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VEGETABLE MARKETING IN VIENTIANE (LAO P.D.R.)

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November 2004

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Foreword

This work takes place within the framework of the regional AVRDC-CIRAD project Sustainable Development of Peri-urban Agriculture in South-east Asia (Susper) project. It is the first outcome of a continuous team work between Department of Agriculture, Division of Planning of Ministry of Agriculture and Forestry of Laos (under the supervision of Khamtanh Thadavong) and CIRAD (Paule Moustier)

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SUMMARY

Overall objective

The main objective of research on vegetable marketing in Laos is to help harmonize vegetable production with the market demand in terms of quantity, quality, and price.

Review of available data

First a review of existing data was carried out, especially the JICA and FAO studies on food marketing in Laos. The studies point out the importance of Vientiane plain for fruits and vegetables in addition to Boloven Plateau (Champassak province) which mostly provides cabbage and potato. The three major food markets are: Tong Kan Kham, That Luang and Kua Dim; they operate both as wholesale and retail markets. Market traders usually combine a variety of functions and specialized wholesalers are few.

Objective of market survey

Two surveys were organised to gain additional information. The first one, investigation of market flows and chains (activity 1) aims at appraising how the market is organised spatially and in terms of functions and to quantify the supply from the different districts/villages and imports. The second one, appraisal of traders' strategies, aims at : (i) finding out the structure of the market (competition) and coordination relationships among the different actors ; (ii) comparing the different origins (peri-urban, rural, imports) in terms of price, quality, and availability of commodities ; (iii) identifying advantages and constraints of actors including access to information.

Method of market survey

The surveys took place in Tong Kan Kham, That Luang and Kua Dim markets. For the investigation of market flows and chains (activity 1), around one-third of market agents were interviewed, accounting for 92 people. The survey took place only once, in June, but data was collected on the variations during the year. Activity 2 took place in August on a sample of 50 traders. In the two surveys, the sample includes the different stakeholders present in markets (retailers, wholesalers, assemblers, producers).

Main results

Among the selected vegetables, the following are subject to imports: Chinese kale; round and olive tomato; big Chinese mustard; cucumber, while the others (pakchoi¹, small Chinese mustard, lettuce, yard long bean, cherry tomato) only originate from Lao production (see Table 2). The vegetables subject to imports correspond to varieties that are difficult to produce during the rainy season. In June 2002, that is the beginning of the rainy season, imports represented 22% of quantities transacted for Chinese kale, round tomato and cucumber; 15% for olive tomato; 2% for big Chinese mustard. On the whole, when taking the 9 vegetables, imports represent only 8% of total quantities transacted.

¹ Pakchoi can also be termed as choysum.

Most leafy vegetables originate from Vientiane municipality, less than 30 kilometres from the city center, the biggest supplier being Hatsayphong (around 60% of the flows of leafy vegetables considered in the survey). On the whole, more than 80% of leafy-vegetables originate from less than 30 kilometres from the city centre. Hatsayphong is the main supplier of tomato, while Saixetha is the main supplier of cucumber.

Decrease in the number of traders selling vegetables occurs from June to September, it is also the time of imports. The imports of tomato and Chinese kale start in April and end in December, maximum imports happening from June to August.

Despite the short distance between farms and markets, the marketing chains are characterised by a certain complexity, the combination between wholesale and retail, collection and wholesale, being frequent: more than half the traders combine different functions. The typical chain involves farmers, collectors, wholesalers and retailers. More than 65% of quantities traded involve more than one intermediary between farmers and retailers, even for a perishable vegetable like water convolvulus. The specialisation of wholesale and retail stages is more frequent for imported tomato than for local tomato. The frequent overlapping of functions may be explained by the absence of a specific location for wholesale marketing which takes place at the same places than retail transactions, and also by the small volumes transacted (less than 200kg/day for wholesalers and retailers) and the modes of transport (tuktuk is dominant).

The relationships between suppliers and buyers combine regular relationships with a small number of suppliers and occasional relationships with variable suppliers. Marketing margins are quite small (between 10 and 40%). The market can be considered as competitive yet the characteristics of the marketing chains and the market places make the access to market information quite difficult.

When comparing Lao and Thai products, traders declare the following advantages for local products: taste, alleged reputation for food safety; and for the imported products: availability and appearance; as for the prices they are similar or slightly lower for local products (by 2 to 12%).

These results show that the development of local production of tomato, Chinese kale, cucumber and big Chinese mustard in the rainy season is a major strategy for bringing additional income opportunities for farmers and traders, and decrease consumer prices. This implies farmers' training in terms of pesticide and variety use, as well as new technologies for off-season production (including tomato grafting).

The comparative advantage of Thailand for producing in the rainy season has to be assessed by further research, as well as the ways of promoting the vegetable safety of Lao products if it is confirmed as higher than Thai vegetables.

I Objectives

The objectives of the second component of SUSPER project, called *Market development of peri-urban food commodities*, are to provide a more accurate picture of the functional and spatial organisation of vegetable markets, to help harmonise peri-urban production with urban consumption in terms of quality, quantity and regularity, and to determine how information can be efficiently spread among the actors of the market in order to reach as many people as possible (e.g. find out when to spread it, where and through which means).

First we will present the state of information on food marketing in Laos available at the moment of the surveys. Then we will present the survey methodology and main results.

II State of the arts on food marketing in Laos

Studies on food marketing in Laos have been conducted by Japanese cooperation (JICA) in 2000-2001, FAO in 2001-2002, and by SATEC/Agrisud/MAF in 2002; and also in the context of an EU funded project in 1997-1999 (Potutan et al, 1999).

The Agrisud report provides some data on vegetable consumption, thanks to a survey of 500 households. The population of Vientiane was estimated at 625650 people in 2002, growing at 3% per year, including 450 000 people in Vientiane city (the average household size is 6). Three groups of households have been established according to their food expenses. Households whose food expenses are less than 1 USD per day amount to 83% of total and mostly consume vegetables traditionally produced in Lao, including cucumber, water convolvulus and eggplant (see Table 1).

Table 1 – Patterns of vegetable consumption in Vientiane

	Poor households	Average households	Wealthy households
Food expenses	<10 000 Kip (1USD)	10 000 - 30 500 K (1-3 USD)	> 30 500 K (3 USD)
% of households	83%	15%	2%
Vegetables consumed (by order of importance)	Harvest vegetables, bamboo shoots, cucumber, water convolvulus, eggplant	Cucumber, water convolvulus, eggplant, tomato	Cucumber, tomato, cabbage, Chinese kale, lettuce

Source: data from SATEC/ Agrisud/ MAF, 2002.

The consumption of vegetables was estimated at 149 g/day, including 68 g of fruit-vegetables and 49 g of leafy vegetables (which makes a total of 54 942 T per year in Vientiane municipality). Self-consumption of vegetables represents 2% of total consumption in the urban districts and 60% in the rural districts.

The consumers interviewed by Agrisud express their preference for local vegetables versus imported ones, especially because of their taste; the demand for natural and safe vegetables is also common. The restaurants which target the foreign clientele (tourists representing the equivalent of around 385 permanent residents) are mostly supplied by market wholesalers, and

express demand for freshness and vegetable regularity (while at the moment vegetable prices increase in the rainy season).

Among 100 consumers interviewed in 1999, 90% declared that they were eating vegetables everyday (Potutan et al, 1999). The first criterion considered when buying vegetables is freshness (for 80% of respondents). The majority of consumers declare preferring buying insecticide-free vegetables with slight damages rather than non infested treated vegetables.

Studies by JICA and FAO, which have been summarised in Thadavong and Sisombath (2002), provide information about origin of food products: Vientiane plain for fruits and vegetables, Savannakhet for rice, Boloven plateau and foothills for the supply of cabbage, potato, chayote, pineapple, durian, Xiengkhuang for dried chilli and garlic, Luang Prabang for pineapple and orange.

Vientiane Municipality covers both the urban area and surrounding rural areas, mostly lowland. The province has the second highest population after Savannakhet. Although the total land area is small, crop production is very significant. Rice production in the rainy season is the third largest and in the dry season the second largest. Production of vegetables is the second highest, after Champassak (Boloven Plateau). Vientiane municipality is an area of very dynamic agricultural development, thanks to the proximity of the major urban markets of the country, with relatively high prices and the development of road and irrigation infrastructure. A large variety of vegetables are grown. The most productive districts are Hatsayphong and Sikhottabong, bordering the Mekong river. Xaisetha village has an area of intensive vegetable production on paddy fields, in the dry season. The main crops are cucumber and long beans. Farmers use electric pumps to irrigate from shallow wells (Ministry of agriculture and forestry, 2002).

Most perishable vegetables and fruits are produced close to the major towns and there is little or no trade outside a radius of about 100 km around the towns (MAF, 2002, p.34).

In Vientiane municipality, the rainy season lasts from May to October (most rains in August and September). It is the time of rice production. Vegetables are mostly grown during the dry season, from November to March (see Kennavong et al, forthcoming).

The main markets of Vientiane are Tong Kan Kham, That Luang and Kua Din. All three have a similar way of operating. Their main function is retail selling of crops, meat and fish. Wholesale operations take place early in the morning (3-4 a.m.) at the transport terminal, the vehicle loads the products quickly, it is then bought up by market retailers shortly after and it is replaced by retailing or loaded on to smaller vehicles to other markets. Semi-wholesalers of bulky vegetables and fruits like water melon, banana, cabbage and sugar cane simply use an area on the ground, covered with straw and matting, on the outside of the market or along neighbouring streets.

Among retailers, there are permanent/professional, semi-permanent and non-permanent traders. Marketing chains are usually short except in the case of supply from Boloven Plateau and the import of Thai fruit, which involves real wholesalers in operation.

Marketing chains seem chaotic with a lot of combination between functions, but it enables flexibility and the provision of fresh food at low cost. Due to the small size of the market and the different geographical directions of food trade, it is noted by FAO that a big and specialized wholesale markets would certainly add extra transport costs. It is rather recommended to upgrade the existing markets paving, drainage and roof shelter.

Some results on the origin of food products have been collected SATEC-Agrisud-MAF report but the methodology is not detailed. The report states that the imports represent 39% for tomato, 35% for lettuce, 35% for Chinese cabbage, 42% for carrot, 35% for cabbage, 37% for chayotte and 7% for Chinese kale, but it is not clear how these figures were obtained as the market survey was conducted in June only, and traders were not asked about quantities traded. As regards the data on vegetable marketing chains, results are not specified by different types of vegetables: in particular it mentions the role of large-scale wholesaler-collectors who are owners

of their vehicles and trade more than 500 kg of produce per day, but this may be limited to little perishable vegetables like cabbage from Boloven Plateau.

This state of the arts has enabled us to identify the areas where additional information is required for the purpose of the project:

- 1) The information collected by FAO and SATEC/Agrisud/MAF is not specific enough in terms of location of supply areas for the different vegetables. In the project, we need to know the districts supplying Vientiane markets for different vegetables in order to better target production areas where technical improvements will be set up.
- 2) We need more information on the variations of supply during the year.
- 3) We need more information on the comparative advantages of the different supply areas for Vientiane market, in particular as relates to local and Thai supply in terms of availability, quality, price.
- 4) Little is known on the internal patterns of organisation in the commodity chains: stakeholders' access to information, relationships between suppliers and vendors, in order to propose improved patterns of coordination among marketing stakeholders if proved necessary.

III Research protocols

Market research has been organised in two different and complementary activities: investigation of market flows and chains (rapid market surveys) and appraisal of traders' strategies and performance (in-depth interviews). The research protocols are summarised below.

A) Protocol for activity 1 (investigation of market flows and chains)

1. Objectives

The objectives of the survey are outlined below:

- To appraise how the market is organised spatially and in terms of functions
- To quantify the supply from the different districts/villages and imports
- To quantify the importance of the different marketing chains

2. Survey strategy:

• Place of interviews

The interviews took place in the three following markets which are the most important for Vientiane vegetable supply: Thongkhankham, Thatluang, Kuadin. These markets function as wholesale and retail markets (wholesale and retail activities are conducted at different times of the day and different places).

• Frequency

The survey was due to be conducted during three times to take account of seasonality, in April; August and October 2002. In fact there were delays in the launching of the first survey

which was eventually conducted in June, and data was collected on the variations during the year. It is recommended that other surveys are conducted at other times of the year, in particular between September and December (beginning of dry season), and in April-May (end of dry season).

• Choice of products

Nine commodities were selected: Pakchoy, Chinese mustard (small - width of stem less than 1 cm and big - width of stem more than 4 cm), lettuce, cucumber, yard long bean, tomato (round, olive and cherry), eggplant, water convolvulus, Chinese kale. This selection was made from the following criteria: importance in consumption, in peri-urban production, and, in the case of tomato, cucumber and Chinese mustard, possible imports from Thailand.

• Time of interviews

The interviews were conducted in the early morning (5-6 a.m.) and during day-time. They lasted twenty to thirty minutes.

• Target population

The population targeted by the survey is made of the collectors, assemblers and wholesalers who are selling their products in the early morning (night market), as well as retailers of the selected commodities.

• Sampling

A preliminary census was made to list the names and count the total number of traders selling the nine selected vegetables. The size of the sample was determined by taking around one-third of the total. Traders were selected in a random way by taking one every three trader on the list (see Table 2). As will be presented in the section on results, the distinction between collectors, wholesalers and retailers is not obvious as they commonly combine several functions at the same time.

Table 2 – Sample for survey on origin

	Thongkhankham	Kuadin	Thatluang	Total
Total number	112	96	65	273
Sample size	38	32	22	92
- wholesalers and collectors	14	11	11	36
- retailers	24	21	11	56

• Questionnaire

The questionnaire, mainly made of closed questions, is enclosed in Appendix. It is similar to the one used in Hanoi and Phnom Penh, and has been tested in Lao language. It mostly relates to the following topics: nature and functions of traders, of their suppliers and customers; origin of products; quantities sold; variation of the business in the year.

• Method for data processing

The data was processed under SPSS 11.5.

B) Protocol for Activity 2 (interviews on traders' strategies)

1. Objectives

The objectives of the survey are listed below:

- To find out the structure of the market (competition) and coordination relationships among the different actors
- To compare the different origins (peri-urban, rural, imports) in terms of price, quality, and availability of commodities
- To identify advantages and constraints of actors including access to information
- To evaluate traders' incomes and marketing margins

2. Survey strategy

• Place of interviews

The interviews took place in Thongkhankham, Thatluang and Kuadin.

• Time of interviews

The interviews took place in early morning and during day time, and lasted between 40 and 60 minutes. They were conducted in August.

• Target population

The population targeted by the survey is made of producers, collectors, assemblers, wholesalers and retailers, selling in the selected markets

• Sample

We made some rational sampling by selecting around half actors selling wholesale and half retailers selling wholesale, but the distinction is not easy as actors commonly combine functions. In the end, we interviewed 50 actors, including 27 retailers, and 23 actors acting as collectors and wholesalers (and sometimes retailers or producers).

• Questionnaire

The questionnaire, enclosed in appendix, comprises open and closed questions. The questionnaire has four separate parts. The first part is on the marketing behavior namely: salient feature of the trader, list of marketed products, place of origin of the product, place of purchase, time to get the supply, time to sell the supplies, and means of transport used. The second part is on the trade organization and information: viz. information on regular suppliers, problems with the suppliers, payments made to suppliers and customers, regular customers, problem with customers, cooperation and discussion with other traders, and information about commodity prices. The third part deals with comparisons among different origins. The fourth part is on the economic results.

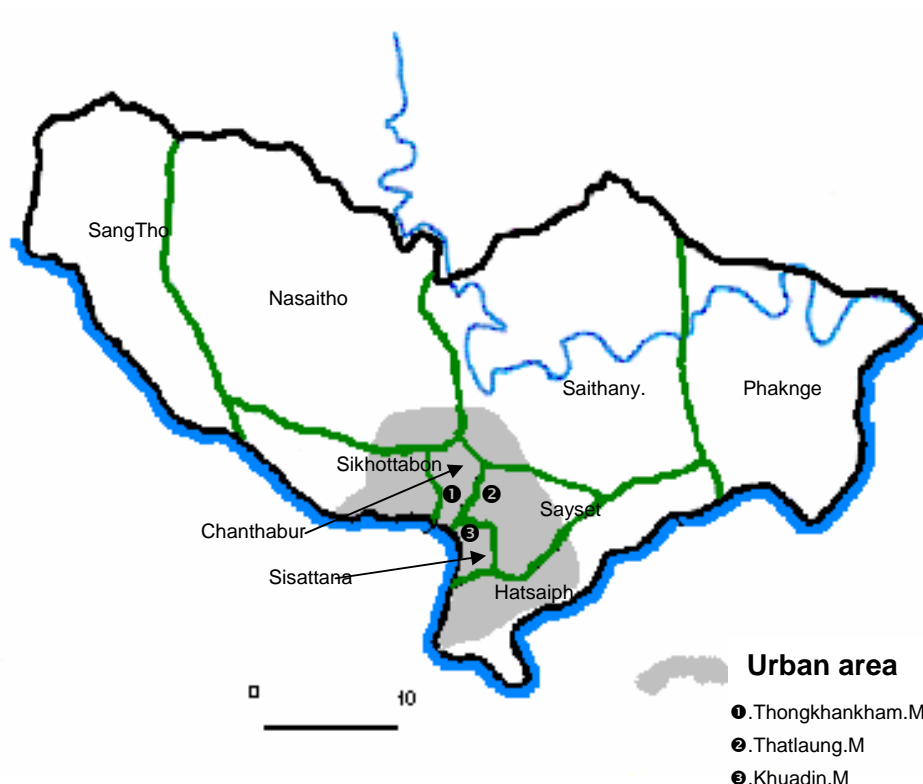
• Processing

The survey was processed under SPSS and also by hand for the open questions.

IV Basic information on researched markets

The three investigated markets combine wholesale and retail trade. The wholesale starts at night until early morning and retailing takes place from 6 a.m. to 6 p.m. The location of the three markets is indicated in Figure 1 – Location of the three markets.

Figure 1 – Location of the three markets



A) Khuadin market

Located in the south-west of the city, around 1 km from the centre, Khuadin market is close to the morning market bus station, which is suitable for unloading and loading commodities. It is divided into three sections: (1) clothes and household products; (2) food retailing (vegetables, meat, fish) and (3) food wholesaling. There are about 90 food retailing stalls.

Khuadin market is the main food wholesale market and the most important place for the distribution of agricultural produces to the city and also to the rest of the country.

Vegetable wholesale uses small trucks (1.5-ton) or pick-ups parked outside the market place. From 8p.m. to midnight, most commodities sold are from Vientiane peri-urban area. After this time, main produces come from rural areas in Vientiane and Bolikhamxay provinces. The wholesale market officially opens at 3 a.m. and trucks are allowed to enter the market after this hour, until 6 a.m.

According to FAO study (MAF, 2002), Khuadin market is much less developed than the other two markets. The whole market is muddy or dusty according to the season and very congested, both in the access roads and inside the market area. This market is the first destination for farmers and collectors from Sikhottabong District of Vientiane municipality and from Vientiane Province.

B) Thongkhankham market

Located in the north of the city, 0, 5 km far from the central Vientiane municipality, Thongkhankham market benefits from an easy access by road. The vegetable area is divided into a wholesale and a retail area. Vegetable wholesale takes place from 4 am to 6 am, at proximity of the vehicles. After 6 a.m., retailing takes place until 6 p.m.

Thong Khan Kham market is the best laid-out market in Vientiane. The customers of this part of the town are relatively prosperous and the products are usually of better quality than in the other markets and have slightly higher prices (MAF, 2002).

C) Thatluang market.

Located in the west, about 3 km far from the central Vientiane municipality, Thatluang market is near the bus station which leads to the south. The selling area is paved. Wholesale takes place from 4 a m to 8 a m, when vehicles are allowed to enter the market. Retailing takes place from 7 a m to 6 p m. Thatluang has the biggest turnover of rice and its location is convenient for the delivery of products grown in the south of the country, including cabbage (MAF, 2002).

V Origin of products

A) Local production versus imports

Among the selected vegetables, the following are subject to imports: Chinese kale; round and olive tomato; big Chinese mustard; cucumber, while the others (pakchoi, small Chinese mustard, lettuce, yard long bean) only originate from Lao production (see Table 3). The vegetables subject to imports correspond to varieties that are difficult to produce during the rainy season.

According to interviews with farmers and traders, tomato is imported from Thailand because of Lao farmers' problems in growing tomato when temperatures are high. The supplying areas in Thailand are distant of some kilometres only, opposite the river. Some farmers say that Thai farmers use seeds which are more adapted to high temperatures than the Lao ones. The comparative advantages of Thai vegetable production in the rainy season need further investigation.

Table 3 - Local and imported vegetables

Entirely local vegetables	Vegetables subject to imports
Pakchoi	Chinese kale
Small Chinese mustard	Round tomato
Lettuce	Olive tomato
Yard long bean	Cucumber
	Big Chinese mustard

When considering the quantities sold by traders, we are left with the following figures on the percentage of imports (see Table 4): 22% for Chinese kale, round tomato and cucumber; 15% for olive tomato; 2% for big Chinese mustard. The figures are similar than those obtained from the percentage of traders selling products from different sources, except in the case of tomato for which the percentages are 10 points less: the average quantity traded by wholesaler-retailers is higher for local tomato than for imported tomato (35kg versus 29 kg for olive tomato; 40 kg versus 35 kg for round tomato), which may reflect the fact that imported products are taken on an irregular basis, on the occasion of trips to Thailand. On the whole, when taking the 9 vegetables, imports represent only 8% of total quantities transacted at the time of survey.

Table 4 - Quantities of local versus imported vegetables

- sum of total quantities per day sold by all interviewed traders -

	Quantity (kg/day)	Percentage
Chinese kale		
<i>Local</i>	886	78%
<i>Imported</i>	246	22%
Total	1132	
Round tomato		
<i>Local</i>	2822	78%
<i>Imported</i>	799	22%
Total	3621	
Olive tomato		
<i>Local</i>	2768	85%

<i>Imported</i>	474	15%
Total	3242	
Cucumber		
<i>Local</i>	3082	80%
<i>Imported</i>	750	22%
Total	3832	
Big Chinese mustard		
<i>Local</i>	1944	98%
<i>Imported</i>	42	2%
Total	1986	
Pakchoy	3549	
Lettuce	2482	
Yard long bean	1732	
Eggplant	1830	
Total	28881	
Local	26568	92%
Imported	2313	8%

B) Origin of vegetables by district

We present now the details of the origin of vegetables in terms of district location. To calculate the percentage of the different districts in the vegetable supply, we used the percentage of traders selling products from different districts rather than percentage of quantities due to the following reason: the traders declared the total purchased quantities, sometimes originating from different villages, so it was not possible to split the quantities of local vegetables into the different districts of origin. Besides, we found that the quantities sold by traders were not significantly different between districts for a given trader.

1. Origin of leafy-vegetables

Most leafy vegetables originate from Vientiane municipality, less than 30 kilometres from the city center, the biggest supplier being Hatsayphong, which represents around 60% of the flows of the leafy vegetables taken as a group (70% for pakchoi and big Chinese mustard, 80% for small Chinese mustard, 40% for lettuce and water convolvulus) – see Table 5 to Table 11 and Figure 2 to Figure 9). Saythani, Saysetta and Sissatanak are also important for the supply of leafy vegetables (17%, 13% and 7% respectively). Other districts of Vientiane municipality (Chantabury, Sikhottabong) and Vientiane Plain (Thulakhom) play a more minor role in the supply.

Only Chinese kale and big Chinese mustard are supplied by Thailand for a small part (25% for Chinese kale and 5% for Chinese mustard), because of the problems farmers experience in cultivating them at times of high temperatures and rainfall. Pakchoi, small Chinese mustard, lettuce and water convolvulus are entirely supplied by domestic production.

On the whole, more than 80% of leafy-vegetables originate from less than 30 kilometres from the city center.

Table 5 – Origin of leafy-vegetables

District	Frequency	%
<i>Vientiane municipality</i>		
Nasaithong	3	0.5
Sikhotabong	3	0.5
Sisattanack	40	6.6
Saysettha	80	13.2
Saythany	103	17.1
Hatsaiphong	351	58.1
Chanthabury	9	1.5
<i>Vientiane province</i>		
Thulakhom	3	0.5
<i>Thailand</i>	12	2.0

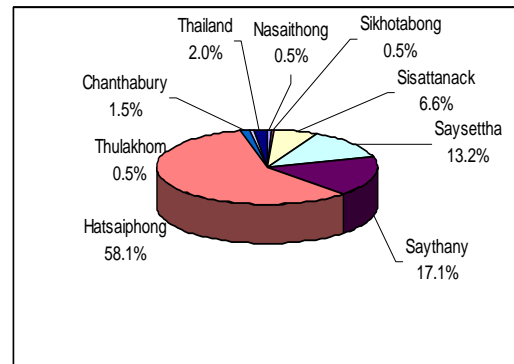
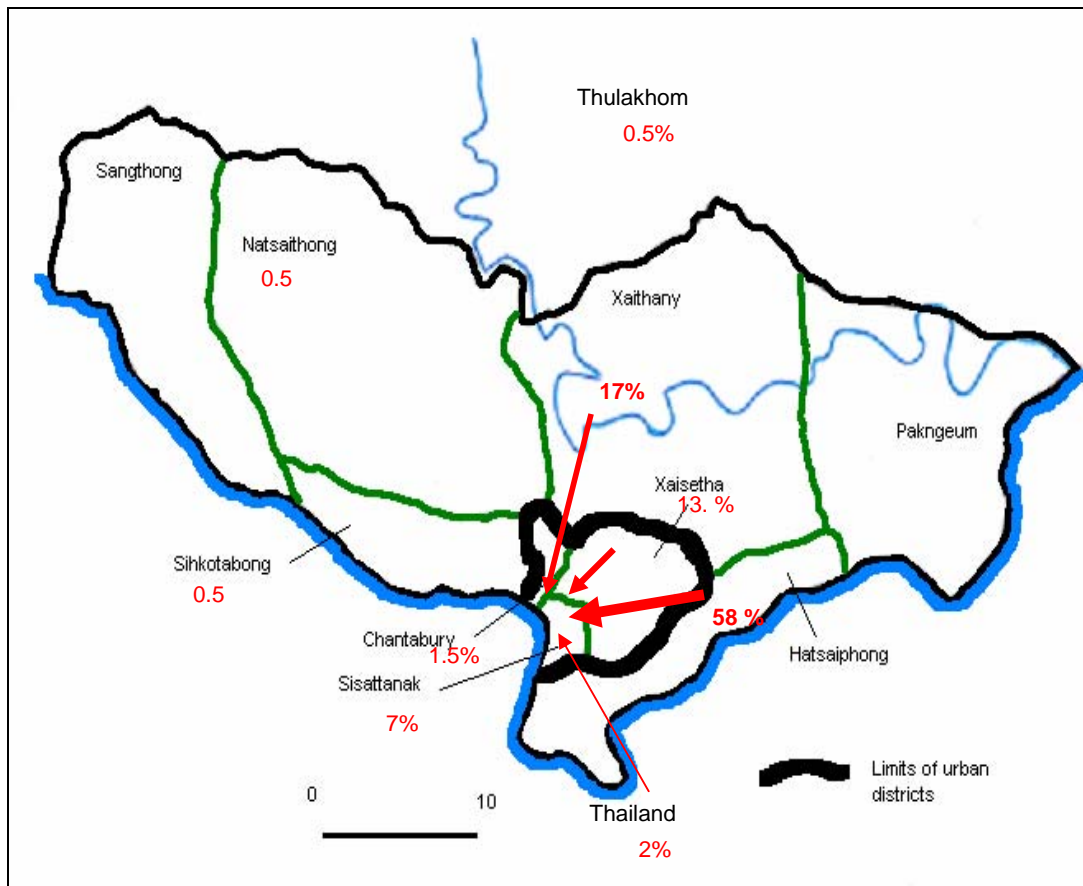
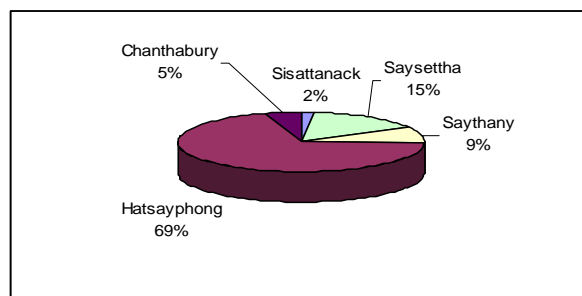
Figure 2 – Origin of leafy vegetables**Figure 3-Origin of leafy vegetables in Vientiane market (June 2002)**

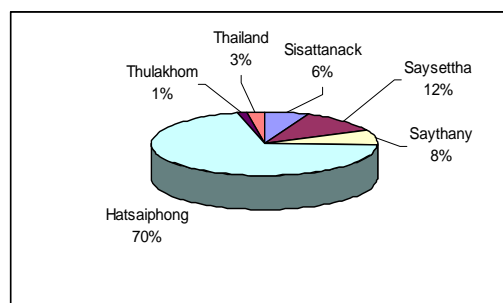
Table 6 – Origin of pakchoi in June

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	3	2
Saysettha	26	15
Saythany	15	9
Hatsayphong	119	70
Chanthabury	8	5
Total	171	100

- All percentages in the tables relate to the percentage of traders supplied by the different districts-

Figure 4-Origin of pakchoi**Table 7 – Origin of big Chinese mustard**

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	5	6
Saysettha	9	12
Saythany	6	8
Hatsaiphong	55	71
Thulakhom	1	1
<i>Thailand</i>	2	3
Total	78	100

Figure 5 - Origin of big Chinese mustard**Table 8 – Origin of small Chinese mustard in June**

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	7	8
Saysettha	3	3
Saythany	6	7
Hatsayphong	73	79
Chanthabury	2	2
<i>Vientiane province</i>		
Thulakhom	1	1
Total	92	100

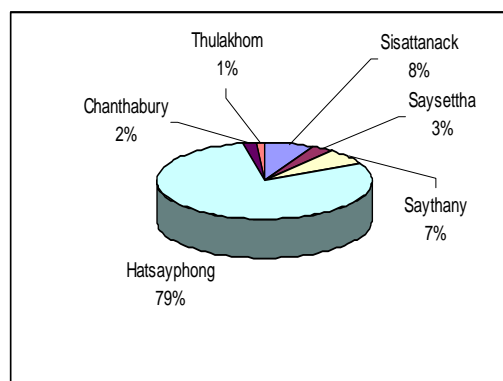
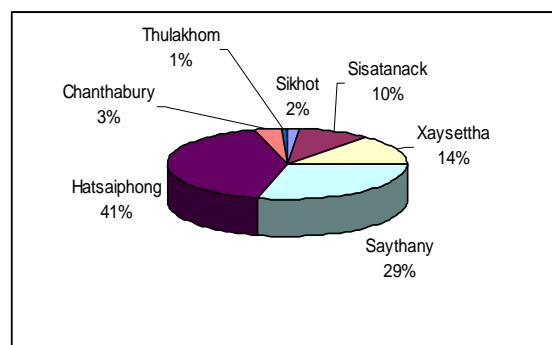
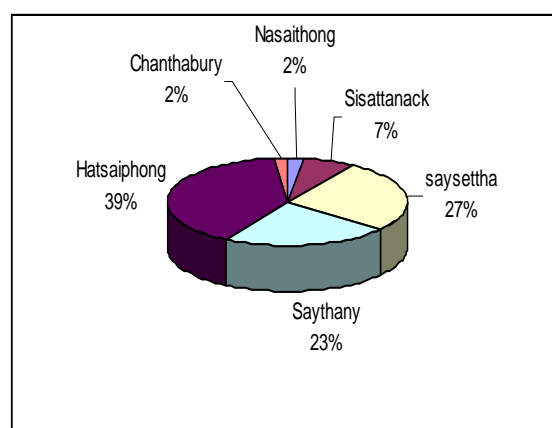
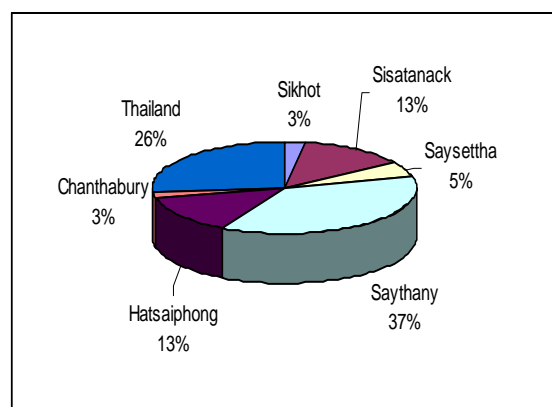
Figure 6 – Origin of small Chinese mustard in June

Table 9 – Origin of water convolvulus in June

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	11	10
Saysettha	16	14
Saythany	33	29
Hatsayphong	48	42
Chanthabury	4	3
Sikottabong	2	2
<i>Vientiane province</i>		
Thulakhom	1	1
Total	115	100

Figure 7 - Origin of water convolvulus in June**Figure 8 – Origin of lettuce in June****Table10 – Origin of lettuce**

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	9	7,0
Saysettha	34	26,6
Saythany	29	22,7
Hatsayphong	51	39.8
Chanthabury	2	1,6
Natsaitong	3	2,3
<i>Vientiane province</i>		
Thulakhom	1	1
Total	92	100

Figure 9 – Origin of Chinese kale in June**Table 11 - Origin of Chinese kale in June**

District	Frequency	%
<i>Vientiane municipality</i>		
Sisattanak	5	13,2
Saysettha	2	5,3
Saythany	14	36,8
Hatsayphong	5	13.2
Chanthabury	1	2,6
Sikottabong	1	2,6
<i>Thailand</i>	10	26.3
Total	38	100

2. Origin of fruit-vegetables

While yard long bean and eggplant are entirely supplied domestically, tomato and cucumber are partly supplied by Thailand (see Figure 13 to Figure 16 and Table 12 to Table 14). Hatsayphong is the main supplier of tomato (54% of traders for cherry tomato, 60% for olive tomato, 45% for round tomato). Ban Hom village is the source of cherry tomato for 40% of traders. In Sikhotabong, Ban Nongda villages (including Ban May, Hoay hom, Tat thong, Nongda) are important suppliers of round tomato.

Table 12 – Origin of olive tomato

District	Frequency	%
<i>Vientiane municipality</i>		
Sikhotabong	8	7
Sisatanak	2	2
Hatsaiphong	72	62
<i>Vientiane Province</i>		
Thulakhom	2	2
Thaphabath	2	2
<i>Thailand</i>	30	26
Total	116	100

Figure 10 – Origin of olive tomato

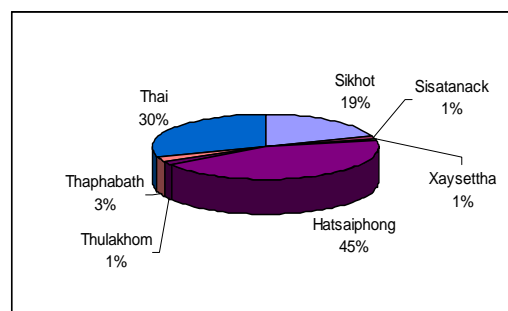


Table 13 – Origin of round tomato in June

District	Frequency	%
<i>Vientiane municipality</i>		
Sikhotabong	26	19
Sisatanak	2	1
Xaysettha	1	1
Hatsaiphong	59	44
<i>Vientiane Province</i>		
Thulakhom	2	1
Thaphabath	4	3
<i>Thailand</i>	40	30
Total	134	100

Figure 11– Origin of round tomato in June

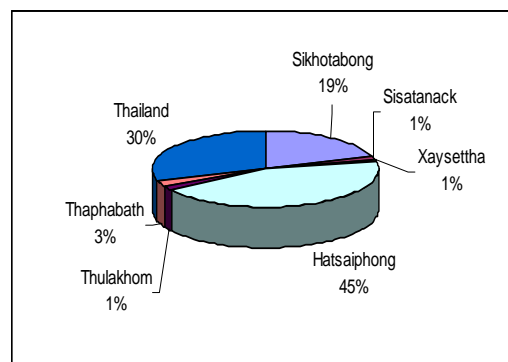
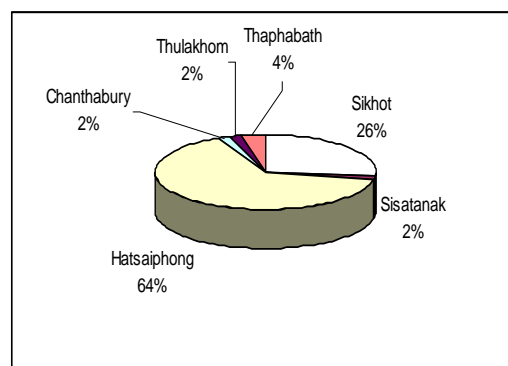


Table 14 – Origin of cherry tomato

District	Frequency	%
<i>Vientiane municipality</i>		
Sikhotabong	15	26
Sisatanak	1	2
Hatsaiphong	37	65
Chanthabury	1	2
<i>Vientiane province</i>		
Thulakhom	1	2
Thaphabath	2	4
Total	57	100

Figure 12– Origin of cherry tomato



For cucumber, Saysetha is the most important supplying district (44% of traders), especially Ban Xiengda village (around 34%).

Supply from Thailand represents 30% of tomato traders (olive and round – not cherry, which is only supplied by domestic sources) and 20% for cucumber.

Figure 13 – Origin of round tomato in Vientiane market (June 2002)

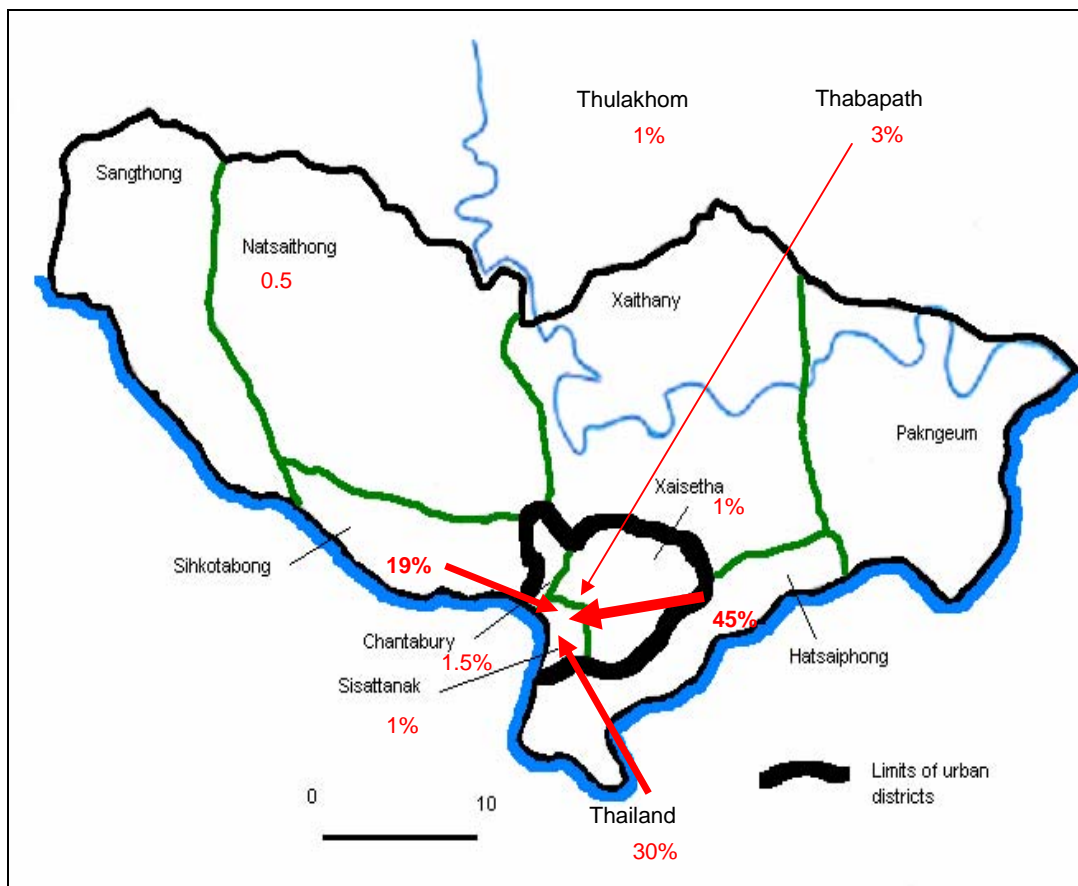
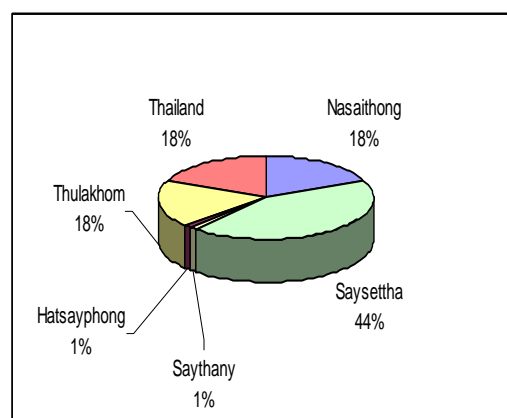


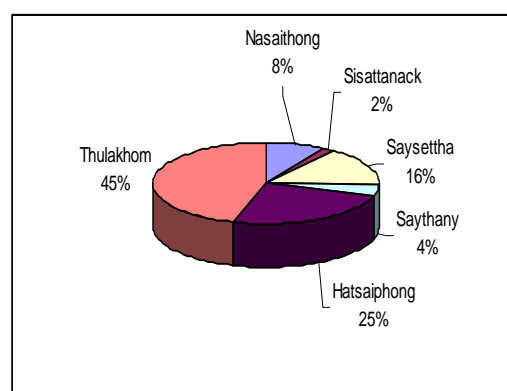
Table 12 – Origin of cucumber

District	Frequency	%
<i>Vientiane municipality</i>		
Nasaithong	16	18
Saysettha	38	43
Saythany	1	1
Hatsayphong	1	1
<i>Vientiane province</i>		
Thulakhom	16	18
Thailand	16	18
Total	88	100

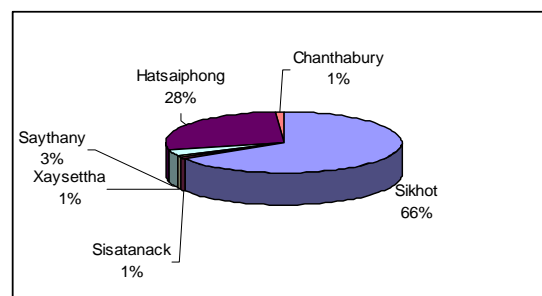
Source: Susper

Figure 14– Origin of cucumber**Table 13 – Origin of long bean**

District	Frequency	%
<i>Vientiane municipality</i>		
Nasaithong	9	8,3
Sisattanack	2	1,9
Saysettha	17	15,7
Saythany	4	3,7
Hatsaiphong	27	25,0
<i>Vientiane Province</i>		
Thulakhom	49	45,4
Total	108	100

Figure 15 – Origin of long bean**Table 14– Origin of eggplant**

District	Frequency	%
<i>Vientiane municipality</i>		
Sikhotabong	61	66
Sisatanack	1	1
Xaysettha	1	1
Saythany	3	3
Hatsaiphong	26	28
Chanthabury	1	1
Total	93	100

Figure 16– Origin of eggplant

VI Time variation of market supply

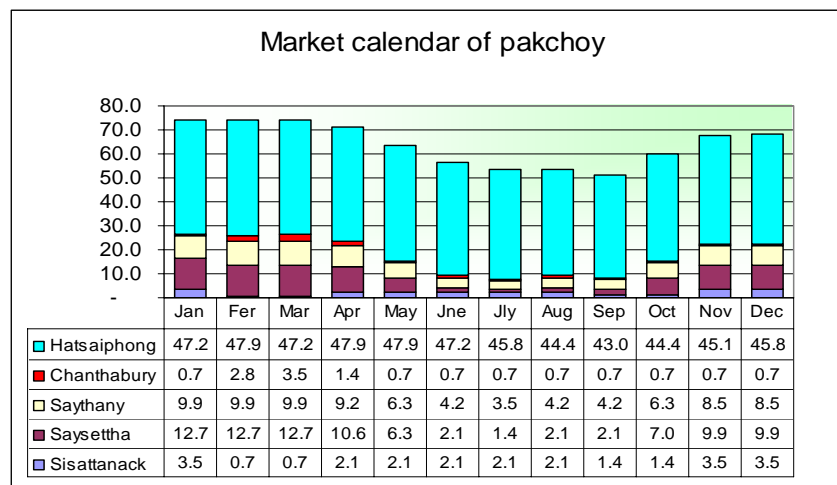
The percentage of the total number of interviewed traders (in Activity 1) who sell the vegetable from the indicated origin during the indicated month has been taken as an indicator of the share of the different origins in the vegetable supply at the different times of the year.

A) Pakchoy

Pakchoy supply is found all year round (mostly from Hatsayfong district), but more pakchoy supply is observed from January to March and it gradually decreases from March to October, then increases again during the November-December period (see Figure 17).

Figure 17 - Variations in pakchoi supply

- Percentages of the total number of interviewed traders (in Activity 1) who sell the vegetable from the indicated origin during the indicated month-

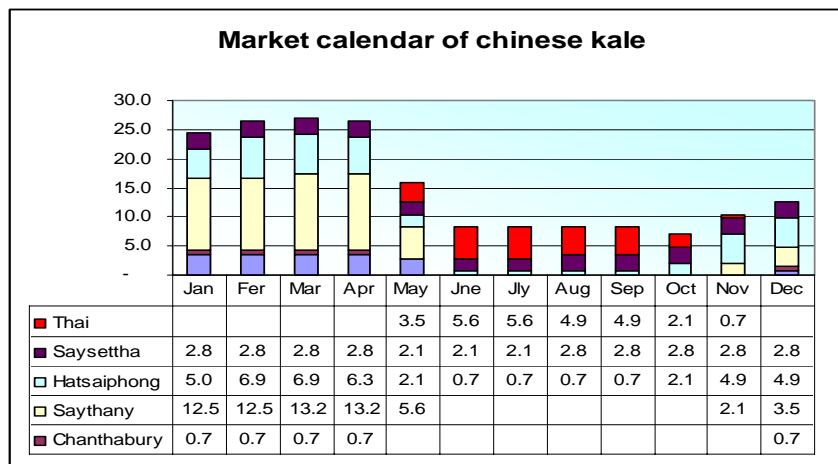


B) Chinese kale

Local Chinese kale is available only from December to April, especially during February-March (see Figure 18). Imported Chinese kale is found in the rainy season from May to November, especially in June-July period when it represents more than 60% of the Chinese kale sold in the market.

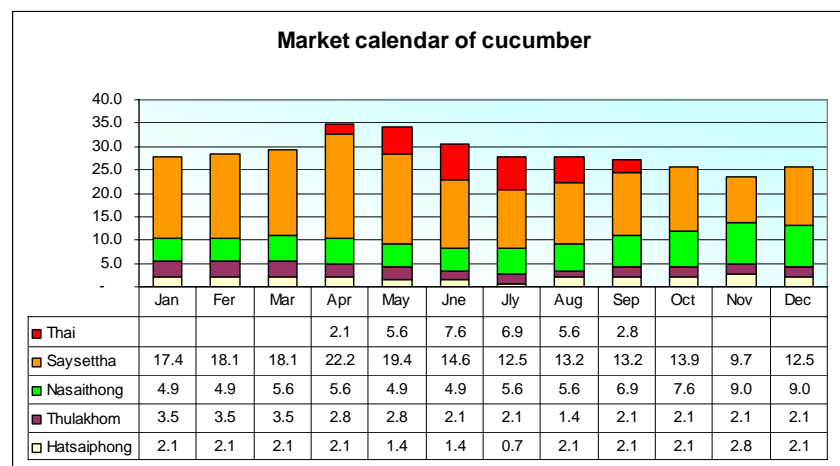
Figure 18– Variations in Chinese kale supply

Percentages of the total number of interviewed traders (in Activity 1) who sell the vegetable from the indicated origin during the indicated month-



C) Cucumber

There is little monthly variation in the supply of local cucumber supply. Yet more of local cucumber is found in April and less in July (see Figure 19). In April, there is cucumber imported from Thailand, (about 6%). April is the month of annual traditional events when the demand for cucumber is the highest, which explains the growth of local and imported cucumber in the market. Cucumber imports are found from April to September, mostly in June-July (around 24%).

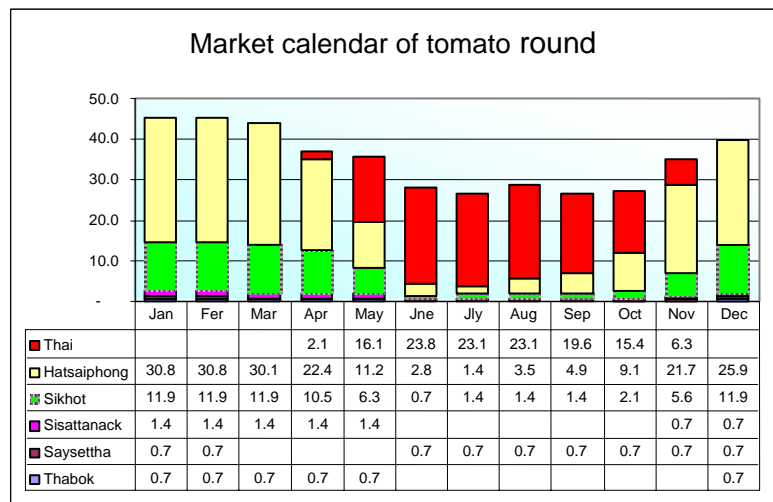
Figure 19 – Variations in cucumber supply

D) Round tomato

Round tomato is available all year round especially during the dry season in December, January, February and March (see Figure 20). Then tomato supply gradually declines during the rainy season: in July 7% of traders sell local tomato while 23% sell imported tomato. Imported tomato is observed from April to November, especially from May to October (about 87% of traders), because Lao have difficulties in growing tomato during these months.

Figure 20– Variations in round tomato supply

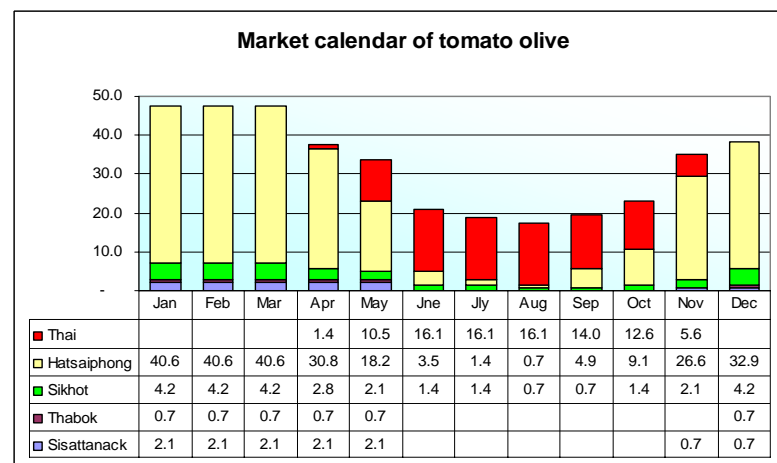
- Percentages of the total number of interviewed traders (in Activity 1) who sell the vegetable from the indicated origin during the indicated month-



According to traders' declarations during the stakeholder meeting organised in December 2002 (Lecoq, 2003), the supply of local products in April-May is lower than in June-September; as these declarations are in contradiction with the results of the traders' survey presented above, they should be checked by a survey on tomato origin and quantities in April-May².

E) Olive tomato

Olive tomato supply is not much different from round tomato. More imported olive tomato is found from June to October because of more rainfall and around 92% of traders sell imported tomato in August (see Figure 21).

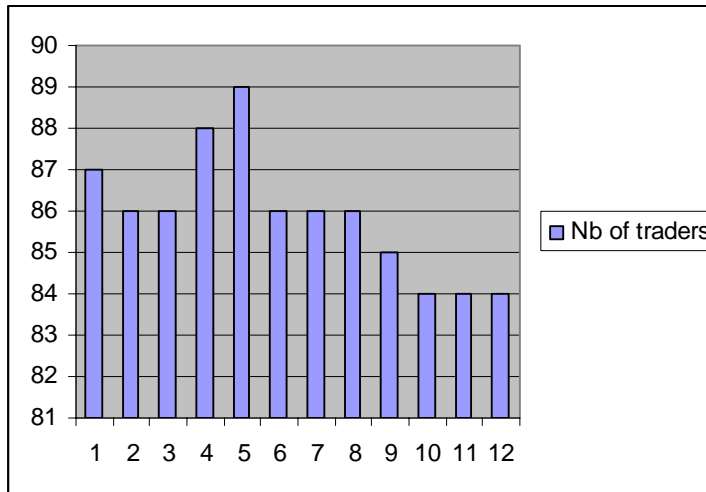
Figure 21 -Variations in olive tomato supply

² The difference between the traders' declaration at the time of the survey, i.e., early June, (30% selling tomato from Thailand) and the declarations related to the month of June (around 80% selling tomato from Thailand) may relate to the survey taking place at the beginning of the month when tomato imports are not as high as the rest of the month.

F) Other vegetables

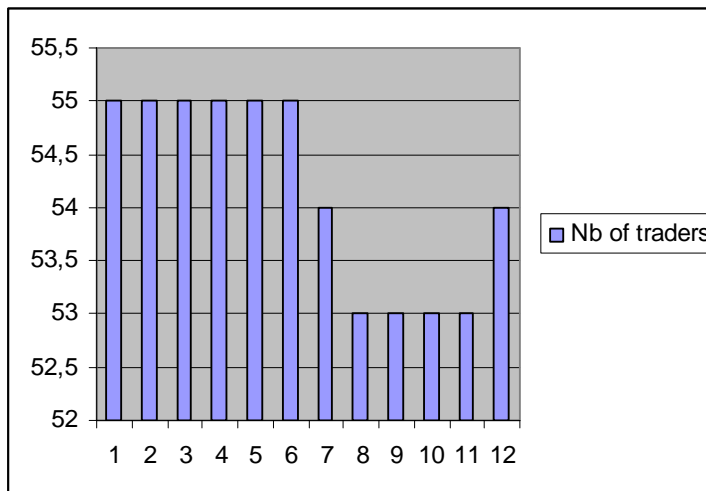
For the other vegetables, there are no differences in the origin in the year, but some changes in the number of traders supplying the vegetables in the different months. For water convolvulus, the number of traders is quite stable (see Figure 22): the minimum is 84 from October to December (dry season), and the maximum is 89 in May (rainy season).

Figure 22- Variations in the supply of water convolvulus

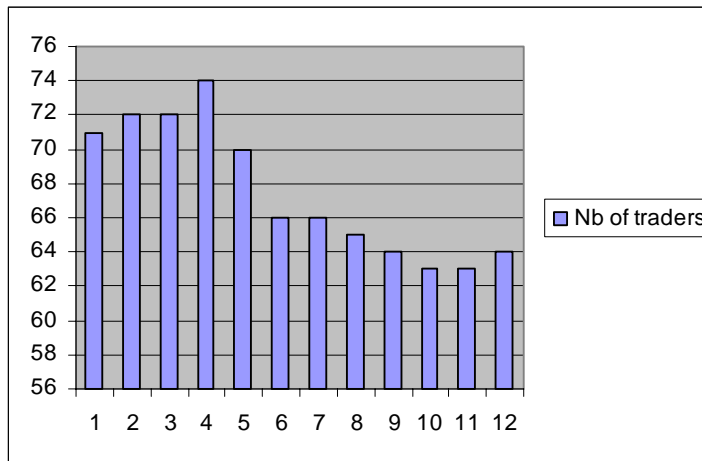


For eggplant, the number of traders is also stable: from 53 between August and November to 55 from January to June (Figure 23).

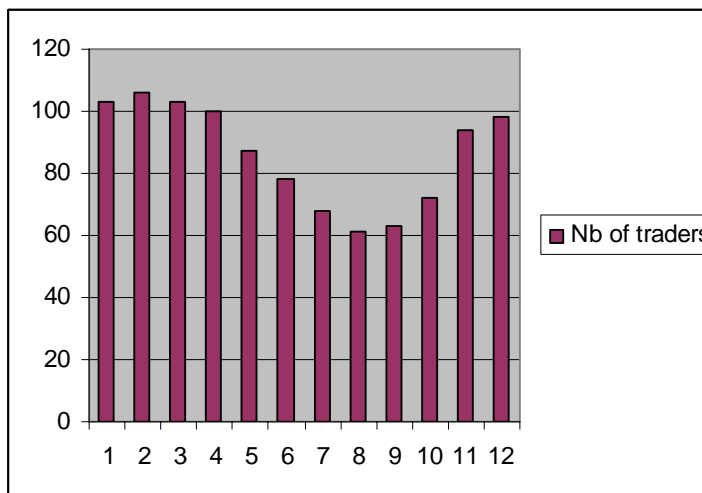
Figure 23- Variations in the supply of eggplant



For yard long bean, the supply is highest from January to May (70 to 74 traders) in the rainy season and lowest from September to December (62 to 64 traders) in the dry season (Figure 24).

Figure 24- Variations in the supply of yard long bean

The supply of lettuce is lowest from July to October (60 to 70 traders) and highest from November to May (more than 80 traders) in the dry season (Figure 25).

Figure 25- Variations in the supply of lettuce

VII Marketing Chains

A) Different types of traders

When we designed the sample of Activity 1, we decided to interview 56 retailers and 36 wholesalers. But in fact this distinction is not easy as a lot of traders combine wholesale and retail trade. This is shown by Table 15 which lists the different types of merchants found in the sample.

Table 15 - Different types of traders

Type of trader	Frequency	Percentage
Collector	3	3.3
Wholesaler	1	1.1
Retailer	40	43.5
Wholesaler/ retailer	15	16.3
Collector/ wholesaler/ retailer	18	19.6
Producer/ collector / wholesaler/ retailer	10	10.9
Producer/ collector/ wholesaler	4	4.4
Producer /collector/ retailer	1	1.1
Total	92	100

Collectors, who buy and transport products from the production areas to sell them in the market, may be divided into two groups: local collectors and collectors at the market:

- Local collectors collect commodities from the farm and sell them wholesale in the villages or bring them to the market places and sell them wholesale.
- Collectors at the market buy and collect commodities along the market places rent some hand carts to carry their commodities to the inside of markets.

Wholesalers stay at the market place, they buy from collectors or producers and sell back to retailers.

Type of merchants by market

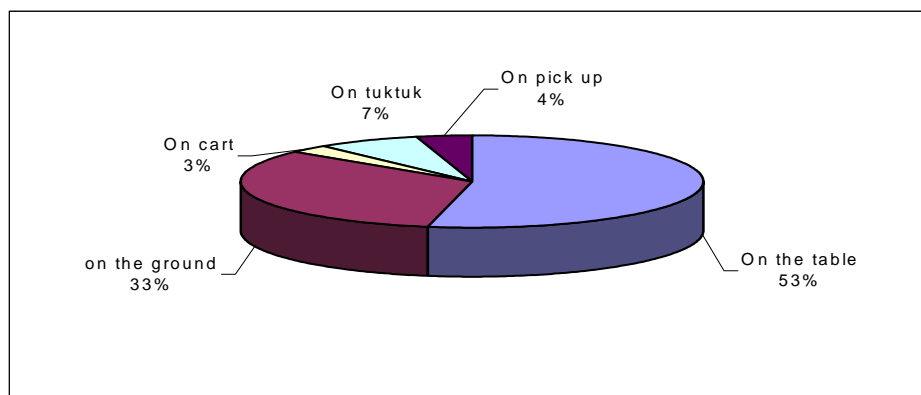
In Thongkhankham and in Thatluang, the percentage of specialised retailers is more important than in Kuadin (see Table 19). In Kuadin, the percentage of traders combining collection, wholesale and retailing is the highest among the three markets (34% compared with 16% and 4%). In Thatluang a big percentage of traders (41%) combine wholesale and retail functions, and the percentage of collectors is small (4.5% for producer/collector/wholesalers).

Table 16 – Types of merchants in the different markets

Type of merchants		Percentage of merchant by Market		
		TKK	TL	KD
1	Collector	7.9		
2	Wholesaler		4.5	
3	Retailer	47.3	45.6	37.5
4	Wholesaler/ retailer	2.6	40.9	15.6
5	Collector/ wholesaler/ retailer	15.7	4.5	34.4
6	Producer/ collector / wholesaler/ retailer	21.2		6.3
7	Producer/ collector/ wholesaler	5.3	4.5	3.1
8	Producer /collector/ retailer			3.1
	Total	100	100	100

B) Location of vegetable selling

Commodities are sold on tables for 53% of interviewed traders while commodities sold on the paved floor represent 33% of traders, commodities are sold at tuk tuk for about 7% of traders, at the pick-up trucks for around 4% of traders and at the handy carts for 3% of traders (see Figure 26). Permanent stalls of vegetables represent about 73% of retailers, 12% of wholesaler-retailers, 6% of collector-wholesaler-retailers and 2% of other traders.

Figure 26 - Location of the sale for the interviewed merchants**C) Transport of commodities**

Most traders have recourse to tuktuk (25%), pickup (18%), bus or trucks (24%) to transport commodities to the market (see Table 17). Some traders mention carts (33%) but carts are used inside the market, not from farm to market. Most traders (74%) are not owners of vehicles, they rent them. According to a survey on 100 traders in 1999, products were brought to the market by tuk-tuk for more than 60% of traders (Potutan et al, 1999).

Table 17– Nature of transport used by traders

Nature of transport	Number	Percentage
Tuktuk	23	25
Pick up	17	18
Cart	30	33
Bus, truck	22	24
Total	92	100

D) Quantities sold by traders

The figures are based on only one surveyed multi-vegetable merchant in one day and may be limited when used as representative figures. Yet they indicate that the quantities sold per day are small, even at the wholesale stage (see Table 18 and Table 19): the maximum for leafy vegetables is 144 kg/day for producer/collector/wholesalers selling big Chinese mustard, it is 300 kg/day for collectors of cucumber and 163 kg/day for wholesaler/retailers of cucumber; wholesalers of leafy vegetables sell between 18 kg/day (for small Chinese mustard) and 48 kg/day (for water convolvulus). Retailers sell between 4 kg/day (for cherry tomato) and 15 kg/day (for cucumber). The interviewed traders sell 3 to 5 types of vegetables (but this includes the category aromatic vegetables, which encloses a lot of different types of vegetables).

Table 18 - Quantities of leafy vegetable sold by type of traders (kg/day)

Type of Traders	Pakchoy	Chinese mustard small	Chinese mustard big local	Chinese mustard big import	Lettuce	Water convolvulus	Chinese kale local	Chinese kale import
Retailer	8	5	6	9	9	10	7	9
Wholesaler	25	18			43	48		
Wholesaler/ retailer	53	41	54	33	50	44	35	37
Collector	66	72	66		54	42	18	
Producer/collector/wholesaler/retailer	117	77	51		53	54	18	
Producer/collector/ retailer	9	4	9		9	9	9	
Producer/collector/ wholesaler	92	66	144		54	54	102	

Table 19– Quantities of fruit-vegetables sold by type of traders (kg/day)

Type of Traders	Cucumber		Round tomato		Olive tomato		Long bean	Cherry tomato	Eggplant
	Local	Import	local	Import	local	import			
Retailer	15	13	6	6	6	6	5	4	8
Wholesaler	59						36		60
Wholesaler/ retailer	163	73	62	31	60	29	29		45
Collector	300		150		140		180	152	
Producer/collector/ wholesaler/ retailer	90		126	24	72		61	37	121
Producer/collector/ retailer	9						4		
Producer/collector/ wholesaler	90	90					40	30	36

E) Organisation of selected marketing chains

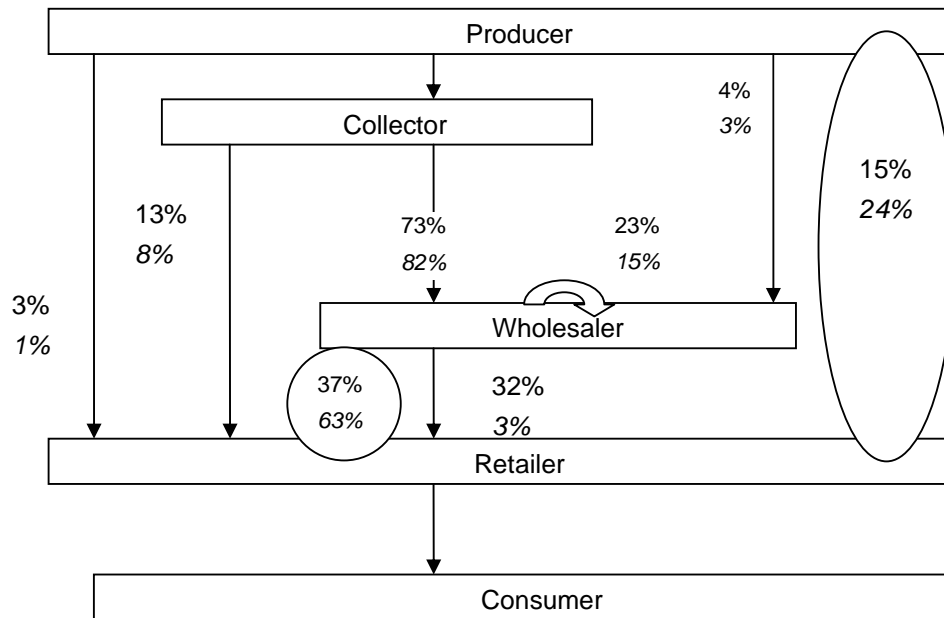
From the data on the activities and on the nature of the suppliers of the different actors, we derived the organisation of marketing chains from farmers to consumers in terms of the different intermediaries involved. We present here the results for water convolvulus and big round tomato (local and imported).

1. Marketing chain of water convolvulus

Although water convolvulus is a perishable vegetable produced close from the urban market, its marketing chain is quite complex and involves different intermediaries, frequently combining functions (see Figure 27). The typical chain involves retailers being themselves wholesalers (it represents 37% of retailers, and 63% of quantities sold retail). The majority of wholesalers are supplied by collectors, themselves supplied by producers (73% of wholesalers, 82% of wholesale transactions). Some wholesalers are supplied by other wholesalers (23% of wholesalers, 15% of quantities sold wholesale) or by producers (4% of wholesalers, 3% of quantities).

Other chains are indicated below:

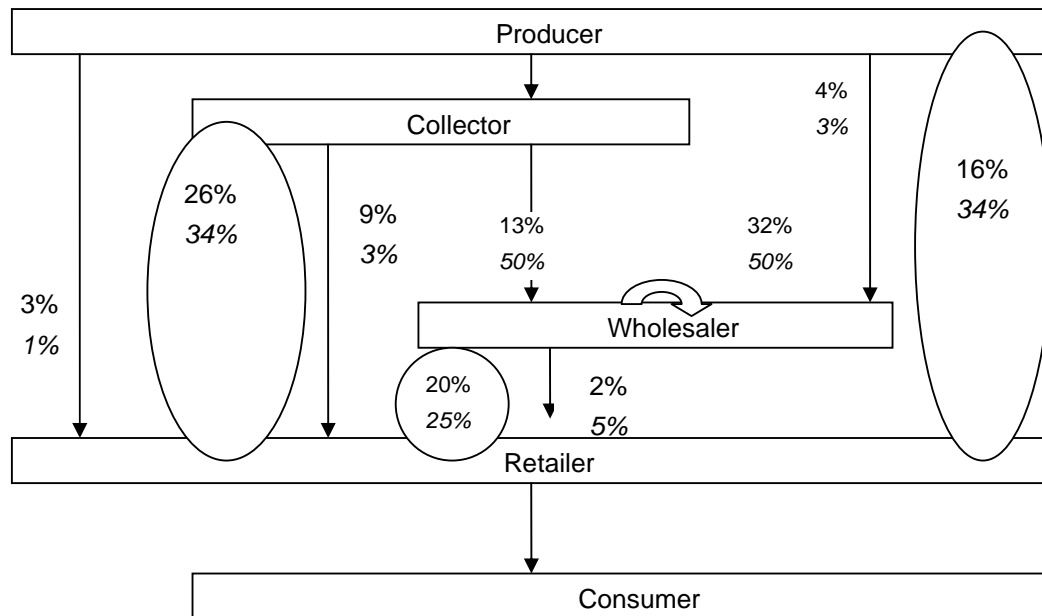
- Retailers being supplied by wholesalers (32% of retailers, 3% of quantities)
- Retailers being themselves producers (15% of retailers, 24% of quantities)
- Retailers being supplied by collectors (13% of retailers, 8% of quantities sold retail)
- Retailers being supplied by producers (3% of retailers, 1% of quantities)

Figure 27 - Marketing chain of water convolvulus

Legend: The percentages in normal font represent the percentages of stakeholders buying the product (retailers and wholesalers) supplied by the different types of suppliers (wholesalers, collectors, producers). The percentages in italics represent the percentages of quantities going through the different chains (using the data on quantities sold by the different stakeholders). Besides, the round arrow (↻) represents the supply by the same category of stakeholders (wholesalers supplied by other wholesalers) and the round shape ○ represents combination of functions (wholesalers or producers acting as retailers)

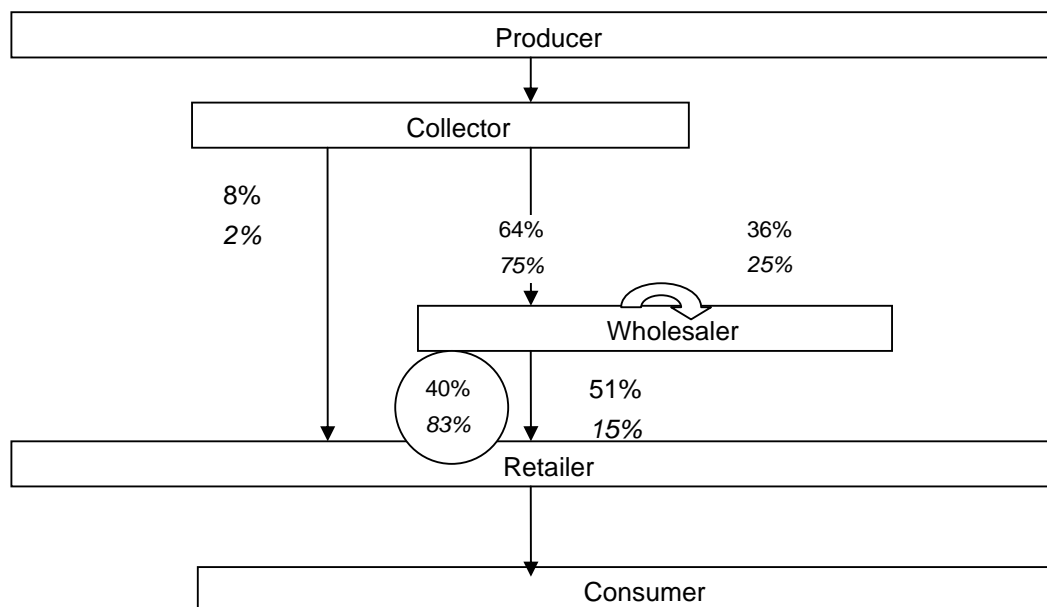
2. Local round tomato

The organization of marketing chains is similar for local round tomato and water convolvulus (see Figure 28). One specific aspect is a high percentage of retailers (26%) being themselves collectors.

Figure 28- Marketing chain of local round tomato

3. Imported round tomato

As regards imported round tomato, marketing chains are more simple than for local tomato (see Figure 29): retailers are supplied by wholesalers (51% of retailers, 15% of quantities), or they are themselves wholesalers (40% of retailers, 83% of quantities). Few retailers (8%) are supplied directly by collectors. Wholesalers are supplied by collectors (64% of wholesalers, 75% of quantities), or, less frequently, by other wholesalers (36% of wholesalers, 25% of transactions).

Figure 29 - Marketing chain of imported round tomato

VIII Traders' characteristics and strategies

A) Residence of merchants

All the interviewed traders live in Vientiane municipality, mostly in Saysetha (35%), Hatsaiphong (26%) and Chanthabury (15%) as indicated in Table 20.

Table 20 – Place of residence of merchants

Districts	Percentage of traders living in the district	Maximum distance from district to city centre
Saysetha	34.8	4
Hatsaiphong	26.1	15
Chanthabury	15.2	1
Nasaithong	1.1	20
Sikhotabong	6.5	6
Sisattanak	15.2	3
Saythany	1.1	12
Total	100.0	

B) Relation between suppliers and buyers

Relationships between the vegetable merchants and their suppliers are close: around 78% of traders are familiar with their suppliers from their interactions in the market (see Table 21). 10% of traders live in the same village that their suppliers. From the given answers, the priority sales are few, i.e. few traders have to sell to their regular suppliers in priority – yet this answer should be taken with caution, as it is not easy to get details on business-to-business relationships through on-shot interviews

Table 21 - Traders' relationships with suppliers

	Percentage
Regular relationships, known in the market	78
Regular relationships, originate from the same village	10
Regular relationships, priority sales	2
Regular relationships, relative of mine	2
Same village	10

C) Experience of buying and selling

The number of years in business is indicated in Table 22. It suggests that collectors (including producer/collectors) have more years in the business than wholesalers and retailers.

Table 22 – Number of years in business by category of trader

Type of traders	Years in business		
	1 - 4 years	5 - 9 years	Over 10 years
Wholesaler	100%		
Retailer	41%	26%	33%
Wholesaler/ retailer	47%	29%	23%
Collector			100%
Producer/collector/ wholesaler/ retailer			100%
Producer/collector/ retailer			100%
Producer/collector/ wholesaler		100%	

Putting the quantities traded in relation with the number of years in business shows that traders selling higher quantities have been longer in the business - that includes producer/collectors compared with wholesalers and retailers (see Table 23).

Table 23 – Number of years in the business by quantities sold per day

Experience in the business	Quantities sold per day (kg)
1-4 years	112
5-9 years	153
Over 10 years	205

D) Access to information

Around 91.3% of the merchant have information on the market from their trading friends and only 8.7% of the merchants get information on the market from the national radio. This information was supplied in the year 2002 by the department of agriculture one day per week, during 50 minutes, at 9.30 a.m, thanks to FAO support (it stopped at the end of 2002).

E) Problems declared by merchants

It was difficult to get traders' talk about the difficulties met in their business. The few answers relate to bad quality of vegetables (five answers) and lack of vegetables in the rainy season (4 answers). In the traders' survey of 1999 (Potutan et al, 1999), inappropriate quality of vegetables was the most frequently quoted difficulty (25% of answers), followed by lack of supply (20% of answers) and lack of storage facilities (12% of answers).

IX Economic results of traders

A) Traders' expenditures

Traders' expenditures are indicated in Table 24. The highest costs apart from the category "other costs" (which include handling and packaging costs, and sometimes food costs) are transport costs, especially for collectors and wholesalers.

Table 24 – Traders' expenditures

Type of merchants	No. in sample	Transport Costs	Storage Costs	Taxes	Rental costs	Other costs	Total
Retailer	27	8,074	1,938	1,875	5,190	11,659	28,736
Wholesaler/retailer	6	19,000	9,583	1,583	5,083	10,500	45,750
Wholesaler/retailer/collector ³	13	12,923	3,922	2,461	4,461	21,385	45,153
Collector	2	14,500	1,000	1,000	2,500	10,000	29,000
Wholesaler	1	13,000	4,000	3,000	4,000	15,000	39,000
Producer/collector/wholesaler	1	15,000	5,000	1,000	5,000	2,000	28,000
Average	50	11,441	3,436	1,962	4,852	13,856	35,247

B) Traders' incomes

The incomes have been calculated with the following formula:

- Income= (Resale value-Purchase value)-Marketing costs
- Resale value = Resale value yesterday
- Purchase value= Purchase value of quantity sold yesterday=Price of quantity purchased yesterday and day before yesterday x quantity sold yesterday = (Purchase value yesterday + Purchase value the day before yesterday)/ (quantity purchased yesterday + quantity purchased the day before yesterday) x quantity sold yesterday - We take account of the fact that quantity purchased everyday are commonly sold in two days-

Table 28 shows the average net profit per day of the merchants. Some merchants are losing money because their commodity can not be completely sold in one day, so one should consider the average figures rather than minimum and maximum incomes. As a common result, retailers are found to earn the lowest income, and wholesalers the highest.

³ In this category we have included Producer-collector-wholesaler-retailer and Producer-collector-retailer.

Table 25 – Traders' daily income (kip)

	No. in sample	Minimum	Maximum	Average
Retailer	27	-38000	306,000	44,209
Wholesaler/retailer	6	-17000	184,500	53,310
Collector/Wholesaler/retailer	13	1041	399002	89,841
Collector	2	56,000	96,000	76,000
Wholesaler	1	110,935	110,935	110,935
Producer/Collector/Wholesaler	1	125,846	125,846	125,846
Total	50	-38000	399,002	61,406

C) Margin rates

We have calculated the income as the ratio of the purchase value to estimate the margin rate, which varies between 7% for retailers, 14% for wholesalers and 18% for collectors – the margin of producer/collector/wholesaler is higher as producers sell some own produce- (see Table 26).

Table 26 – Net margin rates

	No. in sample	Net margin rate (% of purchase value)
Retailer	27	7
Wholesaler/retailer	6	11
Collector/Wholesaler/retailer	13	17
Collector	2	18
Wholesaler	1	14
Producer/Collector/Wholesaler	1	36
Total	50	15

The deconstruction of resale value between the different categories of costs and margins is indicated in Table 27. It shows that the traders' incomes represent a small percentage of resale value (between 9% for wholesaler-retailers and 23% for collectors).

Table 27 – Deconstruction of costs, margins and revenues

		Amount (Kip/day)	% of resale value
	Purchase value	329276	82%
	Rental cost	5190	1%
Retailers	Taxes	1875	0%
Number in sample : 27	Transport costs	8074	2%
	Storage costs	1938	0%
	Other costs	5190	1%
	Net margin=Income	50679	13%
	Resale value=Revenue	402222	
	Purchase value	800000	84%
	Rental cost	3000	0%

Wholesalers	Taxes	4000	0%
Number in sample : 1	Transport costs	13000	1%
	Storage costs	4000	0%
	Other costs	15000	2%
	Net margin=Income	111000	12%
	Resale value=Revenue	950000	
	Purchase value	350000	73%
	Rental cost	2500	1%
Collectors	Taxes	1000	0%
Number in sample : 2	Transport costs	14500	3%
	Storage costs	1000	0%
	Other costs	2500	1%
	Net margin=Income	108500	23%
	Resale value=Revenue	480000	
	Purchase value	464273	97%
	Rental cost	5083	1%
Wholesaler-Retailers	Taxes	1583	0%
Number in sample : 6	Transport costs	19000	4%
	Storage costs	9600	2%
	Other costs	10500	2%
	Net margin=Income	53294	9%
	Resale value= Revenue	563333	
Collector-Wholesaler-Retailer	Purchase value	480390	100%
Number in sample : 13	Rental cost	4461	1%
	Taxes	2461	1%
	Transport costs	12923	3%
	Storage costs	3922	1%
	Other costs	21384	4%
	Net margin=Income	89843	15%
	Resale value=Revenue	615384	
	Purchase value	346154	72%
Producer-Collector-Wholesaler	Rental cost	5000	1%
Number in sample : 1	Taxes	1000	0%
	Transport costs	15000	3%
	Storage costs	5000	1%
	Other costs	2000	0%
	Net margin	125846	25%
	Revenue	500000	

X Comparison between local and imported products

A) Comparison in terms of quality

1. Olive tomato

When asked about their appreciation of the quality of local and imported olive tomato, a majority of traders (more than 60%) have a good appreciation of imports in terms of colour, size and absence of stains, as compared with the appreciation of local tomato (see Table 28). On the other hand, freshness, taste, and alleged lack of chemical used of local olive tomato is considered as good by 80 to 90% of traders, while traders do not find these characteristics in imported olive tomato. The length of conservation before degradation is also considered higher for local olive tomato (4 to 5 days, compared with 2 to 4 days for imported tomato).

Table 28 - Traders' appreciation of local and imported olive tomato

Olive tomato				
Characteristics	Local (%)		Import (%)	
	good	bad	good	bad
Colour	38.3	61.7	75.0	25.0
Size	25.0	75.0	60.0	40.0
Stains	38.9	61.1	58.8	41.2
Freshness	96.2	3.8		100.0
Use of chemicals	90.0	10.0	5.0	95.0
Taste	80.9	19.1	9.8	90.2
	Number of days (local)		Number of days (imported)	
Length of conservation (days)	4-5		2-4	

2. Round tomato

The appreciation of colour, size, and stains, is similar for local and imported round tomato (see Table 32). On the other hand, traders declare that freshness of local round tomato is good, while freshness of imported tomato is bad. Taste of local tomato is also appreciated by a majority of traders (90%) while a majority of traders (60%) have bad appreciation of the taste of imported round tomato. Imports are considered as using a majority of chemicals by a majority of traders (90%) while a majority (85%) considers that the use of chemicals is correct for local round tomatoes. Finally, the number of days of conservation is considered higher for local round tomato (3 to 5 days) relative to imported tomato (2 to 4 days).

Table 29 - Traders' appreciation of local and imported round tomato

Characteristics	Local (%)		Import (%)	
	good	bad	good	bad
Color	68.1	31.9	70.7	29.3
Size	87.5	12.5	90.0	10.0
Stains	50.0	50.0	50.0	50.0
Freshness	100.0			100.0
Use of chemical	85.0	15.0	10.0	90.0
Taste	91.3	8.7	39.0	61.0
	Number of days (local)		Number of days (imports)	
Length of conservation (days)	3-5		2-4	

3. Cucumber

For cucumber, a majority of traders (more than 90%) have a good appreciation of imports in terms of size and absence of stains, as compared with the appreciation of local products (see Table 30). On the other hand, colour, freshness, taste, and alleged lack of chemical used of local cucumber is considered as good by 90 to 100% of traders, while traders do not find these characteristics in imported cucumber. The length of conservation before degradation is also considered higher for local cucumber (3 to 4 days, compared with 2 to 3 days for imported cucumber).

Table 30 - Traders' appreciation of local and imported cucumber

Characteristics	Local (%)		Import (%)	
	good	bad	good	bad
Color	88.5	11.5	15.4	84.6
Size	15.0	85.0	94.7	5.3
Stains	-	100.0	100.0	-
Freshness	100.0	-	-	100.0
Use of chemical	95.0	5.0	5.0	95.0
Taste	100.0		2.6	97.4
	Number of days		Number of days	
Length of conservation (days)	3-4		2-3	

4. Chinese kale

The results are similar than for cucumber: a majority of traders (more than 70%) have a good appreciation of imports in terms of size and absence of stains, as compared with the appreciation of local products (see Table 31). On the other hand, freshness, taste, and alleged lack of chemical used of local cucumber is considered as good by more than 90% of traders, while traders do not find these characteristics in imported Chinese kale. The length of conservation before degradation is also considered higher for local products (2 to 6 days, compared with 2 to 4 days for imported Chinese kale). The color of local Chinese kale is appreciated by a majority of traders (70%) while for imported products the answers are more balanced.

Table 31 - Traders' appreciation of local and imported Chinese kale

Characteristics	Local (%)		Imports (%)	
	good	bad	Good	bad
Color	70.0	30.0	56.7	43.3
Size	28.6	71.4	92.9	7.1
Stains		100.0	100.0	
Freshness	100.0			100.0
Use of chemical	94.7	5.3	5.3	94.7
Taste	100.0		5.6	94.4
	Number of days		Number of days	
Length of conservation (days)	2-6		2-4	

B) Comparison in terms of prices

The comparison between the prices of local versus imported products (purchase and resale prices by retailers) shows that the prices are similar, the prices of imported products being slightly higher (see Table 32):

- 5% for round tomato purchase price, 8% for round tomato selling price
- 6% for cherry tomato purchase price, 5% for cherry tomato selling price
- 12% for cucumber purchase price, 2% for cucumber resale price
- 5% for Chinese kale purchase price, 4% for resale price.

Table 32 – Prices of local and imported commodities

Commodity		Purchase price (Kip)			Resale price (Kip)		
		Min	Max	Mean	Min	Max	Mean
Tomato round red	Local	3,000	8,000	5,800	4,000	10,000	6,800
	Import	4,000	8,000	6,100	5,000	10,000	7,300
Tomato olive red	Local	1,500	8,000	5,600	4,000	10,000	6,900
	Import	4,000	8,000	6,000	5,000	10,000	7,200
Cucumber	Local	800	1,500	1,100	1,500	2,500	1,700
	Import	800	2,000	1,200	1,500	2,500	1,800
Chinese kale	Local	2,000	5,000	4,000	3,000	6,000	5,100
	Import	2,000	5,000	4,300	3,000	6,000	5,300

C) Results of pesticide analysis

In order to confront traders' perceptions of vegetable safety with the actual level of pesticide residues, some analysis was carried out on local and imported vegetables. The following method was used for vegetable sample collection.

In early May, we went to Thonkhankham market to collect 5 imported tomatoes, 5 external leaves of imported Chinese cabbage, 5 leaves of Chinese cabbage from Boloven Plateau, 5 leaves of Chinese kale from Donechan village (in Vientiane Municipality). We collected also 5 leaves of Chinese kale in Hadokeo village, Hatsaiphong District. The samples were analyzed several days after in Hanoi RIFAV laboratory, by a quick test used in Taiwan. This test enables to identify excessive pesticide residues, for two insecticide categories (carbonate and organophosphate).

The analysis shows no excessive pesticide residue for Lao vegetables, while Thai Chinese cabbage is characterized by very high excess of residues (see Table 33 and Table 34). No excess residues were identified for local or imported tomato (but these are more subject to excess in fungicides and bactericides than in insecticides). This type of analysis should be replicated on a larger sample.

Table 33 – Results of pesticide analysis for imported vegetables

Vegetables	% inhibition of AChE (1)	
	Carbamate	Organophosphate
Tomato	15.67	17.12
Chinese cabbage	72.15	55.42

(1) a percentage higher than 25% indicates excess in pesticide residue

Table 34 – Results of pesticide analysis for local vegetables

Vegetables	% inhibition of AChE	
	Carbamate	Organophosphate
Chinese kale	17.56	19.43
Chinese cabbage	20.17	22.9

(1) a percentage higher than 25% indicates excess in pesticide residue

XI Conclusion

The following conclusions can be drawn from the literature review and the surveys:

- The peri-urban area, less than 30 kilometers of the city center, is a major supplier of vegetables, as it supplies more than 80% of leafy-vegetables and more than 70% of fruit vegetables.
- Vegetable supply is in deficit for some vegetables in the rainy season (tomato, Chinese kale, cucumber, big Chinese mustard), from May to November, which leads to imports from Thailand, and doubling of prices. Hence the development of local production of tomato, Chinese kale, cucumber and big Chinese mustard in the rainy season is a major strategy for bringing additional income opportunities for farmers and traders, and decrease consumer prices. This implies farmers' training in terms of pesticide and variety use, as well as new technologies for off-season production (including tomato grafting).
- There is not a clear specialisation of traders and market places between wholesale and retail activities, which is due to the little developed state of market infrastructures, and small quantities transacted for each actor (the maximum is 300 kg/day for collectors of cucumber). As recommended by MAF/FAO in previous reports (MAF, 2002), a big and specialized wholesale market would certainly add extra transport costs, and it is rather recommended to upgrade the existing markets paving, drainage and roof shelter.
- Incomes are highly variable from one trader to the other, on the whole marketing margins are quite small (7 to 36% of purchase price).
- Quality is a major factor in the purchase strategies of consumers and traders, especially as relates to freshness, taste and safety. According to these criteria, local production is presently preferred to imports. But imported vegetables are more appreciated as regards size and lack of stains.

In December 2002, some results of the market survey, were presented to a panel of traders, farmers and local agents in charge of vegetable production and marketing development and some market calendars were discussed (Lecoq, 2003). The meeting confirmed the need to better assess the comparative advantage of Thailand for producing in the rainy season. It also enabled to identify some vegetables that present some untapped market opportunities, including Chinese cabbage, big onion, carrot and chilli in the dry season, coriander and lettuce in the rainy season, peppermint and eggplant in the beginning of the rainy season (in addition to tomato and Chinese mustard). The development of agro-industry to absorb production surplus in the dry season has also been recommended by the participants.

Finally, further investigation is needed to confirm the vegetable safety of Lao products and the risks pertaining to Thai vegetables. Then the commercial promotion of Lao vegetable safety could be organised, through media communication, control and labelling of Lao vegetables.

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Appendix

Questionnaire on Activity 1 (market flows and chains)

1. Date:
2. Identification number:.....
3. Name of the market:.....
4. Place of residence of merchant:.....
5. Type of merchant:

<input type="checkbox"/>	producer	<input type="checkbox"/>	collector	<input type="checkbox"/>	wholesaler
--------------------------	----------	--------------------------	-----------	--------------------------	------------
6. If the trader is also the producer, what share of products comes from his farm?

<input type="checkbox"/>	less than one half	<input type="checkbox"/>	one half	<input type="checkbox"/>	more than one half
--------------------------	--------------------	--------------------------	----------	--------------------------	--------------------
7. Type of location:

<input type="checkbox"/>	on the ground	<input type="checkbox"/>	in a shop	<input type="checkbox"/>	from a truck
<input type="checkbox"/>	on a table	<input type="checkbox"/>	from a motorcycle	<input type="checkbox"/>	from baskets
8. How many vegetables do you sell every day during this season? Where do they come from?

No	Vegetable	Unit	Min. quantity	Max. quantity	Average	Area of production		Supplier	Other
						Dist.	Villages		
# 1	Pakchoy	kg							
# 2	Chinese mustard, small	kg							
	Chinese mustard, big, local								
	Chinese mustard, big, Thai								
# 3	Lettuce	kg							
# 4	Cucumber								
	Lao	kg							
	Cucumber. Import	kg							
# 5	Yard long bean	kg							
# 6	Tomato, round, red, local	kg							

	Tomato, olive, local													
	Tomato, round, costs, local													
	Tomato, round, red, Thai													
	Tomato, olive, Thai													
# 7	Egg plant, round, green	kg												
# 8	Water convolvulus	kg												
# 9	Chinese kale local	kg												
	Chinese kale import	kg												
9. Are there some changes in your sources of supply the rest of year? (origin, month)														
No	Vegetable		1	2	3	4	5	6	7	8	9	10	11	12
# 1	Pakchoy													
# 2	Chinese mustard, small													
	Chinese mustard, big, local													
	Chinese mustard, big, Thai													
# 3	Lettuce													
# 4	Cucumber Lao													
	Cucumber. Import													
# 5	Yard long bean													
# 6	Tomato, round, red, local													
	Tomato, olive, local													
	Tomato, round, costs, local													
	Tomato, round, red, Thai													
	Tomato, olive, Thai													
# 7	Egg plant, round, green													
# 8	Water convolvulus													
# 9	Chinese kale local													
	Chinese kale imp													
# 4	Cucumber													
# 5	Yard long bean													
# 6	Tomato													
# 7	Egg plant													
# 8	Water convolvulus													
# 9	Chinese kale													

10. Who are your customers?

☐ retailers ☐ restaurants ☐ final consumers ☐ Others (detail)

11. How do you transport the produce to the market?

☐ by bicycle ☐ by truck ☐ by hand tractor ☐ by bus others

☐ by motorcycle ☐ by foot ☐ by tuk tuk ☐ by pick up

12. Do you ever stop selling vegetables?
If yes, why so?

☐ yes ☐ No

☐ prices are too low ☐ I have problems storing the vegetable ☐ others (detail)
.....

☐ I do not have enough products to sell ☐ Business is slow ☐ I have too much work at the farm

13. When does this happen?

..... To
.....

14. When do you sell most?

..... To
..... and give the reasons:.....

15. When do you sell least?

..... To
..... and give the reasons:.....

INTERVIEWING GUIDE ON TRADERS' STRATEGIES (Activity 2)

(The traders have already been interviewed in Activity 1)

Name of market:

I. Marketing behaviour

Nature of trader: Producer Collector Wholesaler Retailer

List the different products traded by order of importance present on the stall in the day of interview (*to be observed at the end of interview*)

At what time do you get your supply?

From _____ To _____

❖ At what time do you sell?

From _____ To _____

❖ Do you sell all the months of the year? Yes No

If no, at what months do you stop selling?

Why?

What do you do the months when you do not sell?

❖ For the ones transporting the product to the market, state the means of transport used :

Motorbike	Owned	Rented
Truck	Owned	Rented
Pick up	Owned	Rented
Bus		
Others (specify)		

II. Organisation and information

❖ How many suppliers do you have? For which products? Are they fixed everyday or variable from one day to the other?

	Fixed suppliers	Variable suppliers
Product :		
Product :		

- ❖ What is the nature of your relationship with your suppliers :
 - ❖ They are relatives of mine
 - ❖ We belong to the same village or district
 - ❖ I have been knowing them for several years
 - ❖ I give them inputs (seeds, fertilisers...)
 - ❖ I give them credit
 - ❖ I have to buy from them in priority
 - ❖ They have to sell to me in priority
 - ❖ We know each other from the market
 - ❖ Others (specify)

Did you already have problems with your suppliers?

If yes, what type of problems?

- ❖ Are the suppliers paid :

cash immediately	after the sale
it depends on suppliers	it depends on time of the year

For producers, collectors and wholesalers only:

- ❖ How many customers do you have? For which products? Are they fixed everyday or variable from one day to the other?

	Fixed customers	Variable customers
Product :		
Product :		

- ❖ What is the nature of your relationship with your customers :
 - ❖ They are relatives of mine
 - ❖ We belong to the same village or district
 - ❖ I have been knowing them for several years
 - ❖ I give them inputs (seeds, fertilisers...)
 - ❖ I give them credit
 - ❖ I have to sell to them in priority
 - ❖ They have to buy from me in priority
 - ❖ We know each other from the market
 - ❖ Others (specify)

- ❖ Did you already have problems with your customers?
If yes, what type of problems?

- ❖ Do the customers pay :

cash immediately	after the sale
------------------	----------------

- ❖ Do you have cooperation/discussions with other traders :
 - ❖ About purchase prices
 - ❖ About resale prices
 - ❖ To share equipment : transport storage others (specify)
 - ❖ To pool money
- ❖ Do you get some information about vegetable prices :
 - ❖ In the newspapers
 - ❖ On the radio
 - ❖ From other traders
 - ❖ Others (specify)

If you get information from newspapers or radio, is it useful for you?

If not useful for you, why?

III. Comparison between different origins

For traders selling local and imported products

What are the differences between local and imported products?

Name of vegetable: Tomato olive

	Local	Imported from _____
Aspect (colour, size, stains, holes, freshness...)		
Length of conservation (in days)		
Use of chemicals		
Taste		
Purchase price (give examples for the same period) Kip/kg		
Resale price (give examples for the same period) Kip/kg		
Other		

Name of vegetable: Tomato round, red

	Local	Imported from _____
Aspect (colour, size, stains, holes, freshness...)		
Length of conservation (in days)		
Use of chemicals		
Taste		
Purchase price (give examples for the same period) Kip/kg		
Resale price (give examples for the same period) Kip/kg		
Other		

Name of vegetable: Cucumber

	Local	Imported from _____
Aspect (colour, size, stains, holes, freshness...)		
Length of conservation (in days)		
Use of chemicals		
Taste		
Purchase price (give examples for the same period) Kip/kg		
Resale price (give examples for the same period) Kip/kg		

Name of vegetable: Chinese kale (big)

	Local	Imported from _____
Aspect (colour, size, stains, holes, freshness...)		
Length of conservation (in days)		
Use of chemicals		
Taste		
Purchase price (give examples for the same period) Kip/kg		
Resale price (give examples for the same period) Kip/kg		
Other		

IV. Economic results (monitoring of accounts)

	Day before yesterday	Yesterday	Minimum during the year (state month)	Maximum during the year (state month)
Purchased quantity (kg)				
Purchase value (kip)	P1	P2		
Resale quantity (kg)				
Resale value (kip) R				
Transport costs				

(kip) TC				
Storage costs (kip) SC				
Taxes tC (kip)				
Rental costs RC (kip)				
Other costs OC (kip)				

- ❖ Does your business allow you to provide for the basic needs of your household?

If no, what the other sources of income in the household?

- ❖ Have you ever lost entirely your capital?
If yes, how often did this happen since the beginning of your business?

- ❖ Number of years since start of business:

Conclusion

- ❖ What are the main difficulties you face in the conduct of your business (by order of importance)?
.....
.....
.....
- ❖ What are your recommendations for Lao producers to improve the supply of the market?

OTHER INFORMATION AND COMMENTS

.....
.....
.....
.....