

# The Role of Coordination in the Safe and Organic Vegetable Chains Supplying Hanoi

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## Abstract

Recent economic, political and demographic changes in Vietnam have led to a growing urban demand for quality vegetables. Despite consumers' concern for food safety (especially with regard to pesticide residues) and both public and private initiatives taken to promote the production and marketing of IPM and organic vegetables, the market for these vegetables is still limited to less than 5% of household consumption in Hanoi. We explore the problems of intra-chain coordination which may explain this situation. Based on insights from institutional economics, we compare different coordination devices (signs, standards, horizontal coordination, vertical coordination) in the chains labelled as quality vegetable chains (safe and organic), and in the chains of "ordinary" vegetables, using quantitative and qualitative surveys conducted between 2002 and 2004 on consumers, traders and producers of leafy vegetables supplying Hanoi. The research shows that those chains that are successful in selling safe and organic vegetables have developed strategies to integrate production and retail marketing in the form of direct retail marketing or contracts between farmers and traders. Quality control is mostly organised in an internal way within the cooperatives. Only the organic vegetable company has recourse to an external body. The paper concludes with the factors necessary for the development of safe and organic vegetable chains, including the promotion of horizontal and vertical coordination, and the design and enforcement of clear standards on food safety by the state.

## INTRODUCTION

### The Limited Development of the "Safe Vegetables" Market

During the past ten years, the food consumed in Vietnamese households has changed. The reforms implemented in the policy of renovation or *doi moi*, have been reflected by spectacular economic growth. Urbanisation has quickened, even if it remains limited in comparison with other Asian countries (25% in 2002, compared to an average of 36% in South East Asia). In 2002, 70% of GDP was concentrated in the towns, which represented 46% of the domestic food market in terms of the value of goods (Moustier et al, 2003). These changes have caused an increase in the demand for more diverse and better quality products especially in urban areas.

Although consumption of vegetables has increased considerably over the past ten years, they are also the products that give consumers the most reason for concern in terms of the health risk they present. A survey of 200 households in Hanoi in 2002 demonstrated that half of them considered that the quality of foodstuffs had fallen during

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the past ten years. In 90% of the households interviewed, vegetables were the foodstuff that were perceived to present the greatest quality problem and, in 80% of cases, pesticide residues were the major source of concern (Figuíé, 2003).

Most vegetables available in Hanoi are produced in peri-urban zones where the limited size of land (generally smaller than 500 m<sup>2</sup>) and property speculation, result in farmers using increasing quantities of fertiliser and pesticides to maximise productivity per unit area. Comparing the quantities used by a sample of producers with the FAO standards shows excessive application under current practices (Thi, 1999). Cases of illness and even death caused by ingesting vegetables are regular features in the local press.

In 1995, public interest in the safety of vegetable products led the Vietnamese Ministry of Agriculture to implement an ambitious program called “safe vegetables”. In 2001, it covered an agricultural area measuring a total of 2,250 hectares (30% of the vegetable farming area of the province of Hanoi, equivalent to one quarter of the vegetables produced in Hanoi). The program educated farmers in the reasonable use of fertiliser and pesticides, as well as the use of water from wells and non-polluted rivers. Certificates of production of safe vegetables were awarded by the Department of Science and Technology to the cooperatives involved in the program. Furthermore, a network of “safe vegetable” stores was established for the distribution of vegetables produced by these cooperatives. At the same time, the production of organic vegetables began in 1999 at the initiative of an NGO (CIDSE).

Despite the consumers’ concern and the initiatives taken to promote the market for vegetables of higher quality, the proportion of vegetables sold as “safe vegetables” or organic vegetables, represents less than 5% of household consumption and less than 2% of production in Hanoi province (Moustier, 2003; Figuíé, 2003). While three hypotheses are proposed to explain the socio-economic reasons for the limited development of the market for safe vegetables in Hanoi: (1) the low profitability of safe vegetable production and marketing; (2) the possible gap between consumers’ concerns and the demand addressed in the market, in this paper we explore a third proposition: the weak development of quality chains might be related to problems with quality signs and stakeholders’ coordination mechanisms.

## **MATERIAL AND METHOD**

### **Comparison between Ordinary, Safe and Organic Chains**

In the paper, we focus on quality as an “information” problem rather than as a “technical problem”, as the former dimension is commonly under-estimated in Vietnam. We compare the chains labelled as quality vegetable chains (safe and organic), and the chains of “ordinary” vegetables, to investigate whether the different patterns of coordination (signs, standards, horizontal coordination, vertical coordination) are more developed in those chains that succeed in having the highest share of vegetables sold as safe or organic. The indicators considered for this are vegetable safety (on product at the point of sale) and a premium for vegetable safety in terms of prices of more than 30%. We keep the term “safe” for the IPM vegetables and the term “organic” for those vegetables produced without any chemical (although this may convey the misled idea that organic vegetables are not safe).

### **Unit of Analysis**

The organisation of vegetable chains in Hanoi is closely linked to the origin of the products and the extent to which they are perishable, the two factors themselves being linked (Moustier et al, 2004), so it is necessary to choose a given category of product to assess variations in the organisation of commodity chains that relate to quality. In this paper, we focus on the analysis on leafy vegetables, which mostly originate from peri-urban areas, less than 30 kilometres from the city markets, and for which consumers express the highest safety concerns (Figuíé, 2003).

## **Different Steps and Tools Used for Data Collection**

To assess coordination in the quality chain, data was collected through different surveys conducted between 2001 and 2004, combining different tools; inventory, sample study, document analysis and in-depth interviews of the actors involved in the distribution of fresh produce: producers, wholesalers, retailers (shops, stall, supermarkets) and consumers. The first set of surveys relate to quality signs and standards and consumers perceptions. A second set of surveys relate to forms of coordination for ordinary, safe and organic vegetable chains. Quick observations reveal that the market is clearly segmented in terms of point-of-sale between ordinary vegetables (sold in most market stalls), safe vegetables (sold in specific market stalls, shops and supermarkets), and organic vegetables (sold in specific shops). The organisation of marketing chains in terms of the number and characteristics of different intermediaries between producers and consumers was investigated through market surveys. Patterns of horizontal and vertical coordination were investigated through in-depth interviews of all stakeholders of a same network from production to consumption for the three different chains.

## **RESULTS**

### **Limited Coordination in Ordinary Vegetable Chains**

**1. Absent Signs and Standards.** Ordinary vegetables are defined here as vegetables sold in wholesale and retail markets. For these vegetables, there are no indicators of standards or quality control. Ordinary vegetables constitute more than 95% of the vegetables sold in Hanoi, despite the strong political willingness to deal with the food safety problem. A lot of institutions coordinated by the Ministry of Health are involved in regulations, standardization, control and communication on vegetable quality (Ministry of Agriculture and Rural Development, Ministry of Science and Technology, Ministry of Trade, People's Committee), with shared responsibilities according to the kind of vegetables (fresh, processed, or imported) and the place of control (in the field, the market, or on the plate). There are however, very few controls (mostly limited to the "month of health") in Hanoi and penalties in case of detected problems are not clearly stated. Given the costs and institutional difficulties of controlling all vegetables in Hanoi, the authorities have preferred to concentrate on the development of a segmented market for safe vegetables, in the expectation that quality development will spread to all chains in the longer term.

**2. Vertical Coordination: Spot Relationships.** A common feature of leafy vegetable chains, whatever their quality characteristics, is the involvement of producers in collecting and selling the products to retailers (Fig. 1). This is due to leafy-vegetables mostly originating from peri-urban areas less than 30 kilometres from the city markets. On average, 85% of the total volume of water morning glory sold during the year in urban wholesale markets (where retailers get their supply) is sold by producers, often acting as collector agents for other producers. More than 95% of the producers and buyers use two-wheeled transport to travel to the wholesale markets in Hanoi. Most farmers interviewed in peri-urban villages (70%) sell vegetables to collector agents (other farmers) who buy vegetables from 3 to 10 farmers and resell the vegetables in wholesale markets (around 300 kg/day).

From the network survey, it can be concluded that the interactions between farmers and collector agents, farmers and retailers, and collector agents and retailers, are characterised by a combination of spot relationships, with regular relationships based on long-term knowledge and residence in the same village (in the case of farmers and collector agents). But these regular relationships do not involve any commitment regarding prior sales or purchases, volumes, prices or quality. An indicator of the occasional nature of the interactions is that in times of product abundance (especially from December to March), farmers have to move to urban markets as collector agents will not travel to the farm. Farmers and collector agents selling to night markets commonly spend 9 hours per night in transportation and waiting for buyers in the night markets. This time equates roughly to USD1 per day in terms of labour cost (nearly half the income of

farmers and one third of the collector agent's income). This can be considered as an indication of high transaction costs in these chains when uncertainty about finding partners in the transaction prevails. The only product quality requirements for collector agents relate to visual appearance, especially freshness. Prices vary according to the supply in the night market and the margins collected by the different intermediaries are limited (less than 30% between purchase and retail prices net of marketing costs).

In the wholesale markets in Hanoi, the majority of transactions between wholesalers and retailers for products of non-specific quality are occasional transactions. Numerous price-taking sellers (1,000-1,500 per night) sell small quantities of vegetables. As for peri-urban vegetable farmers in Hanoi, they represent more than 3,600 farms (An et al, 2004), another indicator of competition. Loyalty can nevertheless be observed between large-scale retailers (e.g. retailers in Mo market, selling more than 70 kg of vegetables per day) and collector agents in securing supplies daily rather than having to go to the wholesale market. These relations do not involve any quality commitments.

**3. Absent Horizontal Coordination.** Peri-urban farmers are involved in cooperatives, but for ordinary vegetables, these cooperatives deal mostly with infrastructure (e.g., irrigation), and are not involved in marketing, which takes place on an individual basis (with the possible involvement of the spouse).

### **Coordination in Safe Vegetable Chains**

**1. Diverse Signs, Confuse Control.** At the moment, there are two types of visible signs aimed at the consumers concerning sanitary quality: the "rau an toan" or "rau sach" sign (safe or clean vegetables), and the "Hanoi Organics" sign for organic vegetables. These signs refer to production processes: integrated pest management for safe vegetables and organic agriculture for Hanoi Organics. In certain cases, the origin of the product, in terms of which firm produces or sells the produce (name, location) may also be indicated, as is the case for the safe vegetable stalls of the Van Tri cooperative and for certain stores selling vegetables from the Van Noi cooperative. The quality signs are either carried on the products (plastic packaging) or at the point-of-sale which markets the vegetables.

Consumers are poorly informed about the meaning of "safe vegetables" and "organic vegetables" (Figuié, 2004). There is considerable confusion in the media around these two terms, with a number of articles using the term "organic vegetable" to designate the production of "safe vegetables". We also encountered one shop selling vegetables with the "organic" sign while the vegetables originated from a "safe vegetable" area. Consumers generally use the term "safe vegetables" to designate vegetables that are assumed not to have undergone any chemical treatment, a definition that should apply to organic vegetables only.

These signs are not governed by a consolidated standardisation and certification process. In 1998, the Ministry of Agriculture and Rural Development issued a temporary regulation on the production of safe vegetables, which indicates the authorised and prohibited pesticides, maximum residue limits of pesticides and fertilisers, content of heavy metals and presence of bacterial pathogens "below the tolerance of FAO/WHO or other advanced countries pending the promulgation of Vietnamese norms" (MARD, 1998). However, these regulations do not provide user-friendly control procedures and they don't provide for sanctions in the case of non-compliance. The lack of standard enforcement enhances consumer's confusion as any enterprise may abusively use the term "organic" without risking sanctions. Between 1995 and 2001, the Department of Science and Technology awarded a certificate to cooperatives committed to the safe vegetables program, which involved laboratory analyses, but it stopped doing this in 2001.

We can conclude that the quality signs are confused and the criteria to be checked to guarantee quality are not clearly defined.

**2. Vertical Coordination.** The first observation relates to the small number of production enterprises supplying safe vegetables to shops, supermarkets and market stalls. These enterprises are directly involved in marketing the produce to retailers or consumers hence they are vertically integrated (Fig. 2).

By tracing the suppliers of safe vegetables, we found that market stalls, shops, supermarkets and schools are primarily supplied for these products by the cooperatives of Duyen Ha, Van Tri and Van Noi (covering less than 450 farms), as well as by the Technical Fruit and Vegetable centre (a center of mixed public and private status, covering around 3 hectares), all of which are located in the peri-urban zone of Hanoi.

Direct retail marketing is carried out by Van Tri cooperative through points-of-sale rented and managed by cooperative members. The direct sales of Van Tri vegetables by the producers allow regular contact with the consumers who ask questions and are given answers concerning the production methods used by the cooperative. For suppliers other than Van Tri, written or verbal contracts link retailers and farmer groups, which specify the frequency of delivery (usually daily), quality requirements and terms of payment (cash, 15 to 30 days after delivery). Quality requirements are usually limited to the provision of a certificate of safe vegetable production. As we mentioned earlier, these certificates are no longer updated, but they are an indication of past training and efforts in terms of quality for the buyers. Written contracts exist for 10 shops or stalls out of 15, and for 9 supermarkets out of 11.

**3. Horizontal Coordination.** The three production enterprises supplying safe vegetables to shops, supermarkets and market stalls are farmers' groups, except the Technical Center for Fruits and Vegetables, which is a hierarchical institution. Van Tri and Van Noi are commercial cooperatives, which have existed in Vietnam since 1993 (after decollectivisation), and which are characterised by farmers' voluntarily participating in the cooperative and sharing the profits of the joint activities. Duyen Ha is more in line with the old model of a cooperative that is administered rather than commercial. Collective action, as regards quality control, is the most developed for Van Tri cooperative, which is also the one that reaches the highest share in the sale of safe vegetables and has the most integrated form of vertical coordination. The cooperative has a board of four members, the highest contributors, who are in charge of crop planning, quality inspection, management of retail stalls, input supply and interfaces with the authorities, i.e., for organisation of IPM training and delivery of certificates. In addition to selling the products from its members, it has a branch in Moc Chau, a mountainous area located around 500 kilometres from Hanoi, in the form of another cooperative of 7 members, whose head, Mr T., sells off-season vegetables to Van Tri cooperative. Mr T's cooperative signs contracts with 4 farmers to whom he supplies inputs and technical advice, which allows him to exert control over production protocols. He buys all the outputs of these farmers at stable prices, and participates in the risk of production by not asking for input credit in case of product losses. Mr T also employs two vegetable farmers as salaried workers, which represents an even greater commitment to the production process.

The case of Van Tri cooperative demonstrates that the most developed mechanisms of coordination reduce information problems related to quality control: (i) for the personal relationships developed between the members who live in the same village, half of them are bound by kinship relationships, and half by financial obligations; (ii) the inter-linkages between the supply of inputs and training services, quality control and output marketing reduce opportunistic behaviour, as default on one commitment, e.g., IPM procedures, may have consequences on other transactions, i.e., input provisioning; and (iii) the hierarchical power of the cooperative board in terms of decision-making.

### **Coordination in Organic Chains**

**1. Attempts at Certified Quality Signs.** From its opening in 1999 until June 2004, the Hanoi Organics company was the only enterprise subject to yearly external control and awarded a certificate of conformity with international organic production standards. This certificate was awarded by the "Organic Agricultural Certification Thailand". The Hanoi Organics company employs inspectors who effect surprise controls on producers in order to inspect production protocols. Unfortunately this certification lapsed in June 2004 due to financial difficulties.

**2. Vertical Coordination: Contracting.** In 2002, the Hanoi Organics company was distributing organic vegetables via its own shop, as well as delivering directly to consumers and to schools (Fig. 3). The company signed a two-year contract with 6 families of producers in the Tu Liem district (Hanoi province) and 32 farmers in Chuong My district (Ha Tay province), specifying the production regulations and frequency of controls. Quantities and prices are renegotiated every three months (they amount to two to three times the prices of ordinary vegetables). This company employs private inspectors who effect surprise controls on producers four times per year, imposing sanctions in the event of chemical products being used. It also employs four technical staff to provide farmer training on organic production, and for the collection and distribution of products.

**3. Limited Horizontal Coordination.** Currently, there is no collective action among producers as regards the grouping of sales or quality control, which creates some dependence between the farmers and the marketing company. Problems of inadequate coordination between farmers and the company arise when farmers complain that they commonly wait two to three hours for the truck to collect their vegetables. Delays in deliveries have adverse consequences on the freshness of the produce, which could be reduced by more direct involvement of farmers in the distribution process. Besides, farmers state that the company does not always estimate the production capacities of the farmers and the possible outlets, and that the contracts are inadequate to cover all the produce harvested by the farmers, a fact acknowledged by the company. Hence, on average, 25% of the production has to be sold outside the company, at prices only marginally higher than the prices of ordinary vegetables.

## **DISCUSSION AND CONCLUSION**

The comparison of ordinary and quality vegetable chains (safe and organic), confirms the proposition that integrated forms of coordination and farmers' collective action are more developed in those chains that get a premium for quality, together with the presence of signs and reference to quality standards. The promotion of these forms of coordination have so far been limited to a few innovative farmers (in the case of safe vegetables) and the combination of an entrepreneurial businessman with an NGO in the case of organic vegetables. Furthermore, the analysis points at some weakness in coordination that makes quality vegetable chains fragile; in particular, the lack of clear standards and enforcement procedures for vegetable safety which threatens the credibility of the quality efforts developed by safe vegetable cooperatives, reducing the final market and restricting supplies to groups where quality control enforcement can be operated by trust and hierarchy. In this context, the State has at least three roles to fulfil: (i) defining minimum non-toxic standards and ensuring they are respected; (ii) supporting the definition and control of compliance with private standards, notably via laboratory accreditation; and, (iii) providing information on the advantages and disadvantages of different methods of coordination. At present, new standardisation, control and certification procedures are being introduced in Vietnam on the initiative of local and international public actors. For instance, the Department for the Protection of Vegetables, at the Department of Agriculture in Hanoi has been given the mandate to award "safe vegetable" certificates to producer cooperatives in early 2005. Alongside this, a group of NGOs and governmental organisations involved in IPM or organic agriculture is endeavouring to develop a project of private certification for these types of production. Unfortunately, the private sector is seldom involved in these initiatives for the time being. An evaluation is required of the impact on the actors of the vegetable chains of these emerging new modes of standardisation, control and certification.

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Vietnamese research platform on food markets in Vietnam (MALICA).

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## Figures

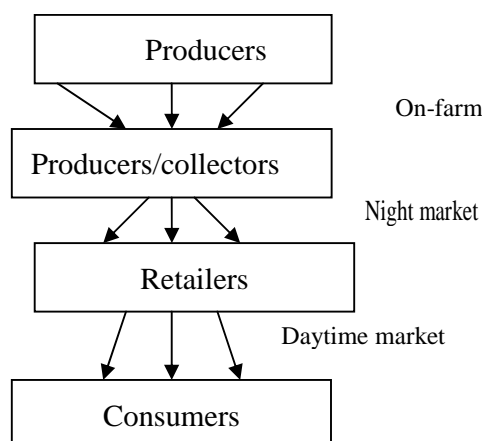


Fig. 1. Marketing chains of leafy-vegetables in Hanoi.

Source: Hoang Bang An et al., 2003. The chains illustrated here represent more than 80 % of transactions.

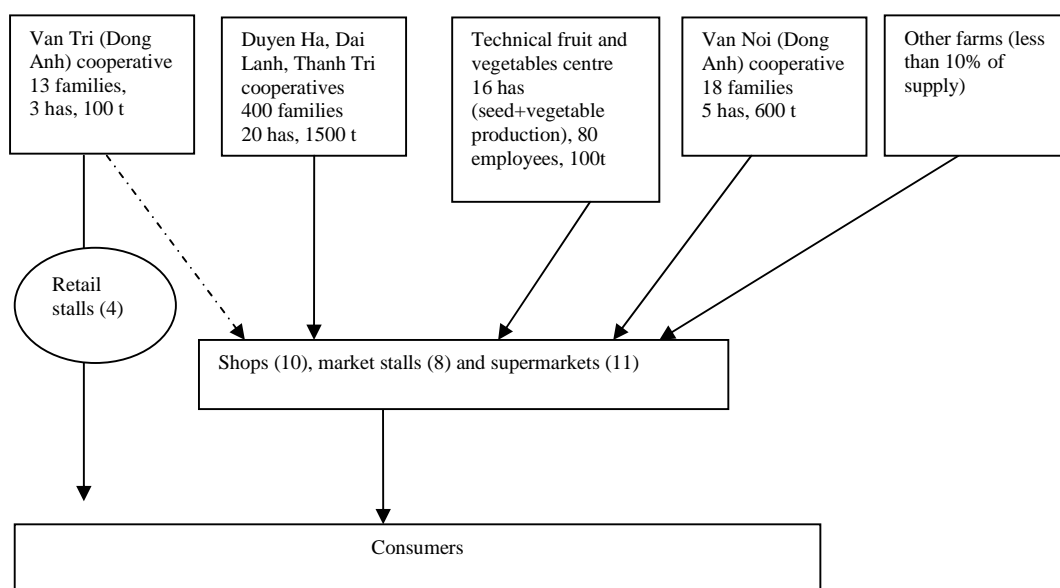


Fig. 2. Simplified chain of “safe vegetables” in Hanoi in 2002.

Source: Dini (2002) and Nguyen Thi Tan Loc (2002)- Notes: (i) The number of shops, market stalls and supermarkets surveyed represent 85% of total; (ii) in 2005, Van Tri cooperative was no more selling to supermarkets because of estimated too harsh conditions in terms of payment delays and vegetable sorting; on the other hand the number of retail stalls had increased to 10; (iii) Golden Garden Company, a mixed American-Vietnamese company which sells vegetables from Lam Dong province with contractual arrangements is also involved in the supply of safe vegetables, but that does not apply to leafy vegetables; (iv) the provision of safe vegetables to schools and restaurants is not indicated in this graph for matters of simplification, but they follow similar chains.



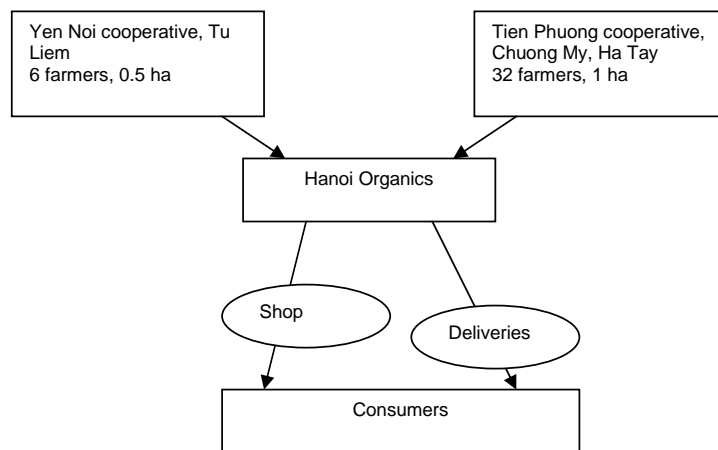


Fig. 3. Simplified organic vegetable chain in Hanoi in 2002.  
Source: Dini (2002) and Nguyen Hung Anh (2003).