while the price of end product is not increased in some countries (for example: Japanese)</p> <p>Label: most of processing manufacturers in Ho Chi Minh city have not had their own trade mark yet. They use importers trade mark. In a competitive &amp; integrating world, they will easily lose their foothold in the market if they don't build and protect their trade mark.</p>	<p>As mentioned in the farmer section, the suggested solution is to supply net house to safeguard</p> <p>Supporting &amp; training cultivating technique to meet the demand of importers.</p> <p>Supporting training classes (in Viet Nam &amp; foreign countries) to train cultivating process and modern processing technology which follows international standard.</p> <p>Investing modern equipment to take place the old one to increase the yield and decrease the cost.</p> <p>In case that fuel's price is increasing, companies should offer new price. However, the price should be slightly increased to keep a competitive price.</p> <p>Building trade mark.</p> <p>Intensifying commercial promotion as well as popularizing trade mark in new market.</p>

## 6 Consumers (end-users)

Consumers of safe vegetables are not numerous, mainly through the channels of supermarkets, shops along the roads. Vegetables, roots and fruits they buy are diverse such as salad, spices, cabbage, amaranth, basella alba, savropus, water morning glory, cabbage, balsam apple ,carrot....

### 6.1 Perception and attitude of consumers about safe vegetables.

Perception of safe vegetable is restrained, mainly by feeling the appearance. The following is Ho Chi Minh consumers' comment & appraisal about the difference between safe & normal vegetable:

Table 12: Consumer's perception about safe & normal vegetab

Concept	Characteristic	Reason
Normal vegetable	smoothly green, shiny	Vegetable is sprayed so much pesticide so vegetable become verdant
	pungent smell	Due to abundant pesticide
Safe vegetable	clean, fresh but not smoothly green	Vegetable is not sprayed so much pesticide
	Without pungent smell	
	Neatly bundled and packaged	Checked and arranged carefully before selling.
	Without pest	Safeguarded by net house and trimmed carefully

As shown above, source & label are not considered as a prerequisite condition for safe vegetable. It is still unclear to distinguish safe vegetable & normal one, mainly based on feeling.

### 6.2 Buying and consuming habit

Vegetables are being bought daily. Average of each buys not much : 0.5 to 2 kg (each household)

Most of consumers buy vegetable in market so they don't care about the origin and label of products. At those place, sellers are acquainted and trusted for their products. Some consumers said that *"eat products without being poisonous or any symptoms is good enough"*. \*. Some respondents said that sellers have had categorize products (type 1, type 2) for them (market)\*\*

They are pleased with the place where they mostly frequented. Main reason is that the seller is polite, nice, heartfull, reasonable price, clean vegetables, no old vegetables, close to household, accustomed to that shop, a trustworthy and safe one.

when being questioned that they used to buy safe vegetables from Tân Phú Trung cooperative. Reason: *"Afraid of products not clean, not safe, poisonous"*, *"Want to buy guaranteed quality vegetables"* (source: FGDs).

Some customers who buy vegetable from supermarket pay attention to origin and label. Normally, some know safe vegetable of Tan Phu Trung cooperative

### 6.3 Factors which influence decision to buy:

- a) *Near house (convenient)*
- b) *seller is nice, trustworthy*
- c) *guaranteed quality products (fresh, green, look good)*
- d) *Reasonable prices*

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\**Vegetable poisoning & its symptoms are not referred by consumers. it proves that perception about the danger of unsafe vegetable is not concerned properly.*

\*\* *Type 1: vegetable is fresh, not rotten, equally bundled. Type 2: not as good as type 1.*

*When asked about the benefits when using vegetables (safe) most of consumers appraise that safe vegetable is nutritious, supply vitamin fiber, minerals ...However, as mentioned above, perception about the danger of unsafe vegetable is still not high. They just concern much about the danger after usage. However, this danger doesn't happen immediately. (Source: Axis)*

#### 5.4. Wishes and needs

Problem	Support
<p>1. Consumer's knowledge relating to safe vegetables are still limited and just centered around "poisonous" problem. Recognition of safe vegetables is just from outside look, there's not any method of evaluation.</p> <p>2. Many consumers in Ho Chi Minh City want to have clean vegetables but don't know where to get them with reasonable prices, while at some places prices for safe vegetables are fixed rather high. (30 % higher than but not sure whether it is safe or not?)</p> <p>3. At markets in Ho Chi Minh City, non-safe vegetables are displayed for sale along with safe ones, consumers could not see the difference.</p>	<p>→ Packing &amp; labeling safe vegetable to distinguish with normal one (compulsory)</p> <p>→ Safe vegetables should be publicly advertised for consumers on mass media.</p> <p>Methods to control &amp; punish false sellers. Indication of how to determine safe vegetables and responsibility of sellers in respect of quality</p> <p>→ Establishment of a distribution system of safe vegetables at markets is very important. It helps to form a network for low prices.</p>

### 7. Roles of relevant organizations

For Ho Chi Minh safe vegetable, roles of some organizations, departments, office...which is relevant with cultivation and consumption safe vegetable are very important, such as The People's Committee of the City, The Department of Agriculture & Rural Development, Vegetal Protection Office, Encouraging Agricultural Expansion, Agriculture & Forestry university....

#### 7.1 The People's Committee of the City

This committee is the highest agency that concerns and decides the development of safe vegetables in the city. The People's Committee of the City is developing a big scale plan of an area (400 ha) for raising supply of safe vegetables for the city up to 70% in 2010 (double the present quantity).

#### 7.2 The Department of Agriculture & Rural Development

A coordination to be made among the Office of Scientific Industry and Environment, Health Office and Commerce Office in the administration of " Safe Vegetables " of the City.

To cooperate with concerning agencies for planning production, training realistic planting stages for every single plant.

As a unit that manages and implements all directions of the Committee, the Department of Agriculture has established foundation, formed a system and network for growing safe

vegetables like nowadays. The Farming Encouragement Centers of the Agriculture Department have had experts who take responsibility in the establishment of value chain of safe vegetables, procedure of certifying quality of safe vegetables, evaluation and confirmation of quality of safe vegetables. Training courses and transfer of technologies and introduction of species, support with net houses, insects and diseases preventive methods... To coordinate with agencies and districts in an effort to develop production of safe vegetables. To organize consuming cooperatives, groups of safe vegetable production to handle and find outlets for farmers. To conduct advertisement (even now limited) for safe vegetables like Safe Vegetable Festival. To coordinate with other organizations such as Research Institutes and Universities to study and improve the quality of safe vegetables through proper cultivation techniques in order to raise the value chain.

### **7.3 Vegetal Protection Office**

In order to have measure to control the quality of vegetable production for circulation in the city, in 1999 – 2001, the City Vegetal Protection Office had coordinated with the Faculty of Post Crop to proceed researching the topic

“Bio-Method for fast analysis of excess of insecticide”. The results of this topic research have been applied by the Vegetal Protection Office in establishing a fast analysis laboratory to serve the administration of safe vegetables of the Agriculture Department. This Office is also the place where certification of safe vegetable is made.

### **7.4 Commerce Department**

The Commerce Department is responsible for administration of circulation and distribution of safe vegetables and business units. However, the administration of business units and support of these units to establish a trader network for the city are still restrained.

**7.5 Institutes, university:** Post Crop Research, Farming Scientific and Technological Study of Ho Chi Minh City and Farming Industry Transfer Center of HCMC are those that have had functional support in cultivation techniques, cropping and post crop to help the development of safe vegetable cultivation in the city. However, most of these supports have been mainly aimed at the stage cropping, the stage of post crop is still open. Those supports focus on fruit and rice much more than vegetable because of small quantity, lack of capital and human resource. Therefore, the help of international organization is very necessary.

### **7.6 Districts’ Committees**

Are those that manage, plan, encourage, develop and coordinate with Agriculture Department for the whole system.

### **7. Supports required from functioning agencies.**

- To get support and consult of standard of safe vegetables, especially support for enterprises dealing with vegetables and fruits in confirming of safe vegetables according international value chain. (in general)
- Support for establishment of safe vegetable standard close to standard of regional countries and the world to use as legal bases for enterprises and business to follow.
- Support farmers and enterprises with training courses for production of vegetables according to GAP in order to shorten the distance of city vegetables in incarnating into those of the region.
- Introduction of models and methods of managing quality of safe vegetables – e.g. control of poisonous excess of insect spray, heavy minerals, growth moderate substance... ( from other countries)
- Methods of pushing production and consumption and trade proceeding, Building and advertising trademarks in and out of the country.

#### IV. ANALYSIS OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

The following is the analysis table to summarize strength, weaknesses, opportunities, and threats of Ho Chi Minh safe vegetable:

##### 1. STRENGTHS, WEAKNESSES

	<b>STRENGTHS,</b>	<b>WEAKNESSES</b>
<b>Seed</b>	<ul style="list-style-type: none"> <li>- Seed of Ho Chi Minh vegetable is mainly old seed (familiar seed) so farmers have experiences in cultivating &amp; protecting vegetable from pest &amp; disease</li> </ul>	<ul style="list-style-type: none"> <li>- Variety of vegetable is not diversified (mainly green vegetable, mushroom..)</li> <li>- Old seed (not like Da Lat vegetable which consists of many new seeds of safe vegetable, such as: violet cabbage, green cauliflower etc ...).</li> </ul>
<b>Soil, climate</b>	<ul style="list-style-type: none"> <li>- Climate in Ho Chi Minh city is relatively stable with two separate season, rarely has disaster. All those conditions are very ideal to improve safe agriculture.</li> <li>- The People's Committee of the City has planned the area where grow safe vegetable.</li> </ul>	<ul style="list-style-type: none"> <li>- The city soil has transitional characteristic of south-east VietNam and Mekong Delta, so the soil is not rich.</li> <li>- Ho Chi Minh city is an industrial &amp; populous one, so the city soil is suffered from polluted environment, such as: industrial waste, traffic, populated areas, hospitals, cemeteries ...</li> <li>- Due to urbanization, cultivating surface is narrowed year by year</li> <li>- Mechanization in vegetable cultivation is not high, modern farming equipment is not enough. Sometimes, farmers work the soil perfunctorily so the quality of next crop is not good.</li> <li>- There are many farmers who have not participated in cooperative yet, the cultivation is thus sparse. Therefore, applications of new technology, mechanization, collecting products, post harvest technique and transportation are still very difficult</li> </ul>
<b>Quality of product</b>		<ul style="list-style-type: none"> <li>- In general, cultivation technique is still not high. Application of new cultivation technique is not synchronously so quality is not the same.</li> <li>- Farmers maintain old cultivation habit and usage of so much vegetal protection medicine to speed up vegetable's growing in order to get large benefit, especially in holiday. It is the reason why some checked vegetable samples have surplus pesticide (source 14, appx. 10)</li> <li>- Quality of Ho Chi Minh safe vegetable only meet part of local demand. At present, it has not met strict international requirements.</li> </ul>

<p style="text-align: center;"><b>Price</b></p>	<p>Collecting price of safe vegetable is higher than normal one. That'll bring high benefit to growers.</p>	<ul style="list-style-type: none"> <li>- Cooperative, production group can't find out market for all products so a considerable amount of safe vegetable (about 20 %) is sold in wet market with the same price of normal vegetable. This is one of the disadvantages for farmers.</li> <li>- On the other hand, customers are still confused as they are unable to identify safe vegetable and its suitable price. In fact, any vegetable product which is labeled " safe vegetable" will be immediately increased in price (from 20 – 50%) without any guarantee about their safety.</li> </ul>
<p style="text-align: center;"><b>Quantity</b></p>		<ul style="list-style-type: none"> <li>- Output of Ho Chi Minh vegetable is still low. It has only met 30 % demand of Ho Chi Minh city. A large amount of consumed vegetable in Ho Chi Minh city is normal vegetable or from other provinces.</li> <li>- Safe vegetable is mainly distributed for high – grade consumers, such as: restaurant, hotel, supermarket. Common people rarely buy safe vegetable.</li> <li>- Output of processed/ exported vegetable is not considerable. (~1%)</li> </ul>
<p style="text-align: center;"><b>Post harvest</b></p>	<p>Cooperative model is organized relatively well with concentrated preliminary processing place and transporting by truck so people can decrease the loss rate of post harvest.</p>	<ul style="list-style-type: none"> <li>- Facilities for preliminarily processing, packaging, storing are still poor, sometimes unhygienic.</li> <li>- Packing and labeling are not applied well and widely.</li> <li>- Lack of warehouse to store (excluding supermarkets, big enterprises) so every works, such as preliminarily processing, packing and transporting... have to be done fast even at night in order to ensure the products will be transported to buyers on time.</li> <li>- Vegetable variety is poor. Also processing technique is still not good.</li> <li>- Lack of managers who have knowledge and experiences.</li> </ul>

<b>Relation in the value chain</b>	<p>Build up connecting model among farmer, production group, cooperative, enterprise and relevant office.</p> <p>Those relationship has begun to be built on legal base. These are credit and memo (between cooperative and farmer) or paper contract (between Cooperative and enterprise).</p>	<ul style="list-style-type: none"> <li>- Members in the value chain have not been aware of their duties for the product quality yet, especially in packing and labeling. Therefore the implementation is still not synchronously</li> <li>- Although paper contract begins to be applied, it's still not applied widely.</li> <li>- Information exchange in the value chain is still limited (market information, marketing products information, feedbacks from consumers etc...). Communication is still poor.</li> </ul>
<b>Concern of organizations</b>	<p>Many offices and organizations concern to improve the production of safe vegetable. Especially, there are program which connect 4 members (farmer, administrator, scientist, businessman)</p> <ul style="list-style-type: none"> <li>- The People's Committee of the City planned growing area quite well.</li> <li>- Farmers get many helps, such as: cultivating technology, finding the market for safe vegetable... Especially Vegetal Protection Office helped to supply many training class for farmers. Also this office supervised and checked carefully.</li> </ul>	<ul style="list-style-type: none"> <li>- Concern, support, control have not been implemented synchronously and strictly, especially in confirmation of safe vegetable.</li> <li>- Market research &amp; marketing products have not been intensified yet</li> <li>- Supporting capital is still limited.</li> </ul>

## 2. OPPORTUNITIES, THREATS

	<b>OPPORTUNITIES</b>	<b>THREATS</b>
<b>Demand</b>	<ul style="list-style-type: none"> <li>- Demand of consumption is increasing day by day, especially in urban area=&gt; opportunity to increase output.</li> <li>- Demand of high quality is increasing and customers accept that quality with higher price=&gt; Nhu cầu về chất lượng sản phẩm cao đi đôi với giá cao hơn được ngày càng nhiều người tiêu dùng chấp nhận =&gt; opportunity to increase benefit if product quality is ensured.</li> <li>- Demand of material which meet export requirements is also increasing (Processing manufacturers).</li> </ul>	<p>With present size and production ability, Ho Chi Minh safe vegetable has not yet met local demand, let alone export demand.</p>

<p style="text-align: center;"><b>Product</b></p>	<p>- With the help of research institutes, offices and government and non government organizations, safe vegetable is a potential product which has opportunity to enlarge the cultivating surface, diversify variety and increase yield.</p>	<p>- Planning urban area in Ho Chi Minh city is rather complicated. Land for cultivating safe vegetable is not much. Although planned before, the implementation is not easy.</p> <p>- Image of safe vegetable has not been popularized. Awareness about safe vegetable is still not high so it affect on consumption degree (Especially, consumers of average income rarely buy safe vegetable).</p>
<p style="text-align: center;"><b>Export</b></p>	<p>Export market is very large, especially when exporting to Asian countries.</p>	<p>- Quality of processing is not high because cultivating and processing technique still can't meet international requirements. Therefore, we can't compete with other countries.</p> <p>- Most of processing manufactures lack of material because quantity of safe vegetable is not much.</p> <p>- Cost for processing is increasing, mainly because price of soil is increasing.</p> <p>- Vietnamese vegetable has to suffer from high tax when exporting</p>
<p style="text-align: center;"><b>Trade mark</b></p>	<p>- Some labels of safe vegetable in Ho Chi Minh city are known by consumers, such as: Tan Phu Trung safe vegetable, Bay Yet safe mushroom.... Other cooperatives and production group are also on their way to build up their own trade mark in order to be known in local market and to look for chances to export.</p> <p>- At a first step, the commercial promotion program of Ho Chi Minh city cooperating with Sai Gon Tiep Thi newspaper is currently supporting 20 enterprises in building trade mark. It is a good opportunity for cooperatives, enterprises to participate in this program.</p>	<p><u>Awareness about the importance of building trade mark is still limited, partly because some enterprises have not tried their best.</u></p> <p>- Building trade mark tardily will make it difficulty to directly compete with other trade marks in the market, especially when exporting.</p>

## V. CONCLUSIONS & RECOMMENDATIONS.

Developing safe agriculture in general and developing safe vegetable in particular are big problems which has to be solved by Vietnamese science & technology. Therefore, growing safe vegetable is not only a necessary work of farmers in Ho Chi Minh city but also a common concern of our country. At present, safe vegetables in Ho Chi Minh City have certain favourable facts as compared to other place like:

1. Suburban farmers have had long tradition of growing vegetables (Hoc Mon, Cu Chi...)
2. It has been supported by leading agencies of the city, institutes, universities... in development of safe vegetables.
3. Safe vegetables plan has created significant change in increasing benefits for farmers, earth shall be kept for farming production, farmers then get obliged deeper to paddy fields.
4. Ho Chi Minh City is a large market for large amount of safe vegetables in the region. It also has the highest GDP => demand on safe vegetable is very high
5. There are a lot of processing manufacturers in general & vegetable processing manufacturers in particular in Ho Chi Minh city and its surrounding regions. Material for processing is transported from everywhere. Also, it is easy to export products from Ho Chi Minh city via different transports: by air, by sea or by land...
6. It is also a place to exchange goods between the East & West south of Vietnam, as well as between Central of Viet Nam & High region .

However, with this survey we shall point out some difficulties relating to safe vegetables in Ho Chi Minh City:

1. Safe vegetable production is still on small scale, not enough to meet demand, so its cost is still high while quality is not stable and not competitive.
2. Application of mechanization in cultivation, protecting planting areas, organic vegetal planting is still a model that's not widespread.
3. Preparation, preservation and packaging design of safe vegetable products are still restrained (except supermarkets, big enterprises. Cooperatives and farmers don't have warehouse to store) so the loss rate in those stages affect much on benefit of members in the value chain. As a result, the final price is also affected.
4. A lot of safe vegetables are sold in to market without label or source so it cause a confusion between safe and unsafe one. As a result, it causes difficulties for farmers and confusion for consumers.
5. Now, safe vegetables have only been examined of the remains of insect sprays from organic phosphorus base. Carbamate by 2 methods giving fast examination of insecticide base and other diseases, bases of heavy metals and excess of nitrate, if any, shall be conducted with high cost and take long time to have results, so it's not encourageable for enterprises to do by themselves. Methods of fast examination are only qualitative methods that could not be used as facts for treatment. Moreover, farmers are only recommended if their products have surplus pesticide, they are not suffered from strict punishment.
6. Information exchange in the value chain is still limited so it does influence on the effectiveness of the value chain. Present quality & the loss rate in each stage in the value chain is the most obvious effect

From the above analysis, we want to give some recommendations as follows:

### 1. Organize & support

- GTZ should co-ordinate with The People's Committee of the City to intensify the organization of concentrated growing area with large size according to proposed program and plan.
- Responsible offices should organize to test and confirm safe vegetable region frequently and seriously with high technique.
- Support to grow safe vegetable as regional and international standard, as well as support cooperatives and production units which meet the standard to build up trade mark.
- Metro should co-ordinate with Commercial department, Agricultural & rural development department re-organize distribution system of national and private enterprises under the supervision of 1 representative organization.
  - Agricultural & rural development department, Encouraging agricultural expansion, research institute should frequently organize training class, perform modern technique model to help members in the value chain contact with those techniques which are introduced by researchers, Encouraging agricultural expansion, and international organizations (see the training section below). Also those organizations should organize advanced model so that other productions units can learn mutually.
  - GTZ and Metro should support to invite foreign expert to help those production units in Viet Nam.
  - GTZ, Metro and other organizations should support members in the value chain technique to reserve products in normal condition, especially develop processed products, pack, package and transport products as proper process so that loss rate in each stage is decreased
- Besides, GTZ, Metro should help farmers, traders and officers of encouraging agricultural expansion to test the market information, or connect internet etc... Those helps are very necessary in this information age.
- GTZ should co-ordinate with market research companies, research institutes, and other organizations do some researchs to find out consumer's liking to diversify local products and widen export market for Ho Chi Minh safe vegetable.
- Finally, with the supports of those above organizations, GTZ và Metro should co-ordinate with relevant offices to conduct commercial promotion programs as well as build up & popularize trade mark in and out of the country for some safe vegetable products, such as: mushroom, mustard, water morning glory...

## 2. Training

- GTZ and Metro should organize training class, as well as consultant course about standards for safe vegetable (see more in training section of Dalat vegetable)
- Co-ordinating with Sofri to support farmers and enterprises in learning new knowledge and growing vegetable according to GAP 's standard.
- Co-ordinating with Vegetal Protection Office to organize training class to introduce and popularize model & methods to manage safe vegetable's quality management \_ For example: methods to test surplus poisonous substance, such as: pestticide, substance to regulate growth....
- Metro should organize short & long term training class in the local about preservation, processing & packaging technique...which will meet Metro and other markets' requirements. (Europe, America, Japan...)
- Metro should co-ordinate with authority, such as Commercial department, , Agricultural & Rural Development department and relevant organizations to widely popularize forms of contract in farm product distribution.

Please refer to Chapter 4 (Value chain of Dalat vegetable) to see more about training direction.

**Appendix 9: Tp.HCM – List of indepth interview**

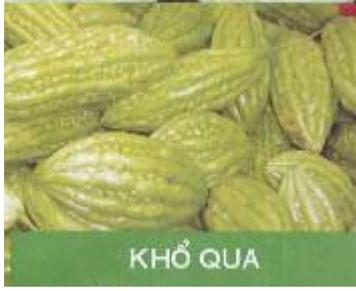
No	Full name	Role in the value chain	Position	Address / Agency	Contact number
1	Nguyễn Phước Trung	Authority	Manager of Agricultural & rural development department	Agricultural & rural development department	0989757079
2	Chị Cúc	Authority	Officer of Agricultural & rural development department	Agricultural & rural development department	8297580
3	Anh Ký	Authority	Technique manager	Encouraging agricultural expansion	0903395616
4	Anh Lâm	Authority	Manager	Post harvest technology institute	0903936342
5	Anh Quang	Authority		Post harvest technology institute	8481316
6	Võ Mai	Authority	Chairman	Vietnamese fruit association	0903739662
7	Nguyễn Quốc Toàn	Authority	Chairman	Tân Phú Trung Cooperarive	8922569
8	Nguyễn Hoàng	Collector		Ấp Đình, Tân Phú Trung commune , Củ Chi district	8922580
9	Nguyễn Quốc Toàn	Collector		Tân Phú Trung commune , Củ Chi district	0908218501
10	Lương Việt Thắng	Wholesaler	Director	Vegetable & Fruit Company	9141541
11	Trần Vinh Quang	Wholesaler	Manager of investment & developing business department	Vegetable & Fruit Company	0903948043
12	Minh Hoàng		Manager of planning department	Costal Fisheries Development Corporation Ho Chi Minh City – Viet nam,	8480780
13	Vũ Thị Thúy	Retailer		Ấp Đình, , Củ Chi district	7960297
14	Nguyễn Thị Thơm	Retailer		Ấp Đình, , Củ Chi district	
15	Kim Linh	Retailer		45 Phan Chu Trinh street, Bến Thành market	8246157
16	Trần Thị Kim Dung	Retailer		365 Phạm Văn Chí street, Q6	9670268
17	Nguyễn Thị Nguyệt	Retailer		Ấp Đình, , Củ Chi district	
18	Võ Thị Ngọc Diệu	Supermarket		Maximart 3/2 supermarket	0908548249
19	Chị Định	Supermarket		Coopmart Thắng Lợi	0903645471
20	Nguyễn Minh Tuấn	Supermarket		Cora An Lạc supermarket	8770684
21	Phan Thị Nhuận	Consumer		Ấp Đình, Củ Chi district	

22	Nguyễn Thị Đệ	Consumer		Ấp Đình, Củ Chi district	7960302
23	Nguyễn Thị Hương	Consumer		Ấp Đình, Củ Chi district	8922116
24	Đỗ Thị Minh	Consumer		Ấp Đình, Củ Chi district	8922736
25	Nguyễn Thị Kim Mai	Consumer		Ấp Đình, Củ Chi district	8922906
26	Vũ Thông	Farmer		Ấp Đình, Củ Chi district	7960297
27	Nguyễn Trọng Trường	Farmer		Ấp Đình, Củ Chi district	7961682
28	Nguyễn Đăng Cường	Farmer		Ấp Đình, Củ Chi district	
29	Đỗ Thị Truyền	Farmer		Ấp Đình, Củ Chi district	7960981
30	Bùi Thị Quyên	Farmer		Ấp Đình, Củ Chi district	
31	Phạm Văn Hồng	Farmer		Cây Đa, Củ Chi district	8922792
32	Phạm Văn Dũng	Farmer		Cây Đa, Củ Chi district	
33	Nguyễn Phát	Farmer		Cây Đa, Củ Chi district	7960302
34	Phạm Thị Thanh Diệu	Farmer		Bến Đò, Củ Chi district	
35	Trần Thị Phú	Farmer		Bến Đò, Củ Chi district	

## Appendix 10: Documents for reference

No	Article title	Report/Magazine./Website	Date
1	<i>Appplying mechanization in growing safe vegetable</i>	<i>Sài Gòn Giải Phóng newspaper</i>	26-07-05
2	<i>Safe vegetable is still a worry</i>	<a href="http://www.anqiang.gov.vn">http://www.anqiang.gov.vn</a>	
3	<i>Data of Satistical Office - Hồ Chí Minh city</i>	<a href="http://www.pso.hochiminhcity.gov.vn">http://www.pso.hochiminhcity.gov.vn</a>	
4	<i>Conducting the plan of Agriculture- Forestry and Salt production in 2002 and plan in 2003</i>	<i>From storing center of Sài Gòn Times</i>	
5	<i>Producing safe vegetable toward industrial direction.</i>	<i>SaiGon economy newspaper</i>	
6	<i>Area, population, geography and climate of Hồ Chí Minh city</i>	<a href="http://www.vietshare.com">http://www.vietsshare.com</a>	
7	<i>Report on the situation of safe vegetable production in Hồ Chí Minh city</i>	<i>Agricultural &amp; rural development department</i>	2005
8	<i>Temporary stipulation about safe vegetable production (according to the 67 resolution – 1998/QĐ – BNN- KHCN date 28 – 4-1998)</i>	<i>Agricultural &amp; rural development ministry</i>	
9	<i>Supplying contract between Metro Cash &amp; Carry Việt Nam LTD and Tan Phu Trung safe vegetable cooperative.</i>	<i>Tan Phu Trung safe vegetable cooperative.</i>	12-04-04
10	<i>Supplying Contract for fruit vegetable anf food between Saigon Vegfruco and Binh Triệu trading enterprise.</i>	<i>Saigon Vegfruco</i>	11-04-05
11	<i>Preliminary report for developing safe vegetable program from 2001 to 2003</i>	<i>HCM Agricultural &amp; rural development department</i>	2003
12	<i>Producing and consuming safe vegetable in HCM</i>	<i>Report of scientific forum about producing and processing clean food.</i>	2003
13	<i>Investigating production and distribution situation of safe vegetable in Hóc Môn and Củ Chi district, Hồ Chí Minh city</i>	<i>Report of scientific forum about producing and processing clean food.</i>	2003
14	<i>Safe vegetable becomes dirtiest</i>	<a href="http://vnexpress">http://vnexpress</a>	

**Appendix 11: Picture**

<p>Hồ Chí Minh safe vegetable</p>	 <p>1. Vegetable for edible leave.</p>	 <p>2. Vegetable for edible bulk</p>	 <p>3. Hóc Môn mushroom</p>
<p>Growing &amp; harvest</p>	 <p>4. Net house</p>	 <p>5. House used for growing safe mushroom</p>	 <p>6. Harvesting</p>
<p>Preliminary treatment &amp; Classifying</p>	 <p>7. Preliminary processing at garden</p>	 <p>8. Preliminary processing at cooperative</p>	 <p>9. Preliminary processing at retail outlet</p>
<p>Packing, labeling</p>	 <p>10. Label for Tân Phú Trung safevegetable</p>	 <p>11. Packing at cooperative's place</p>	 <p>12. Packing (variety of vegetable)</p>

<p>Storage</p>	 <p>13. Storing vegetable at Tân Phú Trung cooperative</p>	 <p>14. Cool storage at saupermarket</p>	 <p>15. Storing Hoc Mon potato</p>
<p>Transportation</p>	 <p>16. Farmer transports product to collecting place (by motobyke)</p>	 <p>17. Farmer transports product to collecting place (by tricycle)</p>	 <p>18. Transporting products to buying place (by slight truck)</p>
<p>Các điểm thu gom</p>	 <p>19. Tân Phú Trung cooperative</p>	 <p>20. Collecting place</p>	 <p>21. Collecting place</p>
<p>Trading place</p>	 <p>22. Retail/ wholesale place</p>	 <p>23. Retail outlet of Sao Viet company</p>	 <p>24. Retail outlet at wet market</p>
<p>Processing</p>	 <p>25. Processing frozen vegetable</p>	 <p>26. Processed product (dried French bean)</p>	 <p>27. Processed product (fried pumpkin)</p>

**APPENDIX 12: LIST OF UNITS WHO DECLARE QUALITY OF SAFE VEGETABLE/ PROCESSING MANUFACTURERS IN HOCHIMINGCITY**

No	Name	Address	Phone number
1	Sinh Thành, biology - forestry joint business company	17/14 KP 3, Hiệp Bình Phước ward, Thủ Đức district	8969431
2	HCM fruit and vegetable company	50-52 Nguyễn Thái Học street, district.1	9141372
3	Bảo Long limited company, manufacturing- trading – supplying service	143/18 Xô Viết Nghệ Tĩnh street, ward 25 , .BT district	5113156
4	Ngọc Liên Giang company, manufacturing- trading safe food	14 Tái Thiết street, ward 11, Q.Tân Bình	9713040
5	Trang Trại company	16/2/1 Đặng Văn Ngữ, ward 10, PN district	8442900
6	Thuận Toàn commercial cooperative	l 15 Tân Sơn Nhì hostel, ward 14, TB district	8496218
7	Sao Việt center –An Giang, vegetable protection company	174 Trần Hưng Đạo street, .Nguyễn Cư Trinh ward, district1	8379445
8	Hưng Phát	90A/17A Âu Dương Lân street , ward 6, district 8	8517489
9	Hoàng Giang , trade –service limited company	269 Khánh Hội street, ward 5, district 4	8264889
10	Đặng Nguyên, fruit and vegetable limited company	D4 Ung Văn Khiêm street, ward 25, Q.BT	5150243
11	Hiệp Thành Agricultural cooperative	82A/1 Nguyễn Ảnh Thủ street, P. Hiệp Thành ward, district12	7170131
12	Ba Rôm limited company (receive & deliver goods)	6 B Đồng Na street, ward .2, TB district	9080387
13	IMEXCO company – export agricultural food company – supplying vegetable & fruit, Vegefoods	220 Nguyễn Biểu street, district 5	9235420
14	An Thịnh Phát limited company	100/14 Trần Hưng Đạo street, Phạm Ngũ Lão ward, district1	8369143-9203410
15	Triều Dương limited company, manufacturing- trading company	653/2 Lò Gốm street, ward .9, district.6	7508825
16	VF, trading fruit & vegetable	4/4 Quang Trung street, ward 10,.Gò Vấp district	
17	Kim Khánh limited company, processing aquatic product	D3/7/1 Tân Tạo residential zone,.Tân Tạo ward,.Bình Tân district	7507182
18	Vinh Trang private company	29/33 Phan Đình Phùng street, ward 17, Tân Bình district	4086044
19	Bách Sơn limited company	E3A7 Sông Thao street, ward 2, TBình district	8155174
20	Tân Trang Trại limited company	744/13 Nguyễn Kiệm street, ward 4, Phú Nhuận district	8477892
21	Tân Bảo Lộc limited company, manufacturing & trading food	20/304B Phan Huy Ích street, ward 12,.Gò Vấp district	4364857
22	Mầm Xanh limited company	B43 CC 239 CMT8 street, ward 4, district.3	8341186
23	Hạnh Dung company	53 số 4 street, ward .4, district4	9411040
24	Hùng Sương limited company, manufacturing- trading –	33/10B Phạm Văn Chiêu street, ward 12, GV district	4364931

	supplying service		
25	Chân Thành limited company	75/30A quarter 4, Bình Hưng Hòa ward, Bình Tân district	9716928
26	Tân Thiên Hà limited company	1/21 Nguyễn Sứ street, Tân Quý ward, Tân Phú district	4081200
27	Kim Xuân Quang, limited company	305/2 Tô Ngọc Vân street, Thanh Xuân ward, district.12	7160669
28	Lusun Việt nam company	4/5, hương Lộ 80B, Ấp Đông, Thới tam Thôn commune, Hóc Môn district	7179168
29	Cofidec, Costal Fisheries Development Corporation	30 Đặng Tất street, district 1, HCM city	8480780
30	AGRIMEXCO, export- import company	176 Hai Bà Trưng street, district 1	8244518
31	Tân Bình joint stock company	1/1 Trường Chinh street – Tân Bình district	8497166
32	Mai Xun fruit - vegetable- food limited company	219 Ngô Quyền street - ward 6 –district 10, Hồ Chí Minh city	8916149
33	VINA PHÁT private company.	58 – Trương Đình Hội street – ward 16, district 8, HCM city	848 – 8767687