

Production and Consumption Efficiency and Measures to Develop Safe Vegetable Market in the Mekong Delta

by Dr. LƯU THANH ĐỨC HẢI

1. Problem

Vegetables are used as daily food and a source of fresh vitamins and minerals needed for human body. As the economy grows, demand for vegetables in terms of both quality and quantity tends to increase. In recent years, however, unselected application of technical advances to production of vegetables has polluted part of vegetables supplied to the market. In Vietnam, getting poisoned or even killed by vegetables takes place every month, week and even day. According to a rough estimate, some 7% of vegetables supplied to the market didn't meet standard for pesticide residue (test of random samples conducted by HCMC Agency of Crop Protection). This means that each resident consumes some 50 meals a year with vegetables in which the pesticide residue surpassed the limit (MRL). That is why production and distribution of safe vegetables becomes a matter of great urgency to Vietnam and the world as well.

Mekong Delta provinces have favorable condition for production of vegetables, especially the safe ones, and satisfaction of demand from residents, restaurants and hotels in big cities. An overall estimation of production and consumption of vegetables in general, and safe ones in particular, at present, and their prospects reveals many problems to deal with.

- Market demand for vegetables and safe vegetables is on the increase while they are produced according to traditional methods, peasants can use pesticides and fertilizers at will and quality of their produce is not tested and checked before sale, which leads to many cases of poisoning.

- The environment of vegetable growing areas has been polluted by untreated industrial and household waste and effluent. Careless use of pesticides leaves high degrees of residue in agricultural produce. All of them are causes of poisoning.

- Sellers of vegetables can't anticipate who are

their buyers and what prices they can demand while buyers of vegetables can't know if what they buy is safe enough. State control over distribution network for vegetables is not strict enough. Many traders label vegetables with no clear origins as safe vegetables to make profit.

- How to help growers of safe vegetables in the Mekong Delta sell their produce and link them with consumers in a well-controlled distribution network are topical issues today.

With such problems, a careful study of production of safe vegetables, and analyses of structure of market; policies; mechanism for controlling the trade in vegetables; interactive relations between production and distribution of vegetables that are staple products from the Mekong Delta are very necessary. This paper presents results of a study that aims at building a model linking production with consumption of safe vegetables, developing suitable marketing strategy, and find optimal measures to distribute safe vegetables thereby ensuring interests for peasants, traders and trade associations and consumers.

2. Objectives

- Analyzing production of staple vegetables in the Mekong Delta regarding its size, product quality, economic efficiency, and adjustability to changes in the market demand, thereby suggesting a new model of the system of vegetable production.

- Examining consumption of the vegetables in the Delta regarding distribution channels and its efficiency with a view to suggesting a model of connection between production and consumption of safe vegetables.

- Suggesting measures to improve production and consumption efficiency, such as building an optimal model of production, improving the distribution networks, introducing trade promotion mix, and forming cooperative organizations and trade associa-

tions needed for a more effective distribution.

3. Methodology

- Analyzing secondary data relating to production and distribution of vegetables in the Mekong Delta.

- Conducting field surveys to gather first-hand data by interviewing participants in the trade in vegetables. Data is gathered from such key provinces as An Giang, Cần Thơ, Sóc Trăng, Vĩnh Long and Tiền Giang.

- Analyzing criteria for assessing production and distribution efficiencies: production costs, marketing cost, marginal marketing and profits for each participant in the value chain.

- Analyzing market structure and existing distribution network, and developing a more reasonable network to meet the market demand better.

4. Production of safe vegetable in the Mekong Delta

a. Area, output, productivity and staple vegetables:

In recent years, area of vegetables in the Mekong Delta has increased quickly due to favorable natural and climatic conditions. The Delta has become the leading supplier of vegetable of the country but the production here serves mainly the domestic market.

Up to 2007, the vegetable area in the Mekong Delta amounted to 188.5 hectares with a total output of 4,080,000 tonnes. When the area rose 13,000 hectares over 2006 (or 7.9%), the output increased 300,000 tonnes (or 7.94%) and this means the yield experienced no change. The main cause of this situation is the fact that vegetable cooperatives started introducing new technical advances and new production models in 2006 – 07 with support from local authorities.

The area of safe vegetable in the Delta, in fact, is not large enough. The highest area, found in Vĩnh Long, is 1,012 ha equaling 55.2% of the total area in the Delta. This area, however, is distributed among many districts: for example the Cooperative Thạnh Lợi – Bình Tân has only 27 ha for safe vegetables and

Cooperative Phước Hậu – Long Hồ 175 ha. The size of production is limited to family businesses and teams of peasants or, at a larger scale, cooperatives. In Long Xuyên (An Giang Province), where vegetable production has a long tradition, the vegetable area has been contracted recently. The situation was improved slightly in 2007 when seven vegetable cooperatives came into being.

Many efforts have been made to encourage peasants to grow safe vegetables but they only produce good results in Vĩnh Long, Cần Thơ, Tiền Giang, Long An and An Giang. In other provinces they are limited to pilot schemes at small scale.

Various kinds of vegetables can be grown in the Delta and they could be divided into three groups:

- Leaf vegetables: Mustard leaves, Chinese flowering cabbage, Chinese cabbage, white cabbage, lettuce, slender amaranth, star gooseberry, jute mallow, and water spinach, etc.

- Spicy vegetables: These vegetables make dishes more colorful and attractive, and add some fragrant from their aroma. Most spicy vegetables can limit bacterial growth. The most common spicy vegetables in the Delta are coriander, herb mint, perilla, water pepper, onion, garlic, long pepper, lizardtail, galangal, and ginger, etc.

- Others: Cabbage, cauliflower, beans, cucumber, bitter melon, luffa, radish, calabash gourd, winter melon, tomato, Thai brinjal, and chili, etc.

Safe vegetables are diverse enough but the production is totally based on wishes of producers instead of the market demand with the result that the economic efficiency is not high though the produce is sold out.

b. Estimate of efficiency of safe vegetable production:

In producing safe vegetable, peasants can reduce the production cost by using fertilizers and pesticides more reasonably. The average production cost is VND17.9 million a crop per hectare. Of this expense,

Table 1: Area and output of safe vegetables in the Mekong Delta

Indicator	2005	2006	2007	2006/2005		2007/2006	
				Difference	%	Difference	%
Area (1,000 ha)	164,3	174,7	188,5	10,4	6,33	13,8	7,90
Output (1,000 tonnes)	2.732,6	3780	4.080	1.047,4	38,33	300	7,94
Yield (tonne/ha)	16,63	21,64	21,64	5,01	30,13	0	0

Source: General Bureau of Statistics, 2007

pesticide accounts for 1.2 million, or 6.5% compared with 11.5% when producing with traditional methods. The production cost of safe vegetable is from 10% to 15% lower than that of traditional vegetables because the fertilizer is cut by a third or a half and replaced partly by manure. IPM and other biological techniques can also help reduce the production cost.

My field survey shows that the production of safe vegetables on a hectare brings peasants in VND160 million a year on average. The economic efficiency of safe vegetables is from 1.2 to 1.7 times higher than that of normal vegetables. The average income of a household producing the safe vegetables varies from VND60 to 100 million a year for a hectare. The

Table 2: Leading vegetable producing districts in the Delta

Province	Production size	Area (ha)	Method	Staple products
1. Cần Thơ City		225		
- Bình Thủy District	1 Co-op & teams of peasants	17	Specialized and diversified farming	Seasonal: Largely water melon and leaf vegetables
- Cái Răng District	Teams of peasants & individuals	150	Specialized and diversified farming	kohlrabi, cabbage, winter melon, leaf vegetables
- Other districts	Teams of peasants & individuals	58	Specialized and diversified farming	leaf vegetables, spices, tuber vegetables, etc
2. Tiền Giang Province		494.58		
- Tân Mỹ Chánh Commune (Mỹ Tho Town)	1 Co-op	85	Specialized farming	cabbage, tomato, pea, kohlrabi, etc
- Long Hòa Commune (Gò Công Town)	1 Co-op	15	Specialized and diversified farming	mustard leaves, pea, tomato, cabbage, water spinach
- Thân Cửu Nghĩa Commune (Châu Thành District)	1 Co-op	8.5	Specialized farming	spicy vegetables
- Other districts	Teams of peasants & individuals	377.08	Specialized and diversified farming	leaf and tuber vegetables, spices ...
3. Vĩnh Long		1,012		
- Vĩnh Long Town	Teams of peasants & individuals	04	Specialized and diversified farming	water spinach, star gooseberry, spinach, winter melon...
- Long Hồ District	1 Co-op Family business	25 150	Specialized and diversified farming	cauliflower, tomato, water spinach, spices, etc
- Bình Tân District	1 Co-op	28	Specialized and diversified farming	eggplant, cabbage...
- Other districts	Teams of peasants & individuals	798	Specialized and diversified farming	leaf and tuber vegetables, spices, etc
4. An Giang		20		
- Long Xuyên City	Teams of peasants & individuals	8	Specialized and diversified farming	cabbage, kohlrabi, corn, etc
- Chợ Mới District	5 Co-ops & Team of peasants	10	Specialized and diversified farming	cabbage, kohlrabi, corn, etc
- Other districts	1 Co-op & Team of peasants	02	Specialized and diversified farming	leaf and tuber vegetables, spices, etc
6. Other provinces	Co-op & Team of peasants	88.3	Specialized and diversified farming	leaf and tuber vegetables, spices, etc
Total		1,832.38		

Source: Services of Agriculture and Rural Development of Mekong provinces

production of safe vegetables in nethouses can bring in from VND 150 million to 180 million a year for a hectare.

In short, favorable climatic and natural conditions, and good irrigation system allow the Delta to become the leading supplier of vegetables and gain high efficiency. Peasants in the Delta are eager to develop their businesses and the market for vegetables is very promising. These basic advantages allow further developments of the safe vegetable production.

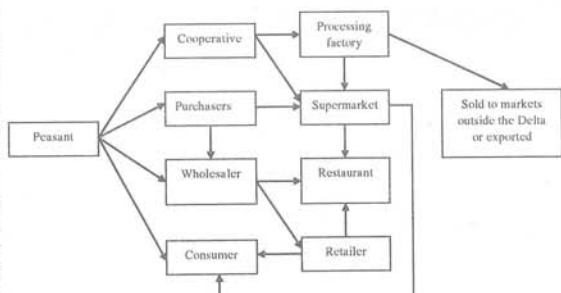
However, the production of safe vegetables in the Delta is still of a small scale and its ability to adjust to changes in the market demand is poor. Product quality is still an urgent problem to producers. Although production and consumption of safe vegetables here have observed the IPM and GAP standards, reality also shows that the product quality is not well ensured, which makes them less persuasive to the eyes of consumers. Zoning land for safe vegetable production is not clear at both national and provincial levels. Many provincial governments didn't know how to work out long-term strategies to develop crops, and vegetables in particular. In some districts, safe vegetables have been produced according to contracts between peasants and trading companies but this practice is not common enough with the result that both parties might violate their contracts (such as refusals to buy or sell the produce) when changes in prices took place.

Lack of good strains is a great obstacle because, the

yield depends on various factors, such as seed, farming techniques, climatic conditions, and fertility of soil, etc., and the strain plays a decisive role. Moreover, production and sale of vegetable strains are not well under control with the result that bad strains still cause damage to producers. Supply of vegetables on the domestic market is controlled by private traders in some wholesaling markets and supermarkets, so this business is unruly and poorly organized and aiming at making profit instead of safety for consumers.

5. Distribution channels for safe vegetable

Figure 1: Distribution channels for safe vegetables



a. Description

Safe vegetables in the Delta after harvest are distributed through the following channels:

- Channel 1: Peasants → Purchasers → Wholesalers → Retailers → Consumers.

This is a traditional channel that account for some 30% of the output supplied to the market.

Table 3: Efficiency of safe vegetable production in the Delta per crop/hectare (VND1,000)

Vegetable	Total cost	Including:		Output value	Profit	Compared with vegetable produced traditionally
		Materials	Labor			
Cucumber	26,800	24,300	2,500	47,200	20,400	1,200
Spicy vegetable	39,600	15,100	24,500	125,500	85,900	1,400
Eggplant	34,050	20,050	14,000	90,000	55,950	1,200
Bittermelon	55,600	23,600	32,000	94,830	39,230	1,300
Sweet mustard	3,650	2,580	1,070	14,400	10,750	1,700
Long white cabbage	4,290	3,000	1,290	18,040	13,750	1,500
Mustard green	3,800	2,750	1,050	15,200	11,400	1,400
Lettuce	17,000	6,500	10,500	33,000	16,000	1,100
String bean	21,850	12,000	9,850	41,000	19,150	1,300
Cabbage	12,700	6,985	5,715	24,130	11,430	1,200

Source: A 2008 survey

- Channel 2: Peasants → Cooperatives → Supermarkets → Restaurants and consumers.

This channel controls some 50% of the output supplied.

- Channel 3: Peasants → Cooperatives → Purchasing companies from other zones → Domestic or foreign markets.

This channel brings vegetables from the Mekong Delta to other zones and accounts for 18% - 20% of the output.

- Channel 4: Peasants → Consumers.

This channel operates in districts in which peasants sell their produce directly to consumers. The channel 4 controls only 1% or 2% of the output.

b. Marketing cost, profit and distribution of added value of vegetables in various channels:

The Table 4 presents clearly the marketing cost and profit for each participant in the distribution channel. The surveyed price is the average one at the time of survey, and the cost is the average one paid on the surveyed day by the participant for a kilogram of specific vegetable. These results serve as a basis for estimates of changes in the market price and distribution of profit among participants.

Results of analyses show that the production cost represents a large proportion in the price establishing structure (57.5% in the channel 1; 60% to 63% channel 2; 58.2% channel 3). Hikes in the selling price come mostly from marketing cost paid by private purchasers, wholesalers, supermarkets and retailers (42.5% in the channel 1; some 40% in the channel 2 and 41.8% in the channel 3).

In the consumption sector, the marketing cost covered by purchasers is higher than the one paid by retailers, so the profit per a unit sold earned by the former is lower than that earned by the latter, but the

total profit for the former every day is much bigger because they can sell from 250 to 400 kg a day. Statistics also show that processing factories and vegetable cooperatives suffered high overheads, and as a result the ratio of profit to cost is also high. As for purchasers and wholesalers, their selling price changes constantly due to lower expenses but their profit-to-cost ratio is very high. Profit earned by purchasers when selling to retailers is smaller than what they earn when selling directly to consumers (VND200 compared with VND400 per kg). Expenses covered by retailers are usually small so the profit-to-cost ratio is high.

Results of the field survey shows that in the consumption channel the profit is not concentrated too much in the hand of any participant. The price offered by peasants and intermediaries in the channel depends on relation between market forces. When the market price changes, all participants can adjust their selling prices accordingly. Unofficial information on the free market helps keep the average prices from various zones at its equilibrium.

6. Measures to develop production of safe vegetables

a. Reorganization of production:

- Certificate for producers of safe vegetables: Local agencies for crop protection can assess producers' facilities (farming area, supply of water, location, technical knowledge, etc.) and ask the provincial Service of Agriculture and Rural Development to grant certificates to peasants who reach the standard necessary to produce safe vegetables. Before producing, the producer should announce the quality standard according to rules on announcement of the standard for product quality.

Table 4: Changes in prices of cucumber in the distribution channel (VND/kg)

Price offered by	Channel 1		Channel 2				Channel 3		Channel 4	
	Selling price	%	Channel 2a		Channel 2b		Selling price	%	Selling price	%
			Selling price	%	Selling price	%				
Peasant	2,500	57.5	2,800	60.9	2,800	63.6	3,550	58.2	3,600	100
Cooperative or purchasers	3,100	71.3	3,500	76.1	3,500	79.5	4,550	74.6	-	-
Wholesaler and supermarket	3,550	81.6	4,600	100.0	4,400	100.0	-	-	-	-
Retailer	4,350	100.0	-	-	-	-	-	-	-	-
Purchasing company	-	-	-	-	-	-	6,100	100	-	-

Source: Author's calculation based on data gathered personally in 2008

- New production model and quality control: Various measures could be taken to encourage cooperative teams in vegetable producing zones. These teams must have their own board and operation rules. This model can help stabilize the supply and diversify kinds of safe vegetables supplied to the market.

Local authorities can help these teams to build their plans to produce and sell their output, examine their production process and check the product quality after harvest and before sale (requiring brand names or trade marks, etc.).

Other useful measures are application of mechanization of farm work, irrigation, fertilization application of pesticide, harvesting, packaging and storing; and production of necessary tools and instruments for safe vegetable production (net, plastic sheet, tray, and poles, etc.)

b. Improvement in the distribution channel:

- Reorganizing the distribution channels: New channels for safe vegetables must be built to reach district and provincial marketplaces, thereby reducing transport and marketing costs for the whole channel.

Shops of safe vegetables could be built in all marketplaces and residential areas in the province. These shops should be equipped with warehouses and instruments necessary to ensure food hygiene and safety. This measure help win consumers' trust in the safe vegetables.

Contracts to supply safe vegetables to industrial parks, factories, schools and supermarkets in HCMC and other big cities can help peasants and cooperatives expand their market share and make them feel sure when investing more energy and money in their businesses.

- Advertising vegetables from production teams: Production teams and cooperatives could place ads on the mass media aiming at schools, companies and organizations, or take part in trade and agricultural fairs in provinces and zones. Good relations with wholesalers inside or outside the province are very useful. This measure can help producers reach their potential customers.

- Cooperation in production and distribution: Training courses could be given to peasants to encourage them to join cooperatives with a view to improving their competitiveness and productive capacity. Provincial authorities had better carry out

program to link efforts by four parties: producers, authorities, businesspersons and scientists; granting land to cooperatives that want to open safe vegetable shops and processing factories that want to build warehouses and facilities in vegetable producing districts; and establish relations with HCMC-based trading companies to expand the market for safe vegetables.

- Trade promotion and brand building campaigns: Training courses and financial support could be given to peasants, cooperatives and companies with programs to build brand names for their products and reach standard of safe vegetables. Cooperatives had better open websites to advertise their safe vegetables after reaching standard of product quality. Local authorities should launch programs to encourage the production and use of safe vegetables for the public health, thereby enlarging the market for such vegetables ■

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