

## CHAPTER 10

# SUPPLY-CHAIN DEVELOPMENT FOR FRESH FRUITS AND VEGETABLES IN THAILAND

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**Abstract.** In this case study two supply-chain development projects in Thailand are analysed:

1. TOPS Thailand: introduction of food safety standards for the domestic market.
2. Fresh Partners: development of an integrated quality chain for the export market.

TOPS Thailand is a retail company with about 50 supermarkets in Bangkok and Chiangmai. The management decided to introduce a certification system for food safety in order to improve their competitive position and to consolidate their image of a quality supermarket. The introduction resulted in a system of preferred suppliers that had to obtain a certificate for good agricultural practices from the Department of Agriculture. The number of suppliers sharply dropped in the course of the project period. Fresh Partners Thailand is an export company shipping exotic vegetables from Thailand to The Netherlands and surrounding countries in Europe. The management decided to develop an integrated quality chain in order to comply with the increasing food safety requirements in the European Union and Japan. The investments in quality systems coincide with a growing demand for exotic vegetables in north-western Europe. Consequently export volumes and numbers of smallholders and labourers are rapidly growing.

**Keywords:** food safety; export; retail; good agricultural practices; quality systems

### INTRODUCTION

Since 1999 researchers of the Agricultural Economics Research Institute LEI – a part of Wageningen University and Research Centre (Wageningen UR) – were involved in the implementation of two completely different supply-chain development projects in Thailand. One project was focused at the domestic market and the other at the export market. In this case study the experiences and findings gathered during project implementation are set side by side. The exercise gives a highly interesting glimpse behind the scenes of supply-chain development. The first project represents the conduct of a retail company (TOPS Thailand) and the second the conduct of an export company (Thai Fresh) in supply-chain development. A retail company occupies an other position between producer and consumer than an export company. Consequently their strategies with regard to supply-chain

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development may be different. As a result the impacts for smallholder development and sustainability may also diverge.

The ambition of the case study is to identify both critical success factors and critical success actors for supply-chain development. Starting supply-chain development from a retail company has other effects for smallholder involvement and sustainability than starting from an export company. Policymakers and business partners should be aware of these effects and include them in the strategic decision-making process for supply-chain development.

### TOPS THAILAND PROJECT

In 1996 the Dutch retail company Royal Ahold established a joint venture with the Central Retail Corporation in Thailand, running over thirty TOPS supermarkets in Bangkok and Chiangmai. The management was instructed to transform TOPS into a flourishing high-quality supermarket chain. As a first step World Fresh, the distribution centre for fresh products, was established. Furthermore, the product flow from the distribution centre to the individual branches was streamlined. Meanwhile the economic recession in Asia also affected Thailand. Consequently the TOPS management had to undertake actions to improve their competitive position. Cost reduction and quality improvement at the upstream side of the distribution centre became the strategic attention points. At this point researchers of Wageningen UR were enlisted to elaborate options for implementation. The process was supervised by a Steering Committee, consisting of executives of companies and institutions, directly or indirectly involved in supply-chain development.

Technical experts quantified the possible reductions in transaction costs of bringing down the number of suppliers for individual fresh products. These calculations resulted in a strategy of preferred suppliers. Subsequently socioeconomic experts were enlisted to elaborate the strategy of preferred suppliers and simultaneously safeguard product quality with regard to food hygiene and pesticide residues. The final outcome was that preferred suppliers had to operate under a certification system for good agricultural practices. The TOPS management decided to embrace the certification system for good agricultural practices of the Department of Agriculture (DoA). The suppliers were bound to obtain a certificate from DoA.

The pathway to certification included two phases. In the first phase the socioeconomic experts identified five actual production systems for vegetables in Thailand (Table 1) and suggested to give preference to growers presently applying the production system of 'Intelligent Pesticide Management'. The reasons for this preference were threefold: balanced use of fertilizers and pesticides, readiness to comply with certification standards, and enough production capacity to safeguard a continuous supply of fresh vegetables. The information in Table X.1 makes clear that the choice for 'Intelligent Pesticide Management' leads away from the smallholders who are traditionally supported by public or semi-public institutions like agricultural extension, government-supported projects and non-governmental organizations.

**Table 1.** Qualifications of five production systems for vegetables in Thailand according to the use of agro-chemicals, development context and certification framework

Characteristic	Conventional local-market growers	Conventional professional growers	'Intelligent Pesticide Management'	Integrated pest management	Organic
Use of synthetic pesticides	High	High	Reduced	Low	None
Use of artificial fertilizers	Divergent	Optimal	Balanced	Balanced	None
Institutional support	Agricultural extension	Input suppliers	Input suppliers	FAO-project Non-Form.Ed.	Various NGOs
Development approach	Top-down	Participative	Participative	Bottom-up	Bottom-up
Development objective	Technology application	Yield security	Save product	Pest prevention	Sustainable agriculture
Development phase	Struggling	Standing	Arising	Pioneering	Pioneering
Certification standard	None	None	FAO codex	FAO codex	IFOAM
Certification level	None	None	Product	Process and product	Process
Certification agency	None	None	Agricultural departments	Agricultural departments	Still lacking
Certification label	None	None	Non-toxic	Non-toxic	Organic
Residue analysis	Public health	Supermarket	Agricultural departments	Agricultural departments	Not relevant

In the second phase the socioeconomic experts checked the opinions on certification among the various stakeholders within and around the supply chain. The majority of the stakeholders (8 out of 10) were at least conditionally positive on certification (Table 2). The information of Table 2 makes clear that (unfortunately) the vegetable brokers and the buying department were negative about certification. They wanted to keep their hands free for transactions with non-certified partners. Furthermore the costs of certification gave rise to long discussions. Finally the TOPS management obliged all suppliers of fresh vegetables and fruits to obtain a certificate from the Department of Agriculture, thus bypassing the objections of vegetable brokers and the buying department.

Due to financial problems Royal Ahold was forced to discontinue their participation in the TOPS supermarkets in Bangkok. The involvement of researchers of Wageningen UR was also discontinued. According to recent information the new owners of TOPS have continued the certification relationship with the Department of Agriculture.

*Table 2. Opinions on certification of stakeholders involved in the supply chain of fresh vegetables and fruit in Thailand*

Stakeholder	Opinion
Crop-protection associations	positive
Pesticide companies	conditionally positive
Seed companies	conditionally positive
Vegetable growers	conditionally positive
Vegetable brokers	negative
Buying department	negative
TOPS / World Fresh	positive
Consumer-interest groups	positive
Inspection bodies	conditionally positive
Dept. of Agriculture	conditionally positive

#### *Lessons learned*

The TOPS management had to operate under rather difficult business conditions. They decided to focus on reduction of transaction costs and improvement of food safety levels. As a result a selection process among the original suppliers was initiated. The more professional and advanced growers and traders achieved a preferred position. Their less professional and advanced colleagues had to abandon the field. Consequently the integration of smallholders in the supply chain of TOPS was reduced. The decision to select growers already applying 'Intelligent Pesticide Management' implies a kind of disqualification of the public and semi-public institutions (like agricultural extension, government supported projects and NGOs) that traditionally support smallholders. The Department of Agriculture has operated quite visionary by developing a certification system for good agricultural practices. On the other hand DoA has been manoeuvred into a vulnerable position. Retailers can hide themselves behind DoA when 'certified' products at some time turn out to be substandard. In such cases the Ministry of Agriculture may suffer a loss of face.

Vegetable traders and the buying department felt themselves restricted in their freedom of transaction by the requirements of certification. Certification makes it more difficult to take refuge to cheap solutions or to occasional suppliers. For businessmen the job satisfaction is often found in this type of opportunities. This means that private and public policymakers should not count too much on the cooperation of businessmen in certification processes.

The socioeconomic experts of Wageningen UR got easy access to both public and private parties in and around the fresh vegetable and fruit supply chain in Thailand. They further got the impression that contacts between public parties and private parties were exceptional. This means that university researchers can play a very constructive role in supply-chain development as mediators between public parties and private parties.

*Stages and conditions*

During the project period different stages followed each other. In each stage different basic conditions for growth were actual. The stages and conditions are specified in Table 3.

*Table 3. Successive stages and matching conditions for growth in TOPS Thailand project*

Period	Stage	Basic conditions for growth
1999	Forming	Competition
2000	Organizing	Risk/return
2002	Implementing	Government involvement

## THAI FRESH PROJECT

The Thai Fresh project was initiated in 1999 when Golden Exotics Holland and KLM Cargo established a distribution and packing centre in the vicinity of Bangkok airport. In the years before, Golden Exotics had already built up a good reputation in the distribution of exotic vegetables from Thailand in Germany, United Kingdom, The Netherlands and Belgium. In those years fresh products were purchased from wholesalers and brokers. This mode of sourcing was no longer workable, owing to the increasing quality and safety requirements of the international end-markets in the EU and Japan. In fact Golden Exotics Holland faced increasing problems with the Dutch Inspectorate for Health Protection regarding pesticide residues. From 2002 on, researchers of LEI were actively involved in the project. The involvement of LEI was co-funded by the Dutch Ministry of Development Cooperation (SENTER – PSOM programme).

The Thai Fresh project aimed at the development of an integrated quality chain for export of exotic vegetables. The challenge of developing such an integrated quality chain is translating the quality and safety requirements at retail level into good agricultural practices at producer level and to develop a supply-chain structure for a reliable tracing and tracking system. The challenges concerned were tackled in two successive actions: (1) the establishment of a distribution and packing centre at Bangkok airport, and (2) the establishment of a regional post-harvest centre in Ratchaburi province.

The establishment of the distribution and packing centre at Bangkok airport was a first step in getting a better control on product quality and food safety. In the beginning the fresh products were purchased from Bangkok-based wholesale traders. After delivery at the distribution and packing centre the products are graded, sorted, washed, packed and temporarily stored in a cold room, where pallet build-up for freighting, inspections by customs and the quarantine service are executed in the meantime. The distribution and packing centre can be regarded as value-added centre, where grades and standards are implemented and where compliance with these standards is enforced. HACCP has been introduced at the distribution and packing centre in order to arrive at good manufacturing practices (GMP).

Introduction was accompanied by the development of Standard Operating Procedures (SOPs) and the implementation of a training programme for the managers and the workers at the centre.

The establishment of the distribution and packing centre was prompted by developments in the international end-markets in the EU and Japan. In the late 1990s consumer confidence in EU and Japan reached an all-time low. Consumers began to demand more transparency in the food chain. This transparency included the verification of the composition of the product, its origin and traceability, its safety, and the claims that were made concerning product features like nutritional values, health effects, etc.

Sourcing from Bangkok-based wholesale traders implied a number of weaknesses regarding quality and safety assurance:

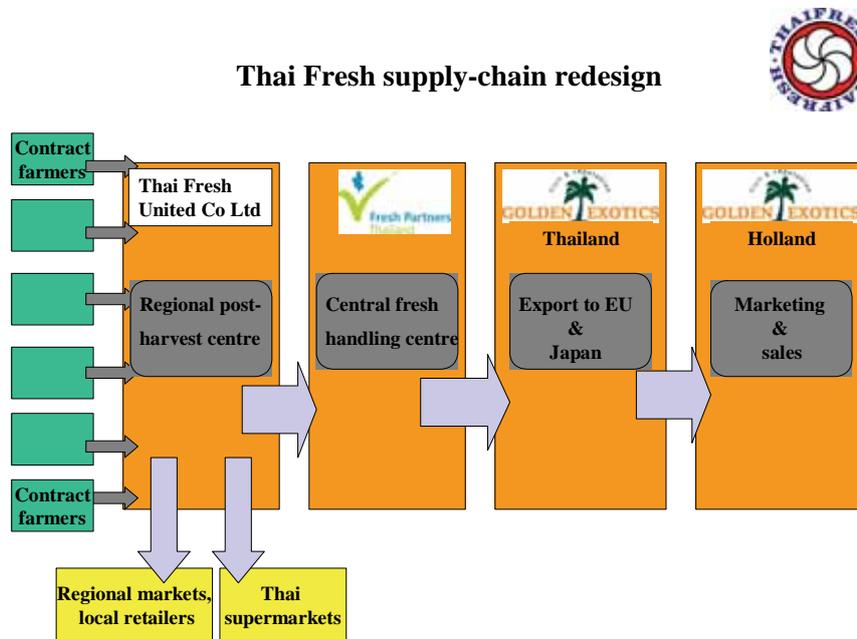
- The lack of quality control at the farm led to a variable quality of vegetables. Subsequently, this resulted in a relatively high level of rejection of substandard quality at export destination and hence financial loss due to waste.
- The fact that there was no recognized standard of quality in Thailand also resulted in a decreasing access to the EU markets and prevented new access to the high-value Japanese market.

The distribution and packing centre in Bangkok was not sufficient to solve these weaknesses. Therefore a further upward integration of the supply chain was considered to be necessary. For that purpose a regional post-harvest centre was built (2003) in the production region of Ratchaburi province. The post-harvest centre also serves as a knowledge centre for the growers. The centre provides the growers with extension services and farming inputs so that they can apply good agricultural practices and integrated crop management techniques. The services concerned have the target to get the growers certified according to EUREP-GAP.

Pesticide residues are the most important food safety concern in the vegetable supply chain. For that reason farmers are being trained in good agricultural practices (GAP) with regard to pesticide application. The GAP terms of reference imply: (a) minimizing the use of agrochemicals and implementing a traceability system; (b) becoming aware and taking care of environmental protection and efficient use of resources; (c) assure the workers' health, safety and welfare. The training is provided by a team of experts consisting of a full-time extension worker of Thai Fresh, an agronomist From Kasetsart University and back-up support from Bureau Veritas (certification company) and LEI. The training includes the preparation of a pesticide policy manual for the contract growers and assistance in setting up a record-keeping system.

The establishment of the regional post-harvest centre in Ratchaburi implies a shortening of the supply chain by by-passing the wholesale traders. As for the primary production level, commitment from the growers is created through contractual agreements on purchases and by making them shareholders of the regional post-harvest centre.

The organizational structure of the Thai Fresh supply chain has been depicted in Figure 1.



*Figure 1. Organizational structure of the Thai Fresh integrated quality chain*

The Thai Fresh Business model (Figure 1), combined with the strategy for building competences along the various levels of the supply chain, appears to be quite successful. The export volumes to Europe show an impressive growth rate. The present export results are considered so promising that export to Japan has no priority for the time being.

In the near future a demonstration garden on the land adjacent to the post-harvest centre will be established to support the suppliers/growers further. Follow-up investments in Thailand and Vietnam are under consideration. The focus is on application of the business model at other products and other countries.

#### *Lessons learned*

The Thai Fresh management is operating in the rapidly growing market of exotic vegetables in Europe. Such a position makes investments in buildings, certification systems and human resources easier. The management decided to make such investments in order to maintain their access to the market of exotic vegetables in Europe. In fact the increasing need for food safety assurance was the driving force to develop an integrated quality chain. The strategy for building competences along the various levels of the supply chain has enabled numerous smallholder growers to link up with international standards. Simultaneously the involvement of wholesale traders has been reduced. The high priority for building competences may result

from the professional background of the Thai Fresh president. His career started in education.

The implementation of the grades and also the auditing and inspection of compliance has been completely in private hands. Government agencies like the Department of Agriculture and the Department of Export Promotion were hampered in playing an active role. Limited financial means and lack of capacity restrained them from taking a more prominent position in promoting commercial horticulture. The communication between public and private parties in both Thailand and The Netherlands is still sub-optimal. The specific reasons for interventions by the Dutch Inspectorate for Health Protection are not communicated to Thai Fresh or to the Department of Agriculture in Thailand. Researchers of LEI got access to all parties involved and assembled a Thai-Dutch dialogue on food safety. This experience again shows the potential of researchers in bringing public and private parties together in dialogues, seminars, lectures, etc. The most crucial element in the Thai Fresh quality chain seems to be the provision of inputs (basis for good agricultural practices) and provision of market access (both international and domestic; solid basis for commitment).

#### *Stages and conditions*

During the project period different stages followed each other. In each stage different basic conditions for growth were important. The stages and conditions are specified in Table 4.

**Table 4.** *Successive stages and matching conditions for growth in Thai Fresh project*

Period	Stage	Basic conditions for growth
2000	Forming	Access to markets – legal
2002	Organizing	Access to markets – institutional
2004	Implementing	Trust
2005	Optimizing	Risk/return

## CONCLUSION

In this section the development pathways and the matching results of TOPS Thailand and Thai Fresh are compared. The comparison aims at formulating conclusions or hypotheses with regard to smallholder involvement and the roles and contributions of public agencies, institutions, public–private partnerships and knowledge centres.

The two projects under consideration had to operate under quite different institutional and economic conditions: TOPS Thailand as a retail company in a period of economic recession in Thailand; Thai Fresh as an export company in a period of booming business for exotic vegetables in Europe. Nevertheless, the strategic choices made during the project periods reveal something of the aims and values of both companies. For TOPS Thailand as a retail company competition and

risk/return appeared to be the dominant motives for supply-chain development. Improvement of food safety and reduction of transaction costs were the major strategic attention points. As a result many smallholder producers had to abandon the field.

For Thai Fresh as an export company access to markets from both legal and institutional perspectives appeared to be the dominant motives for supply-chain development. In this case introduction of quality systems and building competences were the major strategic attention points. As a result numerous smallholder producers succeeded in linking up with international standards for good agricultural practices. On the other hand wholesale traders were excluded from participation in the international supply chain of exotic vegetables.

Comparison of both cases leads to the hypothesis that supply-chain development around an export company provides better perspectives for smallholder involvement and sustainability than supply-chain development around a retail company.

The public and semi-public agencies which traditionally support smallholders (like agricultural research and extension and NGOs) played just a minor role in supply-chain development. This may be due to their weak positions in both horticulture and social sciences. The two cases in Thailand have shown that social factors like perceptions, values, visions and strategies of stakeholders represent an important dimension in supply-chain development.

University researchers seem to have comparative advantages regarding access to public parties and private parties. Contacts among public parties and private parties appeared to be exceptional in Thailand (and also in other countries). This means that university researchers can play a very constructive role in supply-chain development as mediator between public and private parties in building public-private partnerships.