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Market Development for Fresh Peri-urban Produce: Summary of SUSPER Project Activities

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SUSPER

Sustainable Development of Peri-urban Agriculture in South-East Asia Project

(Cambodia, Lao PDR, Vietnam)

Note: The memorandum herewith is a summary of the findings of research done cooperatively by CIRAD (Paule Moustier, Muriel Figuié, Isabelle Vagneron, Jean-François Lecoq), AVRDC (Mubarik Ali), RIFAV (Hoang Bang An, Nguyen Thi Tan Loc, Le Nhu Thinh, Ngo Van Nam, Le Thuy Hang, Trinh Quang Thoai, Nguyen Kim Chien), VASI Department of Agriculture Systems (Bui Thi Thai, Ho Thanh Son), Ho Chi Minh City University of Agriculture Faculty of Fisheries (Le Thanh Hung, Nguyen Phu Hoa, Huynh Pham Viet Huy, Bui Thi Phuong Thao), Cambodian Ministry of Agriculture Department of Planning (Chan Sipana) and Laotian Ministry of Agriculture Department of Planning (Somsack Kethongsa), Cambodian Ministry of Agriculture Department of Credit (Chhean Sokhen), the NGO Srer Khmer (Meach Centmill).

Objectives

The key objective of the "market development" component is to identify problems and solutions in order to achieve a better matching between the peri-urban supply and the urban market demand. Bringing these two aspects into line with one another relates to the quality, quantity and consistent supply of produce available on the market. A second objective is to ascertain how to disseminate relevant information on market opportunities in an efficient and effective manner to the market stakeholders to help them in their decision-making process and increase cooperation in the market chains.

Approach

I Market Assessment

A methodological workshop on market development for peri-urban produce was held in February 2002. It was attended by two participants from each of the project cities, as well as officials from the Ministry of Agriculture, research institutes and universities. The various steps in assessing the market chains were outlined (see Table 1): (i) analysis of produce consumption, including variability in time and demand for quality; (ii) analysis of the spatial organization of the supply channels (origin of the produce on the markets and nature of intermediaries); (iii) analysis of strategies used by market chain stakeholders, particularly in terms their socio-economic objectives, investments and relationship with other stakeholders; (iv) assessment of various market performance indicators: price variability; imports; matching the supply with the demand for quality and quantity; distribution of income. This assessment led to recommendations for market stakeholders and agents working in development or public policy.

The research is based on surveys made of the market chain stakeholders, producers, retail traders and consumers (see Table 2).

Table 1 - Assessment Grid—Food Commodity Chains

		Objectives	
		Assess market organization	Assess market performance
Nature of survey	Quick, periodical market surveys	Produce origin, nature of purchasers and sellers	Prices, quantities (variations throughout the year)
	In-depth interviews with producers and retail traders	Problems, objectives, relationship with purchasers and suppliers	Income, access to information
	Household surveys		Quantities, quality demand, variability in consumption time, satisfaction with regard to quality

The workshop enabled a pooling of available knowledge regarding organization of the market chains at the outset of the project:

- In the four cities, night wholesale markets are key places where producers (or collectors) come to sell produce to wholesalers or retailers.

- Produce sold at night markets is sourced variously from peri-urban zones, rural zones and imports.

- Markets are often described as unorganized, but it would be more appropriate to describe them as complex, because informal modes of organization do exist, such as relationships of trust and regular transactions among the stakeholders.

- In Hanoi, new forms of distribution—supermarkets and stores—have specific supply chains.

Subsequent to the workshop, a joint survey protocol (quick surveys and in-depth interviews) was put in place for the four cities. It is summarized below. The consumer surveys were conducted in Vietnam only and information about consumer patterns are based on secondary data in Cambodia and Laos (see Table 2).

One specific study dealt with the competitiveness of the tomato market chain in the three countries: comparing the local chain with imported tomato chains. The study was based on data collection of costs, prices and profit margins going back through one entire retail sales network to the production stage for one product (reverse cascade ascent from purchasers to suppliers). The reliability of the information was given special consideration, so in-depth interviews were carried out on a small sample (see Table 3 and Table 4). In Vietnam, an approach ascending and descending the market chains was used starting with the wholesalers (Denlu and Long Bien night markets). In Laos a similar study was slated but could not be performed because of problems reported by the Agriculture Department involving conducting surveys in Thailand.

Table 2 - Key Surveys of Consumer Patterns and Markets

Survey	Type of survey	Year	Number of surveys	Subject
1. Survey on seasonal variation of consumer patterns (Hanoi)	Survey on representative sample	2002-2003	800 households (250 Hanoi urban, 250 Hanoi peri-urban, 150 Ha Tay, 150 Hung Yen), 3 seasons	Quantities, expenses (over the last 24 hours) Appreciation of peri-urban vegetables
2. Survey on consumer perception of quality (Hanoi)	Survey on representative sample	2003	200 households	Consumption practices, perception of health risks
3. Focus group on quality preferences (tomato, water morning glory) (Hanoi)	Focus groups	2004	55 households (in 3 groups)	Perception of quality for tomatoes and water morning glory
4. Surveys on fish consumption (HCMC)	Survey on representative sample	2004	217 households (17 urban districts, 5 peri-urban districts)	Frequency, quantities, type of fish, preferences, criteria in choice
5. Periodical market surveys	Quick survey on representative sample	2002-2003-2004	Hanoi: 2002, 4 times, total = 1,369 traders (1/5;) and 2003, 7 times, 1,877 traders (8 to 16 vegetable types accounting for 80 percent of transactions, except for July to September when surveys dealt only with tomato and cabbage) on wholesale and retail markets Phnom Penh: 1 trader out of 5; 8 vegetable types (40 percent of consumption), 4 times a year. Total traders surveyed = 648 in 2002, 1,108 in 2003 and 465 in 2004 Vientiane: 9 vegetable types, 92 traders in June 2002 (about 1/3), including wholesalers and retailers	Nature of go-betweens between retailers and farmers, origin of produce, quantities, prices
6. Survey on vegetable sales strategies	In-depth interviews with suppliers and purchasers in the same chain	2003	Hanoi: 3 to 10 stakeholders/function type (producers, collectors, wholesalers, retailers), for 4 networks – Total of 25 producers, 15 collectors, 7 retailers Phnom Penh: 51 traders (27 retailers, 12 wholesalers, 9 collectors et 3 producers)	Quantities purchased, relationship with suppliers, including information exchange, commitments between purchasers and sellers, terms and conditions of payment, quality control
7.Survey of safe, organic vegetable market chains (Hanoi)	Cascade interviews to identify commodity chain organization In-depth interviews of purchasers and sellers in the same chain	2002 (and 2004 for farmer groups)	7 stores (out of 10) and 8 retail stands (out of 10) 11 supermarkets (out of 13 selling vegetables) 7 schools in 4 districts, 6 restaurants 4 groups of “safe vegetable” producers and 19 organic producers	Ditto
8. Surveys of fish markets (HCMC)	Quick market surveys and in-depth interviews	2004	38 collectors, 57 wholesalers (4 wholesale markets), 330 retailers (66 retail markets)	Origin of the fish, prices (variation according to season and quality), quantities, relationship between sellers and purchasers

Table 3- Number of Persons Surveyed for Tomato Chain Survey in Vietnam (June 2005)

	Tomatoes – peri-urban, Vietnam	Tomatoes – China
Producers	8 (peri-urban Vietnam, Thu Phu commune, Thuong Tin district, Ha Tay province), in June 2005	8 (China, Tan Thach commune, Tran Con district, Kunming province), in November 2005
Collectors	4	4
Wholesalers	2 (1 Denlu, 1 Long Bien)	2 (1 Denlu, 1 Long Bien)
Retailers	4	4

Table 4- Number of Persons Surveyed for Tomato Chain Survey in Cambodia (March 2005)

	Tomatoes – peri-urban Cambodia	Tomatoes – Vietnam (Dalat)
Producers	10 (Kandal province, Kien Svay, Moukampoul and Ksach Kandal districts)	
Collectors	3 (Kandal province)	
Wholesalers	2 (Chaba Ampou, Dumkor)	2 (Chaba Ampou, Dumkor)
Retailers	2 (Oresey, Chaba Ampou)	2 (Oresey, Chaba Ampou)

II Market Information and Consultation Systems

A) Approach

In order to provide relevant market information for producer decision-making, it is important that they be consulted to ascertain their information needs as well as to discuss with all stakeholders in the market chains problems and possible strategies to see that the supply meets the demand. Market information and consultation systems are a combination of the dissemination of relevant information for marketing decisions to be made by producers, along with setting up coordination among the various stakeholders in the chains to arrive at a mutual diagnosis and an action plan to more effectively respond to market opportunities.

B) Regional workshop

A regional workshop on market information and consultation systems was held in May 2005. It was attended by two persons from each city involved in this type of system. The workshop highlighted the objective, concrete difficulties encountered and approaches used in market information and consultation systems based on international case studies. Details were presented on the systems existing in Vietnam, Cambodia and Laos. Methods of processing statistics and managing data were also presented[1].

[1] See Hoang Bang An and Paule Moustier, 2006. Vegetable market information and consultation systems in the Mekong region. RIFAV, Hanoi, http://www.avrdc.org/susper, 191 p.

C) Market newsletters

In Hanoi, information on the status of the vegetable market was summarized in the form of six market newsletters, five dealing with variations in the supply in terms of price, quantities and origins, and one on quality management (see Table 5). These bulletins were distributed to persons in charge of cooperatives on the project sites, posted on the SUSPER and AGROVIET web sites and sent to a list of thirty or so research and development partners.

In Phnom Penh, two market newsletters were written in 2004, one dealing with the tomato market situation and the other with the cabbage market situation. In Vientiane, one bulletin was prepared in 2004 to summarize the vegetable market situation. It was to be translated and distributed by the Department of Agriculture at the conclusion of the project.

Table 5 - List of SUSPER Market Bulletins in Hanoi

Number	Year	Subject
1	2002	Seasonality of vegetable market in 2002
2	2003	Management of vegetable quality
3	2003	Seasonality of vegetable market in 2003
4	2004	Status of vegetable market June-December 2004
5	2005	Status of vegetable market January-May 2005
6	2005	Status of vegetable market June-December 2005

D) Stakeholders' consultation workshops

In all three countries, consultation workshops were held among producers, sellers and development agents in order to arrive at a mutual diagnosis of market opportunities and come to a consensus about ways of taking advantage of them (Table 6). The workshops also enabled discussion of the needs felt by producers for market information.

Table 6- List of Intra-chain Stakeholders' workshops

Location	Date	Number of producers	Number of retail traders	Number of extension agents and inputs dealers	Total
HANOI					
RIFAV, with participants from the 4 project sites	18/04/03	7 (1 co-op director and 1 producer / project site invited)	2 wholesalers (1 Den Lu, 1 Long Bien)	7 extension agents or inputs sellers, from the various sites	43 (with research agents and administrative personnel)
Dong Du	18/06/03	20			20
Vo Cuong	16/06/03	18	2 (collectors)	2 inputs sellers	20
Tien Duong	06/06/03	21			21
Tien Phong	29/05/03	16	4		20
PHNOM PENH					
Kien Svay	29/05/03	11	22 (6 collectors, 6 wholesalers, 10 retailers)	3	40
VIENTIANE					
Department of Plant Protection	08/11/02	3	6	6	15

E) Pricing information systems

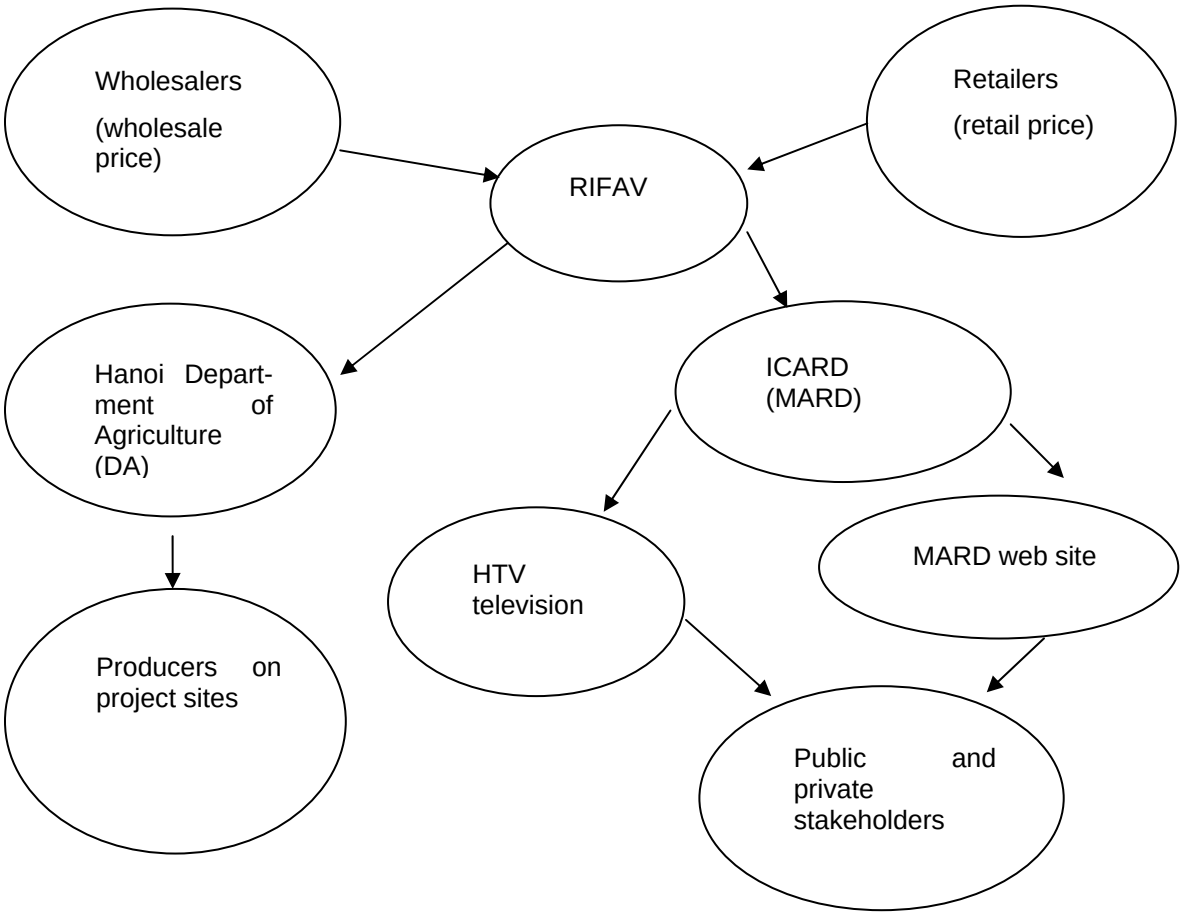
In Hanoi, a daily information system for vegetable prices has been put in place, summarized under Table 7 and Figure 1. The system is relatively inexpensive (US$ 8,000 a year). It is based on a network of market traders who telephone prices in every day.

In Vientiane and Phnom Penh, some advice on the methodology was given to improve already existing systems that were set up by the FAO, in particular to consider produce of which the quality is clearly spelled out when prices are collected.

Table 7- Pricing Information System Protocol in Hanoi

Nature of data	Wholesale price, retail price
Frequency	Daily
Produce	Vegetables = tomatoes (local + imported), cabbage (local + imported), Choy sum; Chinese cabbage; kangkong; wax gourd; green beans; eggplant; cucumbers; eryngium (an aromatic vegetable) Average quality standards set for each vegetable
Markets	Wholesale prices: Long Bien, Den Lu, Dich Vong Retail prices: Thang Cong (intermediate prices between Mo, a working class market, and 19-12, a market frequented by well-to-do customers); Cuu Viet (peri-urban market)
Method of collection	Collected through 3 traders contacted in each market At 4 a.m. for wholesale markets and 9 a.m. for retail markets
Method of dissemination among retail traders and RIFAV	Telephone
Database	Excel and Oracle (ICARD)
Method of dissemination from RIFAV to ICARD and DA	Internet transfer (same day when collected) of tables with prices and simple comments on trends (↗ ↘) and reasons for them
Method of dissemination to farmers and development workers	- Fax/Internet transfer from ICARD to television and from ICARD to DA, and from DA to farmers (same day when collected). - Dissemination by VTV2 television everyday, 3 times a day (7:30 a.m., 6:30 p.m., 23:30 p.m.). - Dissemination through three market bulletins (one for 2004 rainy season, one for winter 2005, one for 2005 rainy season)

Figure 1- Price Collection and Dissemination Network in Hanoi



A survey on the impact of the price information system was conducted in March 2006 that included 100 stakeholders in the market chain: 84 farmers (including 60 on the project sites), 5 wholesalers and 11 collectors. The questions related to the access to price information, and whether and how it is used.

III. Food Safety Promotion

Research on promotion of vegetable safety in Vietnam was conducted according to the following steps:

- Analysis of consumer demand for vegetable quality and for quality signs (see Table 2);

- analysis of the organization of the market chains in response to the demand for quality, in particular “safe vegetables” and “organic vegetables”;

- workshop to promote coordination among producers, traders and consumers on vegetable safety management in Hanoi; highlighting of two bottlenecks: (i) getting the message out to consumers on efforts put forth by producers to achieve quality and (ii) quality control;

- communication on safe and organic vegetable chains to consumers by television and newspapers;

- action research with a safe vegetable co-op on improving communication with consumers (communication material, product labeling) and quality control.

In a context wherein there is a very wide dispersal of production, it is more realistic and effective to promote efforts put forth by producers to achieve quality than to try to control and sanction all producers who are not compliant with the quality standards. The combination of controlling produce

and controlling production practices is also recommended. With the agreement of the producers, random controls were conducted on 124 samples of vegetables from Dong Du commune (in August and November 2004, and June and August 2005), and 15 in Van Noi commune in June 2005. The samples were analyzed using a quick test (from the Taiwan Agricultural Research Institute) that determines excess organophosphorous and carbamate residues, which are from the most dangerous pesticides. Besides, 250 samples were collected in different Hanoi points of sale in 2005, and pesticide residues were analysed using quick test, as well as gaz chromatography in the case of detection of excess pesticide residues by quick test.

Main Results

I Consumers Seek a Variety of Fresh Produce

Surveys supervised by AVRDC confirm the importance of vegetables in the diet of people living in Hanoi: 92 kg per person per year in the municipality of Hanoi (98 kg in urban districts), much higher than the FAO recommendation of a minimum of 75 kg per person per year. Leafy vegetables lead consumption (52 percent for quantity). During the rainy season, the total quantity of vegetables consumed drops (by 11 percent compared to the average) and expenses increase (by 6 percent). The drop in tuber or root vegetables, cabbage and fruit vegetables is in part compensated by the increase in consumption of leafy vegetables[2].

In Vientiane, consumption is more limited (54 kg per person per year according to data supplied by Agrisud in 2002). Over half of the consumption is leafy vegetables along with tomatoes and cabbage. In Phnom Penh, consumption reached 109 kg per person per year in 2001 according to the Department of Agriculture (although this source has not been validated). The type of vegetables consumed is similar to the situation in Hanoi and Vientiane.

In Ho Chi Minh City, fish consumption is 34 kg per person per year based on the 2002 survey, made up of 15 kg of sea fish (mackerel, anchovies, tuna, etc.) and 14 kg of freshwater fish (snakehead catfish purchased alive, pangasius, red tilapia, etc.) and 5 kg of seafood. Fish consumption is very sensitive to the price of the fish and income level of the consumer[3].

For both vegetables and fish, in the four project cities, the main supply of fresh produce is the neighborhood retail market (less than 500 meters away), which may often be an informal market right on the street.

II Local and Regional Produce Supply Channels

A) Importance of peri-urban agriculture in the perishable vegetable supply

A study of the origin of produce on urban markets reveals a strong distinction according to the nature of the food items, and more particularly their perishability (Table 8, Table 9, Table 10). The majority of leafy vegetables are brought in from zones located less than 30 km from the urban center: water convolvulus, various types of cabbages and mustards, herbs, lettuce and green onions. These are the leading vegetables consumed, along with onions and tomatoes. They all have a very short shelf-life and their freshness drops considerably after just one day. Freshness is an important criterion in

[2] Mubarik Ali, Nguyen The Quan, Ngo Van Nam, 2006, An analysis of food demand patterns in Hanoi: predicting the structural and qualitative changes, AVRDC Technical Bulletin n°35, 61 p.

[3] Le Thanh Hung, et al.,2004. Consumer Behaviour Regarding Fish in Ho Chi Minh City RIFAV, Hanoi, http://www.avrdc.org/susper**,** 21 p.

consumer choice as refrigerators are a rare commodity. In Hanoi, in 2002, over 70 percent of leafy vegetables originate within a 30-km production radius from the city. Thus, 95 to 100 percent of lettuce comes from less than 20 km away, while 73 to 100 percent of water morning glory is grown within 10 km of the city[4]. In Phnom Penh, urban zones within the municipality supply the full lot of water morning glory marketed in Phnom Penh (2,000 tons a year), mainly in Dangkor and Mean Chey districts[5].

Table 8-Contribution of Various Peri-Urban Agricultural Products to City Food Supply

	Leafy vegetables	Tomatoes	Rice	All products
Perishability	→			
Hanoi (2002-2003)	70 percent	0 to 75 percent depending on season	56 percent[6]	44 percent (Ali,2004)
Vientiane (2002)	100 percent	20 to 100 percent depending on season	100 percent	
Phnom Penh (2002-2003)	100 percent (water morning glory)	0 to 50 percent depending on season	7 percent	

Table 9- Typology of Vegetables According to Origin in Phnom Penh

- Origin accounted for over 90 percent of supply channels in 2002 -

Vegetables from Phnom Penh	Vegetables from Kandal	Vegetables from Vietnam
0 to 20 kilometers	20 to 40 kilometers	400 kilometers
Water morning glory	Choy sum Lettuce Yard-long beans	Tomatoes (*) Cabbage Chinese cabbage

[4] Hoang Bang An, Isabelle Vagneron et al., 2003. Spatial and institutional organisation of the vegetable market in Hanoi. Hanoi, RIFAV, http://www.avrdc.org/susper, 75 p.

[5] Chhean Sokhen, Diep Kanika, et Paule Moustier, 2005. Vegetable market flows and chains in Phnom Penh, Hanoi, RIFAV, CIRAD, http://www.avrdc.org/susper, 50 p.

[6] Mai Thi Phuong Anh, Mubarik Ali, Hoang Lan Anh, et To Thi Thu Ha. 2004. Urban and Peri-urban Agriculture in Hanoi: Opportunities and Constraints for Safe and Sustainable Food Production. AVRDC Technical bulletin n°32, 66 pp.

Table 10 - Typology of Vegetables According to Origin in Vientiane[7]

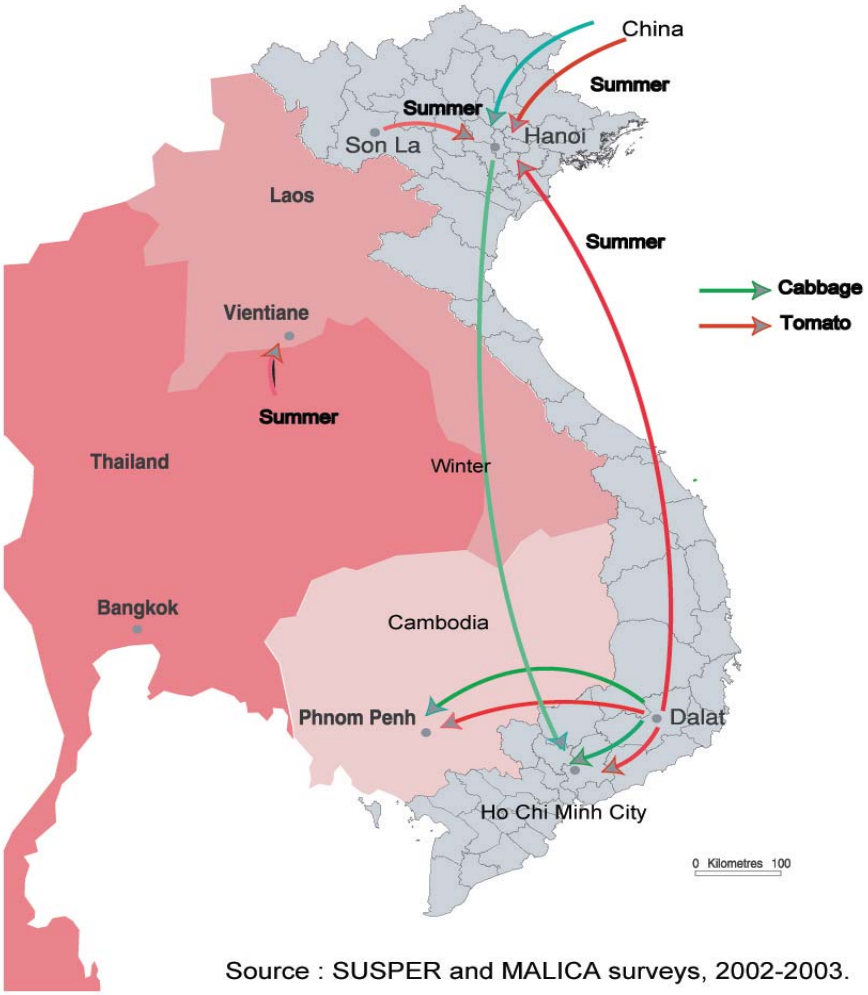
- Origin accounted for over 90 percent of supply channels in 2002 –

Vegetables from Vientiane	Vegetables from Thailand
0 to 30 kilometers	30 to 500 kilometers
Water morning glory Bok choy Chinese mustard Lettuce Eggplant	Tomatoes, kale and cucumbers (between July and September)

For less perishable vegetables such as tomatoes and cabbage that can be kept several days without spoiling, supply channels are divided between peri-urban and rural zones. Temperate zone vegetables are sensitive to climate variations. During the rainy season, it is not so much the distance as the sensitivity of the zone to rainfall and temperature that explains the supply zones. At certain times of the year, peri-urban agriculture is not sufficient to meet the needs of consumers, which is reflected by major price hikes and large amounts of imported produce. The complementary supply from rural agriculture is then crucial, all the more so since rural agriculture can offer specific comparative production advantages during certain periods. In Vietnam, peri-urban zones have a low production potential during the rainy season due to high temperatures and heavy rainfall that are conducive to physical damage and diseases. At such times the mountain zones of China, Dalat and Son La take over from local production. While 75 percent of tomatoes are grown within 30 km of Hanoi during the cold season, 80 percent of the tomatoes sold during the hot season come from China and 15 percent from Dalat, even though it is over 1,000 km south of Hanoi (see Map 1).

[7] Somsack Kethongsa, Khamthanh Thadavong, et Paule Moustier, 2004. Vegetable Marketing in Vientiane (Lao P.D.R.). Hanoi, RIFAV, CIRAD, http://www.avrdc.org/susper**,** 56 p.

Map 1-Regional Vegetable Supply Channels



Source : SUSPER and MALICA surveys, 2002-2003.

B) Short marketing chains

In Hanoi, over 40 percent of wholesale market sellers are producers; this proportion reaches 100 percent for water morning glory. Producers haul from 100 to 200 kilos a day, heaped onto bicycles or motorcycles, into the wholesale markets. Quantities produced in peri-urban zones are hauled over short distances often using non-powered means of transportation (carried on foot or by two-wheeled means of conveyance). This is a positive feature in terms of the final cost of the produce as well as impact on the environment. Thus, in Hanoi, all peri-urban production is hauled by two-wheeled vehicle (bicycle or motorcycle), while produce from China and Dalat is brought in by truck. Over 90 percent of water morning glory sold is grown in gardens within 20 kilometers of the city and brought in by bicycle.

In Phnom Penh, 57 percent of morning glory retailers get their supplies directly from farmers.

Short market chain for peri-urban vegetables

Farmer → (Collector) → Retailer → Consumer

For rural produce, the wholesaler/collector stage is far more systematic. In Vietnam, there is a wholesaler or collector stage for over 70 percent of transactions involving rural farm produce.

Long market chain for rural vegetables

Farmer → Wholesaler collector → Wholesaler distributor → Retailer → Consumer

In Vientiane, despite the short distance between the production zones and markets, the sales chains are quite complex. The combination of wholesale and retail functions is frequently observed (for over half of retail traders). Over 65 percent of the quantities marketed go through a go-between stage between the producer and retailer, even for a perishable vegetable such as water morning glory. This may be explained by the lack of a specific place for wholesale selling, which is handled at the same place as the retail selling, as well as by the low volumes marketed (less than 200 kg per day for wholesaler and retailer alike) and the means of transportation (tuktuk being the most common).

C) Advantage of Proximity—Freshness

In Hanoi, freshness is the key advantage for vegetable produce mentioned by 74 percent of the 500 households surveyed in 2003. In Vientiane, freshness is the key standard in selecting vegetables mentioned by the highest number of consumers (71 out of 100 consumers surveyed)[8].

D) Advantage of Proximity—Low Profit Margins

Research done by the Hanoi University of Agriculture (1998) assessed the marketing margin at 30 percent on leafy vegetables, 35 percent for cabbage and 75 percent for tomatoes[9]. CIRAD-VASI case studies (2002) identified margins of 45 to 50 percent for cabbage[10]. This data must be weighed carefully given the large price variations throughout the year. In long-distance supply channels, wholesaler income is 10 times higher than that of the producers, retailers or collectors, but the risks of failure are also much higher because of the irregularity of production and lack of arbitration structures in the event of conflict[11].

In Phnom Penh, urban farmers who sell water morning glory to retailers get over 50 percent of the final price[12], while tomato producers in Kandal (Mukh Kandal and Khsach Kandal districts), 10 or 20 kilometers outside of Phnom Penh who sell to collectors get 30 percent of the final price[13].

[8] Gerald E. Potutan, Kham Sanatem, Lynn G. Janubas, Robert J. Holmer, Wilfried H. Schnitzler, 1999. The status of vegetable consumption, production and marketing in Vientiane. Cgayan de Oro, Xavier University College of Agriculture, Periurban Vegetable Production Project, 84 p. + app.

[9] Bui Thi Gia, 1999. Vegetable production and marketing in Hanoi. In: Hanoi Agricultural University and HAU-JICA ERCB project, Agricultural products marketing in Japan and Vietnam, proceedings of the first joint workshop at faculty of economics and rural development, pp. 37-47.

[10] Ho Thanh Son, Bui Thi Thai et Paule Moustier, 2003. Strategies of stakeholders in vegetable commodity chain supplying Hanoi market. Hanoi, RIFAV, CIRAD, http://www.avrdc.org/susper, 50 p.

[11] Thai, B.T. 2000. Commercialisation des légumes d'hiver dans la zone de Bac Hung Hai. Programme Fleuve Rouge, INCO/VASI/GRET, Hanoi, 42 p.

[12] Chan Sipana et Paule Moustier, 2005. Socio-economic strategies and results of vegetable traders in Phnom Penh (Cambodia), Hanoi, RIFAV, CIRAD, http://www.avrdc.org/susper, 45 p.

[13] Chhean Sokhen et Meach Centmill. Tomato chain study in Phnom Penh. Internal document, Hanoi, CIRAD, 11 p.

E) Importance of regional trade and influencing factors (example of tomatoes)

1. Between Vietnam and China

According to information collected from the customs authorities and traders in the Long Bien market, fresh vegetable imports from China to Hanoi account for approximately 9,000 tons,[14] mainly tomatoes (3,500 tons[15]), cabbage (2,700 tons), the remainder including carrots, Chinese cabbage and various types of mustard. These imports take place between May and October, accounting for about 9 percent of the total volume of fresh vegetables consumed in Hanoi.[16]

China is the world's leading tomato producer, with 35 million tons in 2005/2006 (33 Mt in 2003).[17] Yunnan (Kunming province) is the source of the tomato production exported to Vietnam. In 2003, Yunnan's tomato production was reported to be 254,000 tons for 9,400 hectares of land area.

A comparison of tomato production in Vietnam (Ha Tay) and China (Kunming province, Tran Con district, Tan Thach commune) points up the following differences (see Table 11 and Figure 2):[18]

- Larger areas in China (total of 2,232 m² compared to the 1,530 m² in Vietnam; 1,340 m² for tomatoes compared to 670 m² in Vietnam)

- Higher yield in China (117 t/ha compared to 61 t/ha) due to the lower temperature and rainfall during flowering, as well as a higher yielding variety

All Vietnamese producers surveyed cite the climate as the main problem they face in production, because the heavy rains damage the fruit. Thuong Tin district was the only one where tomatoes were being grown at the time the survey was made. In China, five of the producers surveyed mentioned marketing problems, difficulties in finding purchasers and low prices; two mentioned that low temperatures drove up production costs as this phenomenon drags out the harvest period (one month in Vietnam compared to two in China) as well as time in the nursery (two months in China, a few weeks in Vietnam).

Longer production schedule in China: in Vietnam, June is the last harvesting month (for plants sown in January; the harvest lasts 25-30 days); in China, the plants are sown in November or December (the winter is colder in China and development time takes longer), harvesting starts in early May and concludes in late June. In villages other than the one surveyed, producers start the young plants later (between November and January) and can harvest during the April to October period. Collectors order tomatoes at different months of the year from producers in the different villages in order to benefit from a supply that stretches between May and October. The lower temperatures make tomato production difficult (especially maturation) between November and April.

Tomato varieties: in China, variety TF415 (hybrid variety produced in China, oval, 70-80 grams), and in Vietnam varieties of VL2000 (hybrid variety produced in Vietnam, round, 100 g) or VL2910 (hybrid variety of Vietnam, similar to China' TF415).

Quality: Tomatoes from China have a more pronounced color, are firmer and easier to transport than tomatoes produced in Vietnam.

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[14] Total volume of vegetables imported from China (including potatoes and onions) is approximately 94,000 tons.
[15] Total tomato exports from China to Vietnam reportedly amounted to 4,754 tons in 2004 (Gain Report, 2005 – see footnote 6.
[16] Data provided by AVRDC of 76 kg of fresh vegetables consumed per person per year (i.e. 98 kg less 22 kg of dry vegetables such as onions and potatoes), a population of 1.5 million persons in Hanoi's urban districts in 2002, and deducting 13 percent for consumption out of home and 1 percent for self-supply (production and gifts).
[17] The information that follows is excerpted from: Gain Report, 2005. China, People's Republic of, Tomatoes and Products Situation, USDA Foreign Agricultural Service, 16 p., www.fas.usda.gov/gainfiles/2004 et 2005, 13 p.
[18] Information from Vu Thi Tinh, report on tomato production in China and Vietnam, 2006, internal document, RIFAV.

The cost of production per unit of land is twice as high as in China, but since the yield is twice as high, the production cost per kilo is the same. This involves the cost of labor, fertilizer and other costs (such as stakes) that are higher in China. Costs of seed and insecticides are lower: firstly because industries that manufacture agriculture inputs are more present in China; secondly, producers watch for disease and avoid the use of excess pesticides. Moreover, the price to the producer is twice as low in China relative to Vietnam, so although the yield is twice as high, the producer's profit is the same.

Table 11 - Distribution of Costs and Prices in Tomato Market Chains in Vietnam and China Sent to Hanoi in June 2005

Note – 1 sao = 360m^2

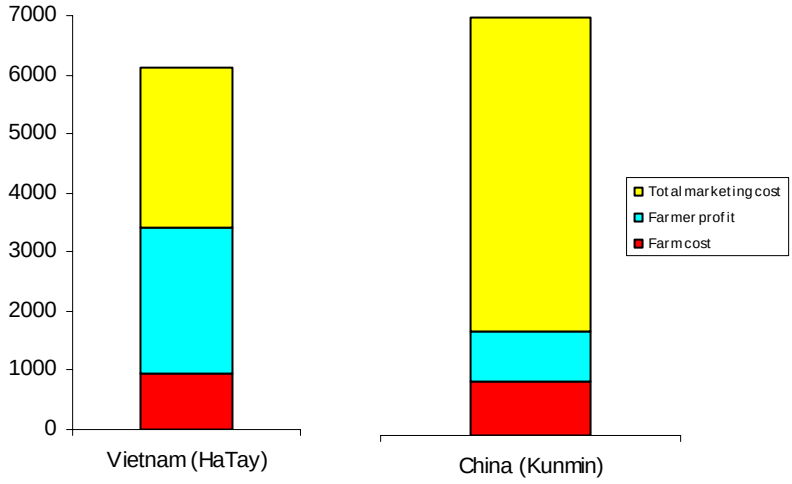
	VIETNAM		CHINA	
	VND/kilo	VND/sao	VND/kilo	VND/sao
Cost of labor	289	583,216	373	1,572,008
Cost of pesticide	232	469,656	110	465,405
Cost of fertilizer	224	451,784	192	810,894
Cost of seed	55	110,396	17	71,547
Other costs	138	279,357	181	758,368
Total production cost	938	1,894,409	873	3,678,223
Producer profit	2,462	4,232,370	827	2,396,179
Producer price	3,400	6,126,784	1,700	6,074,402
Total marketing cost	2,725		5,175	
Retail price	6,125		6,875	
Collector cost	147			
Collector profit	953			
Retailer cost	654			
Retailer profit	971			
Margin from collector to farm			408	
Cross-border collector cost			458	
Cross-border collector profit			492	
Wholesaler collector cost			474	
Wholesaler collector profit			593	
Wholesaler distributor cost			169	
Wholesaler distributor profit			831	
Retailer cost			821	
Retailer profit			929	

For tomatoes from China, marketing costs are logically higher than those for tomatoes from Vietnam, especially due to differences in the costs of transportation (189 VND/kilo for tomatoes from Vietnam, 612 VND/kilo for tomatoes from China), the larger number of go-betweens (4 instead of 2 between producer and retailer), as well as higher taxes (10 VND/kilo for the Vietnamese collector, 230 VND/kilo for the cross-border collector). Retailer costs are higher because the retailers are selling in markets with a more well-to-do customer base, which entails higher rental costs and taxes.

The three traders surveyed selling tomatoes from both sources indicated that tomatoes from China have a more uniform appearance and keep longer.

In both types of market chain, the relationships among the stakeholders are personalized and regular.

Figure 2- Distribution of Costs and Prices in Vietnamese and Chinese Tomato Market Chains Destined to Hanoi in June 2005 (equivalent in VND/kilo)



2. Between Cambodia and Vietnam

In Phnom Penh, for the eight selected vegetables that account for approximately 40 percent of the total consumed, 32,800 tons are sold, including 12,800 tons that are imported (i.e. 39 percent) and 16,400 tons (61 percent) that are local.

Comparison of tomato production in Cambodia (Kandal province) and Vietnam (Dalat) shows the following differences[19]:

- Area: 5,800 m² of tomatoes on the average in Cambodia (36 percent of total area).

- Production schedule: In Cambodia, tomato production takes place mainly during the dry season, from November to April. At the end of the dry season, from January to April, production is difficult, as well as during the rainy season (May to October). At the end of the dry season, tomatoes are produced in Kien Svay, Mukh Kandal and Khsach Kandal districts because of the proximity of water sources.

In Dalat, the main production season is from October to April.

Yield: The yield is 8 tons/hectare on the average in Cambodia. The lowest is 6.5 and highest 22.7 tons. This high figure is achieved with greater use of fertilizer and more costly pesticides.

In Dalat, the yield is 175 tons per hectare for one producer surveyed. The production cost is 73,500,000 VND/ha. The tomatoes are first shipped to Ho Chi Minh City, then from Ho Chi Minh City to the border by collectors, and are then delivered to wholesalers in Phnom Penh.

In Cambodia, labor costs include weeding, plowing and harvesting that are paid out as service provisions. Depreciation applies mostly to spraying equipment (owned by 7 producers out of 10) and motor pumps (2 producers out of ten).

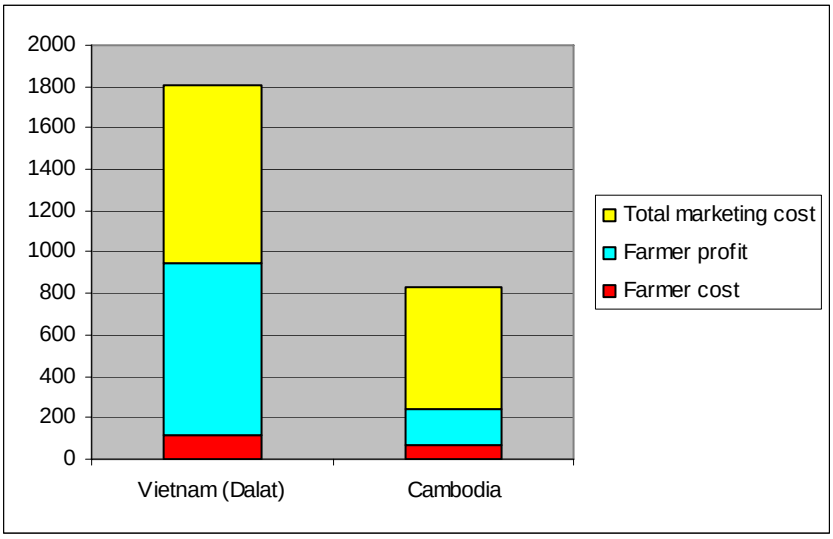
The distribution of Costs and Prices in the Cambodia and Vietnam Tomato Chain Sent to Phnom Penh in March 2006 is indicated in Table 12 and **Figure 3**.

[19] Chhean Sokhen and Meach Centmil. 2006. Tomato chain study in Cambodia. SUSPER internal document, 6 p.; data on the tomato chain in Dalat was collected by Boun-Tieng Ly.

Table 12- Distribution of Costs and Prices in the Cambodia and Vietnam Tomato Chain Sent to Phnom Penh in March 2006 (equivalent in Riels/kilo)

	CAMBODIA	VIETNAM
	Riels/kilo	Riels/kilo
Cost of labor	28	
Cost of pesticide	4	
Cost of fertilizer	8	
Cost of seed	3	
Equipment depreciation	17	
Other costs	4	
Total production cost	64	116
Producer profit	173	834
Producer price	237	950
Total marketing cost	591	855
Retail price	828	1,805
Collector cost	85	100
Collector profit	82	
Wholesaler cost	42	350
Wholesaler profit	83	
Retailer cost	93	131
Retailer profit	206	149

Figure 3- Distribution of Costs and Prices in the Cambodia and Vietnam Tomato Chain Sent to Phnom Penh in March 2006 (equivalent in Riels/kilo)



In both types of market chain, the relationships between the stakeholders are personalized and regular.

F) Market information and consultation systems

The operation of the market information system has been presented in the section on methodology. The main results related to the use and to the impact of the system are summarized below[20].

In the first two years of the project, we helped farmers, as well as development and research agents, to make medium-term decisions on production sites, commodities, and cropping periods, through the gathering of information on market seasonality and product origin. This contributed to the selection of the project sites by taking into account their importance and continuity in urban food supply:

1. in Hanoi, Dong Du commune (Gia Lam district) as regards the supply of aromatic herbs and cabbage,Tien Phong (Me Linh) as regards tomato supply from November until June, Tien Duong (Dong Anh) as regards tomato and choysum supply, Vo Cuong (Bac Ninh), as regards tomato supply[21].
2. for Phnom Penh, Kien Svay and Saang districts in Kandal Province
3. in Vientiane, Sikkotabong district, with diversified leafy and fruit-vegetable production.

While the imports from neighbouring countries are considered to hinder the development of local production because of "dumping prices", the workshops in the three countries have resulted in reaching a consensus between farmers, traders, and research agents on the possibility for local production to substitute for imports if the following strategies are pursued: (i) targeting some specific products, including tomato in the three countries, at specific times of the year (including the rainy season, from June to November, in the three countries); (ii) applying off-season production techniques, including grafted tomato and seed varieties adapted to bacterial wilt; (iii) adapting the visual quality of vegetables to the needs of the consumers in line with the imported products, e.g., in Hanoi, developing the production of cabbage of small size (similar to the one from China), which has higher price per kilo than the bigger cabbage. Diversification strategies have also been discussed in Vientiane, including Chinese cabbage in the dry season, and also peppermint and eggplant at the beginning of the rainy season[22].

The demand for information on daily vegetable wholesale and retail prices was quoted the most often by farmers and traders in the stakeholders' workshops held in Hanoi and Phnom Penh, for the following uses: targeting periods of high prices in terms of cultivation and harvest (same purpose for calendar data) and better negotiation with traders. The preferred means of dissemination by farmers is television in Vietnam and radio in Cambodia. In the three countries, vegetable exchange is characterized by a combination of spot, small-scale, occasional interactions, and regular relationships, but without rigid commitments in terms of priority sales, volume or pricing, so the margin of manoeuvre to use market information in the negotiation with traders and the choice of markets is quite high.

The impact survey of Hanoi vegetable price information system set by Susper demonstrates that a majority (74%) of farmers and traders have now access to vegetable price information through television (where vegetable prices are communicated by Susper). They listen to the television programme on prices everyday (62%) or several times a week (25%). The price information is used for marketing decisions, especially for bargaining with their buyers, and also for crop planning purposes. The actors not using vegetable price data are characterised by a low area for production (less than 700 m²) and regular relationships with the buyers. Farmers recommend having price information disseminated everyday at 7:30 p.m. (rather than 6:30 p.m.). This needs to be discussed with HTV2, as this time of the day is in high demand by television broadcasters.

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[20] See Hoang Bang An and Paule Moustier, 2006. Vegetable market information and consultation systems in the Mekong region. RIFAV, Hanoi, http://www.avrdc.org/susper, 191 p.

[21] See Mai Thi Phuong Anh, Nguyen Thi Tan Loc, Le Nhu Thinh, Ho Thanh Son and Paule Moustier, 2004. Basic information on the project sites in Hanoi peri-urban areas, http://www.avrdc.org/susper, 24 p.

[22] J.F. Lecoq, 2003. Negotiation tools for vegetable commodity chains in Vientiane, http://www.avrdc.org/susper, 21 p., 2003.

According to ICARD, the Ministry of Agriculture could be in a position to fund the system in 2007.

In Phnom Penh, the interviewed farmers declared that they need daily vegetable price information on radio. This is already implemented by the Agricultural Marketing Office, but it is little known by farmers, and the reliability of the data needs to be improved by more rigour in price collection, e.g., as regards quality grading.

II. Promotion of Vegetable Safety

A) Diagnosis of supply and demand for vegetable safety

1. Increasing demand for vegetable safety

For 90 percent of the 200 households, the vegetable safety of vegetables has dropped over the last ten years. They feel that vegetables are a greater source of concern in terms of health mainly due to pesticide use[23].

In Phnom Penh and Vientiane, the traders surveyed say they prefer to buy local produce rather than imported produce because the latter enjoys a reputation of being safer (with less chemical residues) and so is easier for consumers to purchase.

2. Actual instances of contamination

In Hanoi, banned pesticides such as Wotafox and Monitor were found to be used by farmers in Tu Liem district. Various vegetable samples were analyzed in peri-urban co-ops between 1994 and 1995 and showed excesses of nitrates and pesticides in relation to authorized standards.[24]

In 2004, quick tests conducted by SUSPER on 25 vegetable samples from Phnom Penh retail markets and 30 from retail markets in Vientiane revealed excess pesticide residues on samples of cabbage imported from Vietnam and on peri-urban leafy cabbage (in Phnom Penh), as well as on Chinese cabbage imported from Thailand into Laos.

In Hanoi, analyses conducted by SUSPER in 2006 at various points of retail sales revealed that out of 250 samples, 9 percent had higher than standard pesticide residues, especially leafy cabbage types of peri-urban origin[25].

In Phnom Penh, the SUSPER project conducted heavy metal analyses of water morning glory grown in Boeng Ansaong Andaet, a wastewater collection pond south of Phnom Penh (samples were sent to the Ho Chi Minh City University of Agriculture laboratory). The analyses found zinc residues to be eight times higher than the FAO standard.[26]

In 2003, analyses conducted on fish raised around Ho Chi Minh City revealed excess levels of arsenic in An Lac village, located in an industrial zone, and zinc, for carp and tilapia (Hung, 2004).

3. Difficulties in recognizing quality

In 1995, public interest in the issue of vegetable health quality led the government of Vietnam to conduct an ambitious program on “safe vegetable” theme. By 2001, this program covered 30 percent of the land under vegetable cultivation around Hanoi (2,250 hectares). It included training in proper use of fertilizers, pesticides and water. Production certificates were issued by the City of Hanoi Department of

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[23] Muriel Figuié, 2003. Vegetable Consumption Behaviour in Vietnam. Hanoi, CIRAD, http://www.avrdc.org/susper, 23 p.

[24] Tran Khac Thi 1999. Study on some environmental factors and solutions on safe vegetable development. Paper presented at the National Workshop on Safe and Year-round Vegetable Production in Peri-urban Areas, CIRAD/RIFAV Hanoi, 15-16 December, pp. 33-47. Unfortunately, the method used to collect and analyze samples, as well as the proportion of samples with excess residue levels, is not outlined in a precise manner.

[25] Nguyen Kim Chien and Paule Moustier, 2006. Vegetable Pesticide Residues in Selected Fields and Points of Sale. Internal Susper document.

[26] Internal document prepared by Boun-Tieng Ly.

Science and Technology to cooperatives involved in this program. Also, a network of "safe vegetable" outlets was established for the distribution of vegetables produced by these cooperatives. In parallel, organic vegetable production started in 1999 at the incentive of an NGO (CIDSE).

Producers selling their vegetables under the "safe" or "organic vegetable" label can get a price 50 to 100 percent higher than for conventional production (Son, Hung Anh and Moustier, infra). However, the share of vegetables sold as "safe vegetables" or "organic vegetables" accounted for 2,200 tons in 2002 (including only about 40 tons of organic vegetables), which is less than 5 percent of household consumption in the capital and less than 2 percent of production in the municipality of Hanoi. Thus, producers who put forth a genuine effort for quality production have only limited recognition on the market. Furthermore, vegetable safety control is difficult to put in place. Firstly, production around Hanoi is widely dispersed: over 10,000 producers on land areas under 1,000 m². Secondly, there are many government laboratories in competition with one another. And finally, the cost of analysis is very high (US$20 per sample for gas chromatographic analysis).

4. Organization of market chains for quality produce

Supermarkets that want to get supplies of specified quality produce go to chains that are more integrated than those supplying retail traders in market stalls. Thus, in Hanoi, supermarkets, stores, schools and restaurants are supplied directly by a small number of co-ops (three main ones in 2003, that represent about thirty hectares altogether), with which they have a customer fidelity relationship. These co-ops have the technical support of "safe vegetable" programs sponsored by agriculture departments of the municipality of Hanoi (non-chemical agriculture practices) and a certificate issued by the Department of Science and Technology (but obsolete since 2001, and gradually re-implemented by the Department of Plant Protection since 2004).[27]

Proximity between production zones and the markets enables producers to make retail sales directly to consumers, which is a noteworthy guarantee of quality due to the information exchange and trust developed between producers and consumers (see the cases of the Van Tri co-op and Dong Du co-op in section 2).

The organic vegetable chain has developed due to the impetus of a non-governmental organization (CIDSE) and now involves about 30 families in the municipality of Hanoi (Tu Liem) and in Ha Tay (Chung My). Until 2004, the NGO entered into contracts with producers for a three-month term based on fixed prices and quantities. It provided them with organic fertilizer and technical training. Since some producers have problems finding outlets, the NGO has also gotten involved in retail marketing by supporting a private company (Hanoi Organics) that has opened a store and makes private deliveries. The "safe vegetable" chain in Dalat has a similar organization. It is led by the Golden Garden Company that is bound by contract to the Safe Vegetable Producers' Association which has 35 members working 4 hectares[28]

It is noteworthy that the analysis of pesticide residues in different points of sale in 2005 (Chien and Moustier) showed that the percentage of samples with excess residues is increasing from the organic vegetable shop (no excess residue), to the safe vegetable shops and supermarkets (1.5%), up to the traditional markets (10%).

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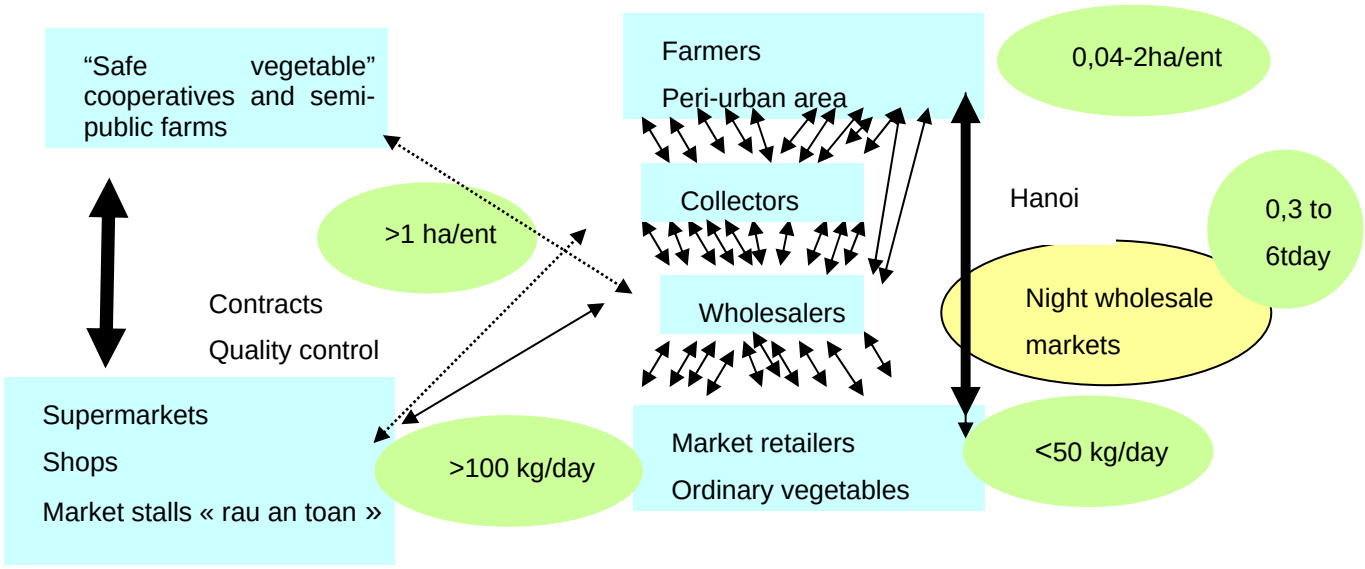
[27] See Moustier, P., Figuié, M., Nguyen Thi Tan Loc and Ho Thanh Son. 2005. The role of coordination in the safe and organic vegetable chains supplying Hanoi. 2006. In Acta Horticulturae, (699), pp 297-303

[28] Dini, L. 2002. *La gestion de la qualité sanitaire dans la filière des légumes à Hanoi* (Health Quality Management in Hanoi Vegetable Supply Chains). Master's degree thesis, CNEARC/CIRAD, Montpellier.

Figure 4-Organization of "Safe Vegetable" and "Ordinary Vegetable" Supply Chains in Hanoi



5. Consultation workshops focusing on quality

Two stakeholders' workshops were held in Hanoi to deal with health quality problems in vegetable market chains. The first was held on June 17, 2003 at RIFAV. It was attended by 6 co-op management staff (including 2 for safe vegetables and 3 from three project sites), 4 collectors from project sites, 3 retailers (one for safe vegetables and one for organic vegetables, one regular vegetable retailer), two representatives from the consumers' association, three journalists, three government representatives and ten researchers. This workshop enabled an assessment to be made of the supply and demand situation in the realm of vegetable safety based on the findings made by SUSPER. A consensus was reached around two priorities to improve the match: (i) communication on efforts put forth by producers to achieve quality; (ii) vegetable safety control. Each of these themes was covered by working groups who made some recommendations[29]:

(i) Communication on efforts put forth by producers to achieve quality: consumer information on origin of vegetables, points of sale, health quality features

(i) Vegetable safety control: This control must be low cost and flexible, based on internal control in the co-ops themselves. Direct sale of vegetables to consumers also makes it easier for consumers to check production conditions.

A second workshop was held at Dong Du, one of the project sites, on October 20, 2003. The meeting was attended by 64 producers, 2 co-op representatives, 3 commune representatives, one vegetable collector from Dong Du, a "safe vegetable" outlet operator, one supermarket operator, IPM project officers (ADDA) and 9 researchers. During this meeting, the "safe vegetable" production situation in Dong Du was outlined, as well as difficulties experienced by traders and consumers to find a regular

[29] A summary of this workshop was prepared for *Consumer* magazine: Nguyen Thi Tan Loc, Muriel Figuié and Paule Moustier, 2003, *Gap go giua cac nha san xuat, buon ban va tieu dung voi cac nha nghien cuu rau* (Meeting of vegetable researchers with farmers, traders and consumers), *Nguoi Tieu Dung* n° 137, p. 1.

supply of “safe vegetables”. Traders get their supplies mainly from Van Noi cooperatives but would like to diversify their supply sources. Producers were informed of potential points of sale for “safe vegetables” as well as of consumer and trader demands regarding labeling and quality certification. Producers from Dong Du prefer direct sales to consumers and contracts with restaurants rather than sales to retail traders, because they fear they cannot meet the requirements for diversity and regularity voiced by the retail traders.

6. Status of quality promotion for two safe vegetable co-ops: Dong Du and Van Noi

Two communes where safe vegetables are produced were selected for the particular purpose of vegetable safety promotion: Dong Du (Gia Lam district) and Van Noi (Dong Anh district). They belong to the group of 33 communes involved in the 1996 “safe vegetable” program. We selected co-ops that were already applying the “safe vegetable” specifications in order to improve the thoroughness of quality control practices.

Stock was first of all taken of the production situation and marketing in both communes.[30]

Dong Du

“Safe vegetable” production involves 30 hectares of vegetables in the summer (40 hectares in winter) and 70 households organized in 5 groups. Total yearly output of these groups is estimated at 1,900 tons, and 5 billions of VND (310,000 dollars). From 2001 to 2002, ADDA (an NGO) held classes on safe vegetable production (12 courses with 30 participants per course). A similar number of training sessions had been held previously from 1996 to 2001 by departments under the People’s Committee. The group leaders stated that they perform weekly controls of practices involving the use of chemicals in the fields and in outlets selling agriculture inputs.

The main avenue in which vegetables are sold is right in the field to collectors (for aromatic vegetables) or in wholesale or retail markets in neighboring villages. A small share of the production is also sold under contract to two factory canteens (total of 500 kg/day). In 2002, Japanese Cooperation funded the rental of a stand in Hang Da Market but the co-op was subsequently unable to pay the rent and preferred to rent a stand in Gia Lam Market starting in 2004. The average quantities sold by the shop amount to 70 kilos per day (25 tons par year).

Van Noi

The Van Tri cooperative in Van Noi commune is a noteworthy example of successful collective action and vertical integration into the market chain. It is made up of 13 members who work 3 hectares and produce about 100 tons of vegetables per year. In addition to what its members produce, it makes off-season purchases of vegetables from Moc Chau producers. It exercises control over the Moc Chau production by renting land from owners on which the farmers work rent-free for 5 years and who are subject to technical control by the owners. In exchange, they receive a commission of 5 percent on the sale of vegetables. In 2004, vegetables from the co-op were being retailed through 10 points of sale, each of which was managed by a co-op member (who makes purchases from other members as well as from the Moc Chau co-op in addition to its own production), thus clearing an average of 200 kg of

[30] By Nguyen Thi Tan Loc, RIFAV, for Dong Du, and Ho Thanh Son, ASD-VASI for Van Noi.

vegetables per day. The co-op is also selling vegetables to two supermarkets, four schools and five restaurants, with which it enjoys a customer fidelity relationship (Ho Thanh Son, 2004).[31]

Surveys of production practices were conducted with 30 households belonging to three co-ops in Van Tri village. The type of manure, fertilizer, pesticides, as well as the time between their use and harvesting were compared with standards, on the basis of statements made by the producers. This survey indicated good compliance (according to the farmers' statements) with production standards, which shows at least that they are familiar with them, although it would be difficult to actually check things out. However, for some vegetables (such as Chinese peas), the times between pesticide spraying and harvest are one day shorter than the recommended times. The recommended times are complied with for tomatoes and cabbage.

B) Improvement of communication on efforts to achieve quality (Hanoi)

In January 2003, a TV program was prepared with the VTV2 channel. The first part was devoted to consumer demands for vegetable quality and the organization of existing market chains for "safe" and organic vegetables. The program was designed for an audience of consumers, producers and government officials. The second part was directed to producers, showing various techniques of growing leafy vegetables under nets.

In 2003 as well, an article was written and published in *Consumer* magazine regarding various points of sale for safe vegetables in Hanoi.[32]

Many things have also been done with the Dong Du co-op in order to improve information supplied to consumers by this co-op regarding quality efforts:

- A newsletter outlining commitments made by the co-op in the area of safe vegetable production as well as the various types of vegetables available at the co-op during particular seasons. Over 1,500 copies of this newsletter were distributed, notably during three "safe vegetable" fairs held in 2003 by the Hanoi People's Committee. These fairs involved some 50 exhibitors on the "safe vegetable" theme (most of which were production businesses);

- An information board in the Gia Lam Market store presenting information similar to that covered in the newsletter;

- Plastic wrapping and labeling of vegetables sold at the retail level, showing the address of the co-op, telephone number and "safe" production method (see label in annex). However, packaging and labeling are not carried out systematically because some consumers prefer to buy vegetables in bulk.

These steps taken in 2003 and 2004 enabled the co-op to get a contract in 2003 with an exporter of aromatic herbs for three deliveries per week, 300 kg at a time, with a turnover of 300,000 to 400,000 VND per delivery. Besides, sales in the shop increased from 70 kg to 100 kg per day (i.e., by 30%), while returns increased from 150,000 to 200,000 VND per day.

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[31] Ho Thanh Son, 2004. *Organisation de la production et de l'écoulement des produits de légumes Van Tri-Van Noi-Dong Anh-ville de Hanoi* (Organization of Vegetable Production and Marketing from Van Tri-Van Noi-Dong Anh to Hanoi City). Internal document, SUSPER, AVRDC/CIRAD, Hanoi, 11 p.

[32] Nguyen Thi Tan Loc and Paule Moustier, 2003. *Nguoi Hanoi mua rau an toan o dau?* (Where Do People in Hanoi Buy Safe Vegetables?). *Nguoi tieu dung*, April 2003, p.4.

C) Support for quality control

Support for quality control is provided in co-ops in Dong Du and Van Noi communes. Random sample collections of vegetables yielded the following results:

Dong Du:

- In August and November 2004, 8 percent of samples (out of 61) were found to contain pesticide residues (involving three aromatic herbs). After these analyses were performed, discussions took place with co-op management staff, which revealed that too little time was allowed between spraying and harvesting, and the practices were subsequently corrected.

- In June 2005, excesses were found in three types of aromatic vegetables (33 percent of samples out of a total of 33). Subsequent to these analyses, discussions took place with co-op management staff, which revealed that too little time was allowed between spraying and harvesting, likewise resulting in a correction of the practices. No residue was found in August 2005.

In Van Noi (Thon Dam village, Van Noi co-op), analyses performed in June 2005 on 15 samples showed that 80 percent of samples had excessively high residue levels. The results were forwarded to the co-op management staff and further analyses were performed with the Department of Plant Protection. Results are not yet available.

D) Certification in Dong Du

The project assisted the Dong Du co-op to go through the different procedures required to obtain a certificate from the Department of Plant Protection:

- Compilation of documents on the IPM training sessions received, a letter of commitment to comply with the “safe vegetable” standards, outlets selling agriculture inputs along with a list of the products sold, type of marketing, map of the production zone showing among other things the location in relation to water sources.

- Random controls with three samples of vegetables, soil and water collected and analyzed:

- For vegetables: nitrates, 7 types of pesticide, 6 types of heavy metal, 3 types of pathogen

- For soil, nitrates, 4 types of pesticide, 6 types of heavy metal

- For water, 6 types of heavy metal, 3 types of pathogen.

Out of a total cost of US$ 400 (6.6 M VND) (for 12.8-hectare area), the municipality of Hanoi provided funding at a level of US$ 240 (3.8 M VND), the co-op US$ 80 (1.2 M VND), and the SUSPER project US$ 100 (1.6 M VND). The co-op received a certificate on December 20, 2005 for a 1.28-ha area, involving a village of 24 producers. In the other villages, the group leaders do not want to be bothered with administrative procedures. Pressure from the Department of Plant Protection as well as that from purchasers is indeed limited (purchasers do not check to see if vegetables come from the area specified on the certificate).

The certificate is to be renewed yearly. In the course of the year, in June 2006, a representative from the Department of Plant Protection visited the fields to check on practices involving the use of chemicals as well as products available in outlets selling agriculture inputs. The co-op was informed in advance that this check would take place, but not the producers.

The co-op would like to renew the certificate in late 2006 at a cost of US$ 62 (1 M VND). Certificate renewal undergoes the same analysis of plants, soil and water as for the first time it is obtained, and also includes a visit of the fields and outlets.

Conclusions

The SUSPER project contributed to the capacity building of staff in Vietnamese research institutes and government offices in the area of market analysis. It also increased regional cooperation on this subject and highlighted the dynamics of the regional vegetable trade between Vietnam, Laos and Cambodia. The strong consumer demand for certified safe vegetables was highlighted and passed on to producer groups. The periods and items of produce that command the highest prices were also shared with these groups. An inexpensive system for daily price information collection and dissemination was developed in order to facilitate producer negotiation with traders. New methods of labeling and certifying the health quality of vegetables were also tested.

The findings regarding the produce market supply channels made it possible to guide the selection of production zones for the other project components, given their importance and continuity in supplying the city. These findings also make available quantified data on the role of peri-urban zones in terms of supplying city dwellers with fresh produce, especially leafy vegetables. These findings are of particular interest to persons in charge of urban planning in Hanoi and Phnom Penh (Municipality Urban Affairs Office).

Follow-up actions are shown below:

- Plans call for ICARD to continue the daily price information system (potentially with the support of the ADB);

- Continuation of produce labeling and certification in 2006 supported by MALICA (Markets and Agriculture Linkages for Cities in Asia), a consortium between CIRAD, VAAS (Vietnam Academy of Agriculture Science) and IPSARD (Institute on Policy and Strategies on Agriculture and Rural Development)), in cooperation with the ADB/DFID project “Making Markets Work Better for the Poor”.

In all three countries, the emphasis that the project placed on transferring research and intervention methods through workshops and publications is something that will ensure the sustainability of most of the undertakings, although funding must be found in order to increase the scale.

SUSPER

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- Ministry of Agriculture, Forestry & Fisheries, Kingdom of Cambodia
- Research Institute of Fruit and Vegetable (RIFAV), Vietnam
- University of Agriculture and Forestry (UAF), HCMC, Vietnam
- Markets and Agriculture Linkages for Cities in Asia