United Nations Conference on Trade and Development

Challenges and Opportunities Arising from Private Standards on Food Safety and Environment for Exporters of Fresh Fruit and Vegetables in Asia:

Experiences of Malaysia, Thailand and Viet Nam

United Nations
New York and Geneva, 2007

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UNCTAD/DITC/TED/2007/6

UNITED NATIONS PUBLICATION

Foreword

The production of fresh fruit and vegetables (FFV) for domestic and international markets provides a living to a large proportion of rural households in South-East Asia, and a basis for export diversification and agro-industrial development. Governments and the private sector in countries of this region have been working to promote the use of good agricultural practices (GAP) in the production of FFV. The wider use of GAP has helped to increase efficiency in FFV production, offer safer and healthier produce to domestic consumers and improve the safety and quality of exported FFV. Most countries have adopted gradual approaches to GAP development and implementation, with an initial focus on (consumer and worker's) safety followed by the gradual incorporation of additional requirements.

These are important achievements. Yet, as this monograph indicates, many challenges still need to be addressed. This includes the need for credible certification, improved quality-assurance infrastructure and related institutions, as well as appropriate involvement of the private sector. One major issue is how to take account of the differing needs and capacities relating to GAP implementation and certification of a large number of diverse producers and other actors in the supply chain that target markets with very different characteristics.

From an exporter's perspective, demonstrating GAP compliance to importers or customers in external markets is often essential. European importers and retailers, for example, increasingly demand certification to EurepGAP (recently renamed GlobalGAP) or an equivalent standard. Producers supplying supermarket chains in the domestic market or in other South-East Asian markets may also need to respond to a growing demand for higher level certification. However, for growers who are producing for the domestic market or for less demanding export markets, higher level certification is expensive and a luxury they can ill afford. For these producers, a gradual upgrading of national GAP schemes remains the preferable, if not the only, option. Reconciling these differing needs is a daunting challenge.

In Thailand, the Thai Chamber of Commerce and the Thai Fruit and Vegetable Producers Association, among others, have started a two-year project aimed at developing ThaiGAP, a GAP standard that aims to respond to domestic needs and which could later be benchmarked to GlobalGAP. It is envisaged that ThaiGAP will assist small-scale Thai producers to achieve group certification against the benchmarked standard.

In 2005, Thailand shipped almost 14 per cent of its FFV exports (excluding nuts and cassava) to the EU-27, an increase from only around 9 per cent in 2000 (in value terms). These exports were worth over $66 million, but accounted for less than 1 per cent of all EU imports of FFV from third countries, or just over 2 per cent if imports of processed fruit and vegetables are also taken into account. There is a clear potential for further increasing exports to the EU market provided that public and private-sector requirements can be met. This increasingly includes meeting the requirements of the GlobalGAP Standard for Fruit and Vegetables.

Demonstrating capacity to meet higher level third-party GAP certification, however, is also becoming increasingly important to successfully export to other markets. For example, Thailand has recently gained greater access to the United States market for a number of fruit that previously had been subject to phytosanitary restrictions, based on the country of origin. This implies, however, that Thai fruit exporters that are interested in taking advantage of improved market access conditions need to assess the implications of private-sector standards that play a role in the United States market. As this UNCTAD report points out, whereas meeting the requirements of government regulations may currently be a greater challenge than private-sector GAP standards for exporting to Japan and to the markets of developing countries in the South-East Asian region, there are good reasons to believe that private-sector GAP standards will play an increasingly significant role in coming years. In August 2007, a Japanese GAP standard (JGAP), which was developed by producers, retailers and distributors in that country, was approved for GlobalGAP benchmarking. Will there be a trend for large retailers to require compliance with GlobalGAP or JGAP for domestic and imported FFV? Thai FFV exports

to China have increased manifold in recent years. Will the growth of hypermarkets and the expansion of international retail corporations in China result in increasing demand for quality assurance and centralized supply management systems for imports? And will that mean that FFV exports to China will increasingly need to show compliance with higher level GAP standards, including GlobalGAP? GAP standards, including GlobalGAP, may also become more important in the context of intra-ASEAN trade. For example, the Department of Agriculture of Malaysia is initiating a formal process aimed at GlobalGAP benchmarking of SALM, its farm accreditation scheme. Malaysia is a net importer of FFV, importing some $50 million of FFV from Thailand every year. Will GlobalGAP benchmarking in Malaysia have implications, not only for Malaysian exports but also for imports into that country?

By September 2007, only around 25 Thai FFV producers/exporters had achieved GlobalGAP certification individually. For small-scale producers, GlobalGAP certification is very costly and almost impossible to achieve on their own. However, groups of small-scale growers may join together in efforts to achieve GlobalGAP certification through "option 2". Even this is not an easy process, in particular because it requires producer groups to be well organized and capable of managing an internal control system. In this context, the German development agency, GtZ, has done useful work in Thailand and other developing countries in crafting a quality management manual and working with produce marketing organizations (PMOs). Some PMOs have already achieved GlobalGAP certification. However, more may need to be done to reach out to the very large number of small-scale growers in Thailand. One of the objectives of ThaiGAP is to promote group certification to a local GlobalGAP-benchmarked GAP standard in Thailand (option 4).

The development and implementation of national GAP standards in South-East Asia offers an opportunity to take local regulatory, agronomic, social and other conditions into account. However, a number of questions remain to be addressed. How can the benefits of a locally developed GAP standard be combined with wider buyer recognition in international markets? What are the pros and cons of benchmarking vis-à-vis other (not mutually exclusive) options for GlobalGAP certification? What factors would have to be reflected in a national standard to enable it to be benchmarked? How can GlobalGAP benchmarking, where considered useful, be reconciled with the gradual approach to the development and implementation of national GAP standards? Can a GlobalGAP-benchmarked national standard be integrated into a GAP framework that also benefits producers for the domestic market and/or export markets where GlobalGAP certification is not required? Do modular approaches on GAP respond to the need for coherence and harmonization, and will they serve to avoid confusion among producers and consumers, ease access to domestic markets and reduce certification costs and the need for multiple audits?

This monograph analyses these questions and other relevant issues based on case studies of national experiences in Malaysia, Thailand and Viet Nam that were carried out by national researchers under the umbrella of UNCTAD's Consultative Task Force on Environmental Requirements and Market Access for Developing Countries. The same project has also examined relevant experiences in selected developing countries in South and Central America and East and Central Africa. The experiences of these countries provide important lessons for Thailand and other countries in South-East Asia. It should be noted, however, that there are a number of additional issues that may be specific to South-East Asia, such as the considerable importance of regional trade and the large share of exports from the countries of this region that belong to the category of "minor" fruit and vegetables as categorized by the European Union. Also, the role of private-sector standards in trade with Japan and developing countries in South-East Asia is a more recent phenomenon, and not yet researched to the same extent as their role in trade with European countries. Therefore, countries in South-East Asia have an especially strong need to further debate and research the questions raised above. This publication should provide an important input to this process.

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Acronyms

NBACFS	National Bureau of Agricultural Commodity and Food Standards (Thailand)
ASEAN	Association of Southeast Asian Nations
CP/CC	control points/compliance criteria
CTF	Consultative Task Force on Environmental Requirements and Market Access for Developing Countries (UNCTAD)
DEP	Department of Export Promotion (Thailand)
DOAE	Department of Agricultural Extension (Thailand)
DSM	Department of Standards (Malaysia)
Eurep	Euro-Retailer Produce Working Group
EurepGAP	Eurep Good Agricultural Practices
EU	European Union
FAMA	Federal Agricultural Marketing Authority (Malaysia)
FFV	fresh fruit and vegetables
GAP	good agricultural practices
GHP	good hygienic practices
GMP	good manufacturing practices
HACCP	hazard analysis and critical control points
HS	Harmonized System
ISO	International Organization for Standardization
MARD	Ministry of Agriculture and Rural Development (Viet Nam)
MARDI	Malaysian Agricultural Research and Development Institute
MRL	maximum residue level
MOA	Ministry of Agriculture and Agro-based Industries (Malaysia)
MOAC	Ministry of Agriculture and Cooperatives (Thailand)
PMO	produce marketing organization
PVS	private voluntary standard
SALM	Farm Accreditation Scheme of Malaysia
SITC	Standard Industrial Trade Classification
SPS	sanitary and phytosanitary (measures)
SQF	Safe Quality Food
USAID	United States Agency for International Development

Acknowledgements

This monograph was edited by Ulrich Hoffmann (UNCTAD secretariat) and René Vossenaar (consultant, formerly with the UNCTAD secretariat), based on country case studies prepared by national experts in Malaysia, Thailand and Viet Nam.

The editors wish to extend their special thanks to the authors of the country case studies:

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The editors would also like to acknowledge the assistance of Andrew Stevenson (with the UNCTAD secretariat till July 2007) in the publication of this monograph, Praveen Bhalla for editing the manuscript and Rafe Dent for its desktop publishing.

A number of experts commented on the draft version of this study, in particular:

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Their comments are gratefully acknowledged.

Special thanks are owed to the Government of the Netherlands, which provided generous financial support to the UNCTAD Consultative Task Force (CTF) on Environmental Requirements and Market Access for Developing Countries for the preparation of the country case studies.

I. INTRODUCTION

Background

The fresh fruit and vegetables (FFV) sector provides opportunities for export diversification, poverty alleviation and rural development (Lumpkin, Weinberger and Moore, 2005; Humphrey, 2005; UNCTAD 2006; UNCTAD 2007a). Given this, an explicit policy objective of various ASEAN countries is to increase their FFV production and exports. In Malaysia (currently a net importer of FFV), for example, the Government aims to substantially increase FFV production with a view to achieving self-sufficiency and becoming a net exporter (Ninth Malaysia Plan, 2006-2010). In Viet Nam, the Ministry of Agriculture and Rural Development (MARD) has formulated a Programme for the Development of Vegetables, Fruits and Flowers for the period 1999-2010, which aims at meeting domestic demand and increasing FFV exports to $1 billion by 2010.

However, in order to successfully increase FFV production and exports in South-East Asia certain challenges need to be addressed. These include tackling some inherent risks related to increasing FFV production, such as health and environmental impacts (due to inappropriate use of pesticides and extending agricultural production to new sites) and threats to workers' occupational health and safety (Lumpkin, Weinberger and Moore, 2005). There is also a need to assist producers, in particular small-scale growers[1], in coping with trends that may adversely affect their ability to participate in FFV value chains. Such trends include increased competition from other developing countries as a result of the concentration of retailing operations in developed countries, the rise of supermarkets in South-East Asia, and the scope and complexity of public regulations and private standards in international markets (Humphrey, 2006a).

The development and implementation of codes for good agricultural practices (GAP) that reflect national development priorities and conditions can bring benefits to developing countries by promoting the production of safe and healthy foods, improving workers' health and safety, and reducing environmental impacts.[2] It has also been argued that GAP programmes can assist farmers and exporters in developing countries in meeting regulatory and private sector requirements in export markets (for example by specifying criteria for the appropriate use of agrochemicals) and in enhancing their competitiveness. On the other hand, GAP codes may have implications for production costs and the incomes of small producers.

A number of initiatives are under way in the countries of the Association of Southeast Asian Nations (ASEAN) to promote national and regional (ASEAN-wide) GAP standards and/or guidelines. Such initiatives are driven largely by the public sector. Two key objectives are to: (a) promote the use of safe practices in FFV production and encourage effective implementation of national food safety regulations, which are often poorly enforced; and (b) facilitate access to export markets by enhancing capacities of producers to meet market requirements. In addition, ASEAN Governments (e.g. in Malaysia) have shown growing interest in promoting good farming practices and improved post-harvest handling (whether or nor certified) to support their objectives of enhancing efficiency in FFV production and boosting and diversifying FFV exports. GAP programmes may also play a useful role in supporting the participation of small-scale growers in local supermarket supply chains.

Examples of national GAP schemes are the Farm Accreditation Scheme of Malaysia (SALM), the Malaysian standard for GAP (MS-GAP 1784:2005) and the GAP scheme of Thailand's Department of Agriculture (the Q-GAP scheme). Local GAP initiatives are also under way in Viet Nam. In addition, a regional approach to GAP is being explored in the context of a project implemented under the auspices of the ASEAN secretariat with the support of the ASEAN-Australia Development Cooperation Program (box 1).

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[1] In this report, the terms small-scale growers, smallgrowers and smallholders are used interchangeably. They denote small farmers that produce on a plot of cultivated land normally not bigger than one hectare.

[2] The Food and Agriculture Organization of the United Nations (FAO) defines four pillars of GAP that apply to all scales of farming: (a) efficient production of sufficient, safe and high quality food and non-food products; (b) sustainable use of natural resources; (c) viability of farming enterprises and contribution to sustainable livelihoods; and (d) responsiveness to the cultural and social demands of society (He Changchui, 2005; Poisot, 2007).

Exports of FFV face a growing number of quality and food safety requirements in international markets. These include both mandatory government regulations, such as increasingly stringent regulations concerning the use of agrochemicals and their maximum residue levels (MRLs), as well as private sector voluntary standards (UNCTAD, 2007a). In certain markets, private sector standards may be even more stringent than public-sector regulations.[3] Certain private sector GAP standards, for example, are multidimensional, involving food safety, occupational health and safety, environmental and sometimes social issues, which require compliance with relevant regulations of both the country of production and product-related regulations of the country of destination.

An example of a private sector standard for good agricultural practices in FFV production that may have significant implications for exports, including from developing countries, is the EurepGAP standard (now called GLOBALGAP),[4] a scheme for good agricultural practices at the farm level, developed by EUREP, an association of European fresh produce retailers and importers. Another example of a GAP standard for primary production is the SQF (Safe Quality Food) 1000 Code, a food safety and quality management certification programme for the primary producer, which is applied in the Australian and United States markets (table 1).

It has been argued, for example in recent discussions in the WTO Committee on Sanitary and Phytosanitary (SPS) measures, that private sector standards may have significant implications for developing countries' exports. Similarly, in the context of discussions on trade-related development assistance, concern has been expressed that, due to the existence of stringent private sector standards, which may act as de facto mandatory requirements, technical cooperation programmes aimed at assisting producers in developing countries to comply with government regulations in developed countries may be insufficient to help them secure market entry if the challenges posed by private sector standards are not addressed. It may also result in small-scale producers being pushed out of markets.

ASEAN's FFV exports, mainly those other than nuts, are directed principally to the region's markets, in particular, China, Hong Kong (China), Japan, the Republic of Korea and Taiwan Province of China. Together, these markets absorbed 81.5 per cent of ASEAN's fresh fruit exports (excluding nuts) and 76.5 of its fresh vegetable exports in 2005 (in value terms). The growing role of GAP certification in the context of regional trade can be illustrated by the following:

- Since government regulations on food safety in regional markets are becoming increasingly stringent, some ASEAN Governments (e.g. in Thailand) are encouraging producers/exporters to adhere to GAP schemes to enhance their capacities to comply with such standards. In combination with other measures, such as mandatory testing of pesticide residues, this is seen as helping products to access external markets;
- Although SPS measures imposed through government regulations present major potential obstacles, particularly to market access in Japan and certain Asian developing countries, EurepGAP and other GAP standards for primary FFV production are also gaining importance in regional markets. For example, authorities in China and Japan[5] have been developing national GAP schemes and seeking benchmarking of these schemes to the EurepGAP

[3] This monograph deals almost exclusively with GAP standards; it does not examine the implications of other private sector standards, such as ethical and social standards. GAP standards are applied to FFV production, handling, and all processes up to the point where the produce leaves the farm. Handling, packaging and distribution of FFV after the farm gate are governed by other private standards, such as good manufacturing practices (GMP), hazard analysis and critical control points (HACCP) and the protocol developed by the British Retail Consortium (BRC), entitled the BRC Global Standards. Apart from collective GAP standards, there are also retailer-specific standards (e.g. Tesco's Nature's Choice). The analysis here focuses almost entirely on the EurepGAP standard (as a case study of a prominent private sector GAP standard) as well as public-sector and other GAP initiatives in the developing countries studied here.

[4] EUREPGAP recently changed its name and logo to GLOBALGAP, arguing that its proclaimed role in promoting the harmonization of GAP schemes had moved beyond Europe. The name change was announced at the 8th EurepGAP Conference, the EurepGAP Asia Conference, held in Bangkok on 6 and 7 September 2007 (for more information see: www.globalgap.org/cms/front_content.php?idcat=9&idart=182). Since the final drafting and editing of this manuscript was completed before that date, the name EurepGAP has been used throughout the text.

[5] The benchmarking of the Japanese GAP standard (JGAP), which was developed through a collaborative effort among Japanese producers, retailers and distributors, was approved in August 2007, following a formal harmonization process of 15 months.

standard. Some have argued that benchmarking national GAP codes to EurepGAP could facilitate mutual acceptance of national GAP codes among Asian developing countries and that this is perhaps easier to accomplish than formal mutual recognition agreements (Robert and Menon, 2006);

- Adherence to GAP schemes is also being encouraged in the context of some bilateral trade agreements, such as the Thailand-China free trade agreement (which initially covers agricultural products); and
- Some countries, like Singapore (a net importer of FFV), have arrangements with key suppliers (in particular Indonesia and Malaysia) to help ensure that imported FFV comply with high quality and food safety standards. Malaysia and Singapore have a formal bilateral agreement according to which FFV that are certified to be in compliance with Malaysian GAP standards are favoured over non-certified produce in import procedures in Singapore.

Only a relatively small proportion of ASEAN FFV exports go to the European Union (EU): 3 per cent of fresh fruit exports and 12.8 per cent of fresh vegetable exports in 2005 (statistical annex, tables A.4 and A.6). Consequently, the immediate and direct impacts of the EurepGAP standard (and other private sector standards applied in developed-country markets) on ASEAN FFV exports are likely to be relatively small. However, the FFV sector in ASEAN is seeking to enhance exports to the EU market, which is considered a premium market, and EurepGAP certification is expected to become an increasingly important requirement for produce destined for this market. Some data indicate a rapid growth of FFV exports from Thailand and Viet Nam to the EU in recent years. For example, Thai FFV exports to the EU market as a share of its total FFV exports increased from 9.4 per cent in 1999 to 12.7 per cent in 2005 (in value terms).

The UNCTAD secretariat has been implementing the project "Reflecting National Circumstances and Development Priorities in National Codes on Good Agricultural Practices that can be Benchmarked to EurepGAP" with a view to assisting developing countries in examining the challenges and opportunities arising from the EurepGAP standard and weighing the pros and cons of possible benchmarking of national GAP programmes. This project, which is being implemented under the umbrella of UNCTAD's Consultative Task Force on Environmental Requirements and Market Access for Developing Countries (CTF), focuses on the FFV sector. This sector has been selected because it offers a multitude of opportunities for economic and social development gains, while at the same time facing enormous challenges due to increasingly stringent government regulations and voluntary private sector standards, which affect small-scale farmers in particular. The project pays special attention to the EurepGAP standard because it offers an interesting case study of the increasingly important role of private sector standards in the marketplace. The results of the project also help the CTF in providing a forum for a variety of stakeholders to discuss the possible trade impacts of key private sector standards and for the exchange of experiences on proactive adjustment policies for adapting to new trends that may affect access to global markets. In addition, the studies have contributed inputs to national and subregional stakeholder discussions on trade and development aspects of national GAP schemes and to a joint UNCTAD-WTO informal information session on private standards, which was held on 25 June 2007 on the sidelines of the summer session of the SPS Committee of the WTO.[6]

The following case studies have been carried out in South-East Asia:

Malaysia	Christie F. Robert and Sathianathan Menon, QA PLUS ASIA-PACIFIC sdn. bhd.
Thailand	Vicha Sardsud, Post-harvest Technology Institute, Chiang Mai University.
Viet Nam	Phan Thi Giac Tam, team leader, Le Thanh Loan, Trinh Thuc Hien, Hoang Thi Thuy, Nong Lam University, Ho Chi Minh City.

These studies address a number of common issues from a trade and development perspective, paying special attention to the needs of small producers, including:

[6] For more information, see: www.unctad.org/trade_env/ctf.

- The implications of the EurepGAP Fruit and Vegetables standard and other GAP programmes for key stakeholders (producers, exporters, governments);
- The options available, taking into account national conditions and priorities, in the development of national GAP programmes, whether or not benchmarked to EurepGAP; and
- The pros and cons of different options for EurepGAP certification (such as direct certification of individual producers, group certification and benchmarking of national GAP programmes) and the development of national interpretation guidelines.

The first drafts of these studies were prepared by local experts, based on information collected through a series of interviews with officials from government agencies and actors in the value chain (growers, collectors and exporters) in each country, conducted mostly in October and November 2005. These draft studies were discussed at national and regional workshops conducted at the end of 2005 and in 2006. The studies presented in chapters IV-VI update part of the information and analysis contained in the original studies, and incorporate comments from national and international experts.

GAP standards: the ASEAN context

The case studies show some specific aspects of the experiences of ASEAN countries compared to those of developing countries in Africa and Latin America, including:

- The very large role of regional markets (including intra-ASEAN trade) in FFV exports from ASEAN countries and the low share of FFV exports going to the EU market, which results in lower direct exposure to the requirements of the EurepGAP standard;
- The large share of minor fruit crops and "other vegetables" in FFV exports of countries like Viet Nam, Thailand and Malaysia, compared to other developing countries. For example, in Latin America exports mainly are off-season fruit and major tropical fruit categories. By contrast, minor tropical fruit accounted for 95 per cent of Viet Nam's fresh fruit exports in 2003 and 85 per cent of Thailand's fresh fruit exports in 2005. These exports to certain markets may be particularly vulnerable to recent developments in pesticide regulations which restrict the number of active substances that may be used in pesticides applied to specific crops, a measure that tends to affect minor crops in particular (Pay, 2005; UNCTAD, 2006). Consequently, registration and appropriate use of pesticides are very important objectives of any GAP scheme developed in the ASEAN region; and
- The leading role played by governments, especially in Malaysia and Thailand, in the development of national GAP schemes[7] and a related range of innovative instruments to facilitate smallholder involvement in local supermarket supply chains of FFV.

Given the above, ASEAN countries' approaches to the development of GAP schemes have tended to differ from countries in other regions where EurepGAP compliance may be a more important and immediate requirement for exports. The case studies on Malaysia and Thailand propose a gradual approach, starting with a scheme focusing on national food safety objectives, with major government involvement, which would subsequently be used as a basis for the development of local or even national "premium" GAPs that would mainly aim at facilitating access to key export markets.[8] In Malaysia, considerable upgrading has already taken place through the development of a Malaysian Standard for GAP (MS-GAP) and the revision of SALM.

A key challenge in the further development of national GAP schemes is to adequately balance the requirements of domestic, regional and international markets, based on a realistic assessment of priorities and capacities in each country.

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[7] In Latin America, Brazil's Programme for Integrated Fruit Production (PIF, for its Portuguese acronym) is a Government-owned GAP programme (See UNCTAD, 2007b).

[8] Interestingly, the modern retail sector in some ASEAN countries may also be following a gradual approach. An example is the implementation of TESCO's quality assurance programme on primary production, which is based on EurepGAP, in Thailand. For implementation in this country, TESCO Lotus has removed several criteria and control points from EurepGAP in order to make compliance more amenable to a wide group of farmers. It will gradually introduce these criteria over a period of five years and in effect pull their suppliers up to the EurepGAP standard eventually (Wipplinger, Phongsathorn and Watankeeree, 2006).

In Malaysia, the Department of Agriculture has recently decided to seek benchmarking of the SALM standard against the EurepGAP protocol for fruit and vegetables. In Thailand, government institutions and the private sector are working together to develop ThaiGAP, a quality standard for agricultural production equivalent to stringent GAP standards in international markets, which could eventually be benchmarked to EurepGAP.

Benchmarking national GAP schemes to the EurepGAP standard may be useful in promoting greater recognition of such schemes in European markets. It may also play a certain role in responding to increasingly stringent requirements by supermarkets in South-East Asia. Yet the large majority of FFV farmers in South-East Asia, including those already certified under national GAP schemes, produce largely for the domestic and/or regional markets. Therefore, the gradual upgrading of national schemes to respond to new requirements seems to be a valid approach. The challenge is to implement the more stringent standards that can be benchmarked against EurepGAP in a manner that does not create an unnecessary additional burden on small-scale farmers who produce largely for the domestic and regional markets. This could be done by adopting gradual and/or multi-tier approaches. Such a process should take into account the evolving needs of domestic and external markets as well as evolving national capacities (such as skills of producers, infrastructure, and inspection/auditing and certification capacities) and it should be accompanied by measures aimed at making implementation cost-effective and affordable for small-scale growers.

Organization of the chapters

This monograph is organized as follows. The rest of this chapter describes key private sector voluntary standards (PVS) and standards of the International Organization for Standardization (ISO) that may have implications for international trade in FFV. It also briefly analyses the possible implications of both mandatory government regulations and PVS – particular with regard to food safety – for FFV exports from ASEAN countries. In addition, it briefly raises the issue of potential impacts of local supermarket procurement policies and quality standards on growers. Chapter II analyses the structure of trade flows of ASEAN FFV exporters, in particular Malaysia, Thailand and Viet Nam. The objective is to place the analysis of possible trade implications presented throughout this monograph within a common context, using comparable data. Chapter III presents a synthesis of key issues raised in the country case studies and related activities carried out as part of the UNCTAD project. It also reflects on some complementary analyses by the editors. Chapters IV to VI provide more detailed analyses of the national experiences of Malaysia, Thailand and Viet Nam, based on the country case studies. Chapter VII summarizes key developments in the last few months, and elaborates on the way forward. Finally, the statistical annex offers additional data of relevance to the analyses.

Private sector standards and FFV exports of developing countries

Key private sector standards

There is no provision in the food safety legislation of most countries (including those of the EU) that requires producers or exporters in third countries to certify their food quality system. However, the export, import, retail and food processing sectors are turning increasingly to the use of third-party certification services to make sure their suppliers use quality management systems that assure the integrity, traceability, safety and quality of the food products they purchase. In addition, certain regulatory requirements in developed countries that under WTO rules cannot directly be applied to producers in third countries are being transmitted to suppliers in other countries, including ASEAN countries, through the supply chain.[9]

Compliance with private sector standards is not mandatory. However, since retailers and importers often require certification before selecting suppliers and placing orders, private sector standards,

[9] For example, the traceability provisions of Regulation EC/178/2002 do not have an extraterritorial effect outside the EU. However, the regulation makes the importer responsible for compliance with the provisions. A guidance document recognizes that it is common practice among some EU food business operators to request suppliers in third countries to meet the traceability requirements, even beyond the "one step back-one step forward" principle. Thus, even though such requirements are not established by the regulation, they are often a part of the food business's contractual arrangements.

including standards for GAP may, in certain cases, act as de facto mandatory requirements. Thus the impact of private sector standards on good agricultural practices in international markets and on the participation of developing-country producers and exporters in supply chains, including in the FFV sector, has generated an increasing body of research, for example by the World Bank, the Organisation for Economic Co-operation and Development (OECD), UNCTAD, the FAO, regional organizations and donors. The issue has also been discussed in the WTO Committee on Sanitary and Phytosanitary Measures (see below).

Private standards can be divided into two categories: collective standards (e.g. EurepGAP) and retailers' specific standards (e.g. Tesco Nature's Choice). Standards can be either pre-farm gate or post-farm gate (table 1). For example, EurepGAP is a collective standard at the pre-farm-gate level developed by a coalition of retailers.

Table 1. Selected private sector standards and codes in the marketplace

	Pre-farm gate	Post-farm gate	
		Food processing	Retail outlets and supermarkets
Collective standards	SQF 1000 EurepGAP Freshcare Code of Practice (Australia)	SQF 2000 BRC Global Standard Dutch HACCP International Food Standard ISO 22000	SQF 3000
Retailer-specific standards	Tesco (Nature's Choice) Marks & Spencer (Field-to-Fork) Auchan (Filière Agriculture Raisonnée) Carrefour (Filière Qualité)		

Source: Adapted from Chia-Hui Lee, 2006 and Henson, 2006.

The following are some of the most important standards affecting FFV exports, in particular to the EU, Australia and the United States:

- EurepGAP: A pre-farm-gate standard that covers the agricultural production process of the certified product, from pre-planting to harvesting. The EurepGAP certification scheme is considered a supply chain partnership of retailers, produce suppliers/growers and associate members from the agricultural input and service sectors (for more information, see: www.globalgap.org);
- BRC (British Retail Consortium): The BRC has developed post-farm-gate food technical standards to be used to evaluate manufacturers of retailers' own-brand food products;
- Nature's Choice (United Kingdom): Established by the supermarket chain, Tesco, this standard identifies key principles and practices for Tesco's producers and suppliers of FFV in order to ensure that the production and produce handling systems are safe, sustainable and environmentally responsible. The standard can be implemented gradually, based on its bronze, silver and gold categories;
- The Assured Produce scheme (United Kingdom): Founded by the country's National Farmers' Union in conjunction with seven retailers, this initiative seeks to assure consumers that fresh produce is grown in an environmentally sensitive manner, in particular using reduced amounts of pesticides. The scheme currently covers 45 crops, for which it has developed specific protocols;
- Safe Quality Food 2000 (SQF 2000): Administered by the Food Marketing Institute (United States), it is recognized by the Global Food Safety Initiative, a retailer-driven initiative founded by the Food Business Forum. It provides a code that specifies food safety and quality system requirements to be used for all sectors of the food industry. The objective is to supply food that is safe and meets quality and legislative requirements. The standard applies the concepts and principles of hazard analysis and critical control points (HACCP), good manufacturing practices (GMPs), good hygiene practices (GHPs) and GAP. It is used mainly by United States and Australian retailers. SQF 1000 is the standard for pre-farm gate and SQF 3000 for retail outlet levels;

- Freshcare is a national, on-farm food safety programme for the fresh produce industry in Australia.[10] Based on HACCP principles, Freshcare links food safety on the farm to the quality and food safety programmes of the other members of the fresh produce supply chain. While the basic Freshcare Program addresses food safety issues, additional (optional) modules are being developed for the management of environmental practices and on-farm safety/welfare issues. Freshcare claims that for those members for whom EurepGAP compliance is an export requirement, Freshcare provides an option to demonstrate EurepGAP equivalence;
- The Dutch HACCP Code is a technical specification that provides a basis for compliance of a HACCP-based food safety system with international and national legislation and codes of practice within a management system framework. It has been designed by the Dutch National Board of Experts, which is made up of government enforcement and trade agencies, food retailers, food producers and processors, trade associations and consumer organizations. It is particularly relevant for food companies that supply food products to the Dutch market, regardless of product or country of origin; and
- The International Food Standard (IFS) Version 4 has been designed as a uniform tool to ensure food safety and to monitor the quality of retailer-branded food products. In practice, IFS is a common food safety standard with a uniform evaluation system to check whether a supplier is capable of supplying a safe food product according to specifications and in conformity with the legislation. It has been developed by HDE (German Retailers Services Association) with the cooperation of the French FCD (Fédération des entreprises du Commerce et de la Distribution), and is increasingly used by German and French retailers. The standard can apply to all steps of food processing.

Also of note is the Global Food Safety Initiative (GFSI). It is not intended to be applied as a code in its own right. Instead, it compiles a set of "key elements", including food safety management, GMP, GAP and HACCP. These elements serve as the requirements against which existing private food safety standards can be benchmarked. It was established in 2000 by a group of over 50 retailers worldwide (controlling approximately 65 per cent of food retail revenue globally) to help reduce multiple auditing costs incurred by different industry-wide schemes.

ISO standards

To help harmonize food safety and quality standards, a number of standards have been developed by the ISO:

- ISO 9001:2000 specifies requirements for a quality management system for any organization that needs to demonstrate its ability to consistently provide products that meet customer requirements and applicable regulatory requirements, and aims to enhance customer satisfaction. In addition, ISO 9001 is designed to be compatible with other management systems' standards and specifications, such as OHSAS 18001 (Occupational Health and Safety) and ISO 14001 (Environmental management). ISO 9001:2000 is a widely implemented standard for quality management systems, although it does not specifically address food safety.
- ISO 22000:2005 specifies requirements for a food safety management system. It is applicable to all organizations, regardless of size, which are involved in any aspect of the food chain and want to implement systems that consistently provide safe products. The standard has three parts: (i) prerequisite programmes[11]; (ii) HACCP principles; and (iii) management system requirements. ISO 22000 is a specific standard for food processors, which sets out safety management procedures.

National (and regional) GAP schemes in ASEAN

A number of initiatives are under way in ASEAN countries to promote domestic and regional (ASEAN-wide) GAP standards and/or guidelines. The existing national schemes of Malaysia and Thailand are examined in Chapters IV and V respectively. Progress in the development of local schemes in Viet Nam is analysed in Chapter VI.

[10] www.freshcare.com.au/directory/shop.asp?site=303.

[11] Prerequisite programs (PRPs) are the conditions that must be established throughout the food chain and the activities and practices that must be performed in order to establish and maintain a hygienic environment.

Other national systems in ASEAN countries, not all of which were fully operational at the time of drafting this monograph, include Indonesian Good Agricultural Practices (IndonGAP); Good Agricultural Practice for Vegetable Farming (GAP-VF) Singapore and DA-GAP Philippines, owned by the Department of Agriculture (APEC secretariat, 2006). In addition, a regional approach to GAP is being explored under the auspices of the ASEAN secretariat (box 1).

A common characteristic of almost all these schemes is that they are government-driven and focus mainly on the domestic market. Singapore's GAP-VA may be an exception, as it largely aims at promoting shared responsibility between the Government and the private sector (in particular importers and foreign producers) in ensuring the safety of FFV consumed in Singapore (mainly imported as the country is not a major FFV producer) and/or re-exported by that country. With regard to Viet Nam, donor projects play a key role in assisting local GAP initiatives and efforts aimed at EurepGAP certification, in particular in southern Viet Nam.

Food safety is a key issue in all schemes, the prime focus being on safe use of agrochemicals, with little or no attention to microbial contamination. Issues beyond agrochemicals are included gradually. Under the Thai scheme, for example, farmers are assessed at three levels: (i) production processes for safe products (appropriate use of agrochemicals); (ii) production processes for safe and pest-free products; and (iii) production processes for safe, pest-free and quality products. Environmental and workers' welfare issues currently receive less priority in some schemes (e.g. in Thailand), but are gradually being incorporated. The Indonesian scheme, which is not yet fully operational, also recognizes three different levels: the lowest level guarantees compliance with food safety criteria only, whereas the highest level concerns safety, quality and environment-friendly production processes.[12] The SALM scheme in Malaysia already includes criteria concerning environmental issues and workers' health and safety.

With the exception of Singapore's scheme, governments provide subsidies to assist producers to participate in their national schemes.[13]

Possible implications of private sector GAP standards for ASEAN FFV exports

In most regional markets, such as those of Japan, China and Taiwan Province of China, the most important challenge for ASEAN FFV exporters is to meet public-sector SPS regulations. These markets are primarily concerned with issues such as plant diseases, insect problems and the level of pesticide residues in fruit and vegetables. Private sector standards appear to be less important. Two major reasons are that in the two main export markets in the region, China and Japan, supermarket concentration is very low (the 7-10 leading supermarket chains have a share in total retail value of below 10 per cent), and small farmers and companies still play a major role in production, trade and retail.[14]

[12] The different categories are known as "primas". Farms can be certified as Prima 3 (P-3), the lowest standard, if assurance can be given only with regard to applying practices to supply safe food (i.e. meet MRL requirements); the P-2 category is to be used for farms that apply practices for safe food and quality; and the P-1 category is reserved for farms which apply practices for safety, quality and environment-friendly production processes. The Prima I level broadly complies with EurepGAP requirements (Wibawa, 2005).

[13] Singapore provides technical cooperation to Indonesia, its principal supplier, to promote the production of safe vegetables for export to Singapore.

[14] Some developments may gradually change this situation. In Japan, the use of private-sector quality and food standards may change as retailers respond to consumer concerns, look for new tools of supply chain management, and reduce liability costs. For example, Aeon Group is one of Japan's largest retailers and has recently become a EurepGAP member. It is likely that this Group and other large retailers will move towards requiring compliance with EurepGAP or JGAP. In China, the growth of retailers such as hypermarkets and chain stores, and the expansion of international retail corporations may result in increasing demand for quality assurance and centralized supply management of imports (UNCTAD, 2007a).

Box 1. An ASEAN-wide quality assurance system

Various ASEAN countries have expressed an interest in an ASEAN-wide quality assurance system based on food safety requirements. The standards sought by these countries would be at least as high as the systems that are currently in place at the national level. A common ASEAN GAP is currently being prepared with the assistance of two Australian experts as part of the ASEAN-Australia Development Cooperation Program Stream – Quality Assurance Systems for ASEAN Fruit and Vegetables Project.

The purpose of ASEAN GAP is to enhance the harmonization of GAP programmes within the ASEAN region. It is expected that this will facilitate trade between ASEAN countries and from them to global markets, make GAP more viable for farmers, and help sustain safe food supply and the environment. The scope of ASEAN GAP covers the production, harvesting and post-harvest handling (in locations where produce is packed for sale) of FFV.

To develop ASEAN GAP, a series of three workshops was held involving representatives from the ASEAN member countries and the Australian project team. The initial workshop drew on experiences with implementing GAP programmes in Malaysia, Thailand, Singapore and the Philippines. GAP systems and guidelines for GAP from other countries were also reviewed. Subsequent workshops refined the standard to help ensure that the recommended practices were relevant and achievable by all member countries and consistent with existing GAP programmes.

ASEAN GAP consists of four modules covering food safety, environmental management, workers' health, safety and welfare, and produce quality. Each module can be used alone or in combination with other modules. This enables progressive implementation of ASEAN GAP, based on individual country priorities.

Many GAP systems and guidelines for GAP from around the world were reviewed in the preparation of ASEAN GAP. The main sources of information were Malaysia's SALM, Thailand's Q-GAP, Singapore's GAP-VF, EurepGAP control points and compliance criteria, the Freshcare On-Farm Code of Practice, Food Safety and Environment modules (Australia) and Guidelines for On-farm Food Safety for Fresh Produce, Department of Agriculture, Fisheries and Forestry, Australia.

Source: ASEAN secretariat and the Australia Development Cooperation Program, Good agricultural practices for production of fresh fruit and vegetables in the ASEAN region. Quality Assurance Systems for ASEAN Fruit and Vegetables Project. For further information, see: www.aphnet.org/gap/ASEANgap.html.

In other markets, in particular in Europe, private sector standards, including GAP standards, are already important requirements and can have fairly important trade implications.[15] Although only a small proportion of the total FFV exports of Malaysia, Thailand and Viet Nam go to the EU, for specific products the EU market may be relatively important. For example, according to the Thai study, in 2004 around 46 per cent of the country's exports of baby corn went to the EU market. Similarly, 42 per cent of Malaysia's exports of "other fresh fruit" (HS 081090) went to that market (in value terms). For the Australian market, SQF 2000 and the Freshcare Code of Practice are relevant standards.

[15] An ongoing FAO study on the use of private-sector voluntary standards in European markets indicates that EurepGAP is the most important standard for GAP, and the Global Food Standard of the British Retail Consortium (BRC) for packing/handling. Although, increasingly, private standards will become essential, most importers also buy non-certified products, and so do supermarkets (including EurepGAP members), depending on product availability and price. For most importers, the main criteria for supplier selection are: (i) quality (including packaging); (ii) availability and continuity of supply; (iii) trust/relationship; and (iv) certification. Usually, certification is not a major criterion, especially for products in the lower price ranges. Demand for private-sector standards depends on markets: they are essential for large supermarkets and less so for wholesalers, smaller supermarkets, street markets and ethnic/specialty outlets, although their importance is growing in those sectors too. It therefore follows that EurepGAP certification will become increasingly important for sales to European retailers. However, there are opportunities for non-certified products as well, which makes it important to implement GAP even if this does not result in commercial certification (Santacoloma, 2007).

However, the trade effects of private sector GAP standards are difficult to estimate. Where they are an important factor in the marketplace there may be negative effects, for example if adjustment costs are high, if compliance criteria discriminate against foreign producers and/or if there is a need to comply with multiple standards, thereby causing a rise in transaction costs. On the other hand there can be positive effects if compliance facilitates market access or provides a competitive edge to producers/exporters.

In general, adjustment costs required to comply with the EurepGAP standard or other codes for GAP (including government-driven national GAP schemes in ASEAN countries) depend, among other things, on the stringency of specific control points and compliance criteria, availability of certification infrastructure, laboratories and other facilities, whether or not training and extension services are provided by government institutions and others, and whether or not government support is provided (for example for certification costs). The content and stringency of a specific standard may change over time. For example, the third version of the EurepGAP Standard for Fruit and Vegetables incorporates 14 new control points for on-farm produce handling in packhouses, implying enhanced food safety hygiene and quality requirements. This may increase compliance costs. Other changes, such as the introduction of a common standard across sectors may offer advantages, for example to small-scale growers practising mixed agriculture, as many do in Malaysia (box 4).

GAP implementation requires investments at both the macro level and the farm level (Santacoloma, 2007). Investments at the macro level may be required, for example, for the installation or maintenance of local accreditation or certification systems, laboratory analysis and laboratory accreditation, documentation and record-keeping systems, business development services, input supply services/input regulations, and training and technical assistance.

The initial investment required at the farm level includes: basic pesticide/fertilizer storage, toilet and hand washing facilities, personal protective equipment, better post-harvest handling boxes, possible higher costs for better input products, costs for installing protection against drifting of pesticides, insurance for employees and storage of covered packaging. Depending on the existing facilities before GAP compliance, some of these investments (e.g. in storage facilities for fertilizers and crop protection products) may be significant. OECD country studies found that up-front costs to upgrade a farm to enable it to meet GAP requirements may often be the major cost element (OECD, 2006). Recurrent costs may also be significant, such as the costs of training, certification and laboratory analysis.

Both in Malaysia and Thailand the Government covers most of the costs of certification and testing and provides training free of charge to facilitate farmers' participation in national GAP schemes, but such assistance is usually not available for certification against other GAP standards, such as EurepGAP (and in any case it is not viable in the long run).

It has been observed that European importers and retailers do not always request EurepGAP certification. For example, Malaysian fruit exporters to the port of Rotterdam in the Netherlands have so far not been required to demonstrate EurepGAP certification.

Experience (e.g. from Latin American countries with significant FFV exports to the EU) shows that, in general, large producers and exporters have managed to achieve EurepGAP certification when necessary. However, small-scale producers tend to face major difficulties in meeting those requirements (UNCTAD, 2007b).

Although GAP certification may result in additional costs it usually does not result in price premiums for producers. Meeting high quality and food safety standards may however provide developing countries with a competitive edge in specific FFV. National GAP schemes can play a role in helping producers to meet food safety and pesticide residue requirements, and credible GAP certification, in combination with other measures (such as mandatory certification of pesticides residues), and may thus facilitate market access. In addition, national GAP schemes and private voluntary standards can serve as catalysts for development. According to Henson and Jaffee (2006: 618), it is important to treat compliance as a strategic issue, so that the opportunities and challenges are managed to competitive advantage, or at the very least they minimize competitive disadvantage. As Vorley, Fearne and Ray

(2007: 199) correctly point out, however, the key question is not whether higher standards of food safety are a good thing; rather it is the level of standards, the rate of change and the means by which they are introduced that counts. They emphasize that in many cases decisions relating to quality and food safety are made with poor or no consideration for the supply chain impacts. Clarity of purpose, awareness, consideration of the implications upstream and a strategy for managing change are essential. Unfortunately, this seems to be the exception rather than the rule in most of the developing countries reviewed by UNCTAD, not only those in South-East Asia.

Possible impacts of the rise in local supermarkets

Apart from the impact that private sector standards of international markets can have on exports, domestic market standards, such as those applied by local supermarkets, can have significant potential impacts on growers.[16] This issue has received little attention in the country case studies, but has been discussed in FAO studies. The impacts on growers result, in particular, from the method of procurement, the logistics used and the quality standards applied by supermarkets (Chen, Shepherd and da Silva, 2005). FAO studies show that supermarkets in Asia employ a variety of FFV procurement practices (box 2). With regard to quality standards, some have argued that supermarkets are becoming as concerned with safety and quality as they are with costs. Consequently, they have begun to insist that suppliers comply with standards similar to those of EurepGAP (Chen, Shepherd and da Silva, 2005).[17]

Farmers face a number of problems in supplying supermarkets. In many respects, these problems are similar to the obstacles to GAP implementation and, in particular, to meeting the requirements of private sector GAP standards of international markets, as identified in the country case studies. In some cases, this has already resulted in a rapid decline in the numbers of suppliers involved in supermarket supply chains in South-East Asia, as companies tend to de-list suppliers that do not meet expectations in terms of volume, quality and delivery. In Malaysia, for example, the number of vegetable suppliers to the Giant chain fell from 200 in 2001 to just 30 in 2003. Similarly in Thailand, following the introduction of a supply chain improvement programme by the supermarket chain TOPS in 1998, the number of TOPS' suppliers shrank from 250 to 60 (Vorley, Fearne and Ray, 2007: 7). Although these numbers have to be analysed with care,[18] the implications for farmers are clear: price competition between supermarket chains makes them reluctant to pay higher prices which would enable farmers to pay for on-farm investments. Farmers' margins are likely to be squeezed further if supermarkets begin to insist that suppliers comply with standards similar to those of EurepGAP.

Governments can play an important role in facilitating linkages between supermarkets and farmers. For instance, FAMA of Malaysia has an active programme for promoting farmer-supermarket linkages, and works on improving distribution channels. In Thailand, the Bureau of Agricultural Economics

[16] Chen, Shepherd and da Silva, (2005) observe that while the quantities sold by supermarkets can be accurately calculated, in most countries it is almost impossible to know the quantities of fruit and vegetables sold through traditional market channels. Available data suggest that in Malaysia supermarkets and hypermarkets accounted for 60 per cent of fruit sales and 35 per cent of vegetable sales in 2002, although this may be an overestimate. In Thailand, some 40 per cent of fruit and 30 per cent of vegetables were sold through supermarkets and hypermarkets in the Bangkok area. According to Boselie and van de Kop (2007), this is estimated to represent only 5 per cent of nationwide sales. However, Chen, Shepherd and da Silva note that the impacts of the rise of supermarkets on sales of domestically grown FFV may be lower than many observers might expect, for a number of reasons: (a) institutions and caterers may bypass the retail sector; (b) the growth of FFV sales by supermarkets tends to lag behind the growth of sales of processed food products; (c) a significant proportion of FFV sold in supermarkets may be imported; and (d) supermarket supply chains may be relatively easy to develop for less perishable produce, such as watermelons, but more difficult for produce that has a limited shelf life and requires cold chains. Indeed, many smaller supermarkets stock only those products that have a long shelf life.

[17] In response to this development, in October 2004, the FAO, the Federal Agricultural Marketing Authority of Malaysia (FAMA) and the Association of Food and Agricultural Marketing Agencies in Asia and the Pacific (AFMA) brought together supermarket representatives, wholesalers, government officials, farmers' representatives and those who work with farmers at a workshop on The Growth of Supermarkets as Retailers of Fresh Produce held in Kuala Lumpur.

[18] Boselie and Kop observe that "there were various reasons for farmers/suppliers to exit the relationship with domestic supermarket chains. A small portion moved upwards to the export markets (a few TOPS suppliers became suppliers to the Ahold subsidiary in the Netherlands). Another category started supplying competing supermarkets and others switched to traditional wetmarkets or terminated their business" (in Vorley, Fearne and Ray, 2007, page 63).

Box 2. Procurement and distribution practices of supermarkets in South-East Asia

According to FAO studies, supermarkets in Asia use a variety of FFV procurement practices. The following are some example from the three countries analysed in this monograph:

- Direct purchases from farmers;
- Purchases from farmers through distribution centres (such as the one established by TOPS in Thailand for fresh produce);
- Purchases from wholesalers, who either work directly with farmers or through wholesale markets. For example, there are six specialized wholesalers in the Talad Thai market in Bangkok (the largest fruit and vegetable wholesale market in the country) that deliver to supermarket chains. To address the concerns of supermarkets for safe produce, in particular those related to pesticide residues, Talad Thai plans to establish a laboratory for pesticide testing in the market;
- Purchases through independent procurement companies (dedicated suppliers) who often work with farmers approved by the supermarket chains (preferred suppliers);
- Purchases through government-sponsored distribution centres. In Malaysia, for example, the Federal Agricultural Marketing Authority of Malaysia (FAMA) operates 44 collection centres which channel produce into seven distribution centres for delivery to supermarket stores (see also chapter IV);
- Purchases through informal farmer groups, farmer associations or cooperatives. In Viet Nam, for example, Saigon Coop, a Vietnamese-owned chain that presently has 13 stores of which 11 are in Ho Chi Minh City, buys from seven main suppliers (including one farmers' cooperative), large farms and traders;
- Purchases through large individual farmers, who often subcontract part of the supply to smaller farmers. In Malaysia for example, Khan, a company with a vegetable farm and packhouse, started to sell to two supermarket chains and to one supermarket/distribution centre in Singapore in 2001. Half of the company's vegetables come from its own farm and the other half from contracted farmers. The company supplies all seeds, fertilizers and pesticides to the individual farmers to ensure quality and safety. In addition, some supermarkets are leasing space within the store on a commission basis to traders, farmers and cooperatives.

Source: Chen, Shepherd and da Silva, 2005.

has opened a supply chain unit, and a government-sponsored distribution centre for local retailers has been set up. The Thai Government has also set up the Allied Retail Trade Corporation (ART), a State-owned operator of franchised shops. Like FAMA, ART consolidates supplies from small producers. It also broadens the range of goods offered to small grocers beyond basic consumer goods (Vorley, Fearne and Ray, 2007: 204).

Supermarket chains, whether or not in cooperation with donors, can also help local suppliers meet high standards. For example, Metro in Viet Nam has established its own standards with which farmers have to comply if they wish to sell their fresh produce to Metro stores. In addition, Metro, with German support, is attempting to provide local suppliers with the skills and techniques they need to meet high standards in agriculture and aquaculture (Vorley, Fearne and Ray, 2007). In Thailand, TOPS supermarkets have implemented a supply chain improvement programme since 1998 (for more details, see Vorley, Fearne and Ray, 2007:7).

II. ASEAN TRADE IN FRESH FRUIT AND VEGETABLES

This chapter analyses regional patterns of FFV exports of ASEAN countries in general and Malaysia, Thailand and Viet Nam in particular. It also analyses trends in some key markets for these countries. Such analyses help to better understand, a priory, the trade implications of GAP standards for the concerned countries.

Trade data presented here focus on Harmonized System (HS) Chapters 7 (vegetables) and 8 (fruit and nuts). These two HS chapters roughly contain the same products as the indicative product crop list annexed to the EurepGAP Fruit and Vegetables standard.[19] However, for the purpose of the analysis presented here, trade data exclude manioc (cassava). This is because very large swings in Thai manioc exports in recent years (with a dramatic decline in exports of pellets to the EU and a large increase in their exports to China) must be attributed to EU and Chinese trade policy measures that are unrelated to the issues discussed here. Also, whereas cassava is an important item for human consumption, the overwhelming share of the region's cassava production for export (Thailand and Viet Nam being important exporters) is for animal feed rather than for human consumption, but statistics available in COMTRADE do not allow a distinction to be made between the two categories.[20] Chapter 8 is broken down into nuts (HS 0801-0802) and the narrower category of fruit excluding nuts (HS 0803-0814). This breakdown is particularly important in the case of Viet Nam, where nuts represented some 65–75 per cent of the country's FFV exports in value terms in 2005. Some data are also presented on processed fruit and vegetables (HS chapter 20).

While the statistical analysis focuses on Malaysia, Thailand and Viet Nam, some reference is also made to the experiences of the six major ASEAN exporters (i.e. including Indonesia, the Philippines and Singapore) as a group. Malaysia and Thailand have reported trade data using the HS nomenclature,[21] and the most recent information at the time of writing was for 2005.[22] Viet Nam has only reported trade data relating to SITC Rev3, which is nevertheless closely correlated with the HS nomenclature. The most recent information for Viet Nam is for 2003. Export data presented here are therefore based on COMTRADE, using HS version 1996 in the case of Malaysia and Thailand and SITC Rev.3 in the case of Viet Nam.[23] Additional (and more recent) information for Viet Nam uses import statistics reported to COMTRADE by trading partners as a proxy. Some data on EU imports (in value and volume terms) are from the European Commission's online Export Helpdesk for developing countries.

ASEAN FFV exports

The combined FFV exports of the six leading ASEAN FFV exporters amounted to $2 billion in 2005, of which fruit (excluding nuts) accounted for $914 million (45 per cent of total FFV exports), vegetables for $432 million (34 per cent) and nuts for $687 million (21 per cent).

A very large proportion of fruit exported by ASEAN appears in HS statistics as "other fruit": HS 081090 (fresh and chilled), HS 081190 (frozen), HS 081290 (provisionally preserved) or HS 081340 (dried). These subheadings cover a large range of fruit, which may vary from country to country, such as starfruit, durians and rambutan in Malaysia, longans, durians and lychees in Thailand, and dragon fruit in Viet Nam (chapters IV–VI). For example, 85 per cent of Thai fresh fruit exports, in value terms, consist of "minor" fruit.[24] Some of these items are gaining in importance in international trade, but are not yet separately specified within international trade statistics (although HS-2002 includes a

[19] EurepGAP General Regulations Fruit and Vegetables Version 2.1-Oct04, Annex 7.11: EurepGAP Product Crop List.

[20] It should be noted, however, that cassava is one of the products specifically covered by the Thai GAP standard and that several private-sector standards refer to food for both human and animal consumption.

[21] Brunei Darussalam, Cambodia, Indonesia, the Philippines and Singapore have also reported trade data to COMTRADE. Exports of Brunei Darussalam and Cambodia are very small and cover only some years.

[22] Trade data for Malaysia presented in Chapter IV and the statistical annex have been updated incorporating data for 2006.

[23] Using WITS (World Integrated Trade Solution), an online system developed by the World Bank.

[24] For all developing countries as a group, off-season fruit (in particular apples, pears, grapes and citrus fruit) constitute the largest category of fresh fruit exports (60 per cent in value terms), followed by "major" tropical fruit categories comprising bananas, pineapples, avocados, mangoes and papayas (35 per cent), and "minor" fruit (5 per cent).

separate subheading for durians: HS 0810600).[25] ASEAN countries also export some types of "major" tropical and off-season fruit, but their share in total fresh fruit exports is much lower than for most other developing countries such as those in Africa and Latin America.

The main vegetables exported by ASEAN countries are onions and shallots, garlic, asparagus, beans and mushrooms. Like ASEAN fruit exports, a large share of ASEAN vegetable exports belong to HS subheadings under "other vegetables", in particular HS 070990 (fresh), HS 071080 (frozen), HS 071190 (provisionally preserved), HS 071290 (dried; mixtures of vegetables) and 071390 (dried). For example, 75 per cent of Thai vegetable exports consist of items classified as "other vegetables" (which include baby corn).

The principal nuts exported by ASEAN countries, in particular Viet Nam, are cashew nuts followed by coconuts. Unlike most other FFV items, a large share of exports of nuts is directed to developed-country markets.

Table 2. ASEAN: Exports of FFV by principal markets, 2005

	World	Key regional markets					Other Asian developing countries	West Asia**	EU-15	United States and Canada
		Subtotal	ASEAN	China	Japan	Other*				
	Exports ($ millions)									
ASEAN* **	2 039.5	1 259.5	418.7	243.7	370.3	226.8	166.8	63.3	209.9	204.7
Indonesia	247.1	113.9	89.6	3.5	8.5	12.3	103.5	3.1	6.4	9.9
Malaysia	186.1	159.1	138.6	1.8	0.6	18.1	5.5	6.5	9.5	2.0
Philippines	605.2	399.0	16.7	36.8	248.5	97.1	38.2	34.9	47.5	47.5
Singapore	105.4	66.9	62.9	0.2	0.2	3.5	4.4	1.7	18.1	1.2
Thailand	511.9	360.8	85.9	100.6	101.4	72.9	14.7	12.2	65.3	37.5
Viet Nam	383.7	159.8	24.9	100.9	11.1	22.9	0.5	5.0	63.2	106.6
	Share of market (per cent)									
ASEAN* **	100.0	61.7	20.5	11.9	18.2	11.1	8.2	3.1	10.3	10.0
Indonesia	100.0	46.1	36.3	1.4	3.4	5.0	41.9	1.3	2.6	4.0
Malaysia	100.0	85.5	74.5	1.0	0.3	9.7	3.0	3.5	5.1	1.1
Philippines	100.0	65.9	2.8	6.1	41.1	16	6.3	5.8	7.9	7.9
Singapore	100.0	63.4	59.7	0.2	0.2	3.3	4.2	1.6	17.2	1.1
Thailand	100.0	70.5	16.8	19.6	19.8	14.2	2.9	2.4	12.7	7.3
Viet Nam	100.0	41.6	6.5	26.3	2.9	6	0.1	1.3	16.5	27.8

Source: COMTRADE.

* Hong Kong (China), Taiwan Province of China, Republic of Korea.

** Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen.

*** All ASEAN countries having reported trade data to COMTRADE. Data for Viet Nam are for 2003.

Table 2 shows ASEAN exports of FFV by principal markets in 2005. The share of exports to the main regional markets (61.7 per cent for ASEAN as a group) varies: from 41.6 per cent of Viet Nam's FFV to 85.5 per cent of Malaysia's. Only 10.3 per cent of ASEAN FFV exports (in value terms) went to the EU-15 and only 10.1 per cent to the United States and Canada. These shares are even lower when nuts are excluded, in particular for Viet Nam.

[25] Many "minor" fruit are produced in small quantities, and are destined largely for local or regional markets. Even so, "minor" fruit may still be of considerable economic importance in their respective regional markets. A number of tropical and subtropical fruit are no longer exotic products in world markets, having become firmly established, with guaranteed supply and reasonable prices (FAO, 2004). Some products are becoming increasingly available in Europe, largely as a result of promotional activities and better information to consumers. For example, lychee imports into EU countries grew by about 90 per cent between 1998 and 2002 (FAO, 2003). However, trade in these may still be erratic. EU-27 imports of passion fruit, carambola and pitahaya increased from 6,215 tons in 2000 to 14,088 tons in 2005 (but fell to 8,754 tons in 2006). An estimated 635 tons of durians were imported into the EU-27 in 2000, but this fell to 372 tons in 2006 (European Commission's online Export Helpdesk for developing countries).

A more detailed analysis by major FFV categories is presented in tables A2-A6 (statistical annex). Exports of fresh fruit (excluding nuts) and vegetables go largely to key regional markets, in particular China, ASEAN, Taiwan Province of China, Hong Kong (China) and the Republic of Korea. In 2005, 81.5 per cent of ASEAN's exports of fruit (excluding nuts) and 76.5 per cent of its exports of vegetables went to these markets (both in value terms). For the six ASEAN countries as a group, ASEAN itself was the main market for vegetables, although Japan was the leading market for Thailand and Viet Nam. In the case of fruit, Japan was the leading market, mostly for Philippine exports, while ASEAN was by far the most important market for Malaysia.

FFV production and exports of Malaysia, Thailand and Viet Nam

Production

FAO statistics show that Thailand and Viet Nam are ASEAN's largest producers of fruit and vegetables after the Philippines and Indonesia (table A.1). Malaysia's production is much smaller. From 1979-1981 to 2004, production in Thailand increased by only 25 per cent (in volume terms), and in Malaysia by 46 per cent, whereas in Viet Nam it increased by 165 per cent. Yet during the same period, Thailand's and Viet Nam's production fell as a share of world production and as a share of the production of all developing countries. The situation improved somewhat in 1989-1991 when Viet Nam's share in world production increased and its share in total developing countries' production was more or less stable at 1.2-1.4 per cent.

From 1979-1981 to 2004, ASEAN's production represented around 5 per cent of world production. As a share of total developing countries' production it fell from 9.9 to 6.8 per cent, but this is largely due to the rapid growth of fruit and vegetable production in China. If China were excluded, ASEAN's share in the production of all developing countries increased from 11.1 per cent in 1989-1991 to 12.8 per cent in 2004. This shows that ASEAN has been reasonably successful in expanding its production of fruit and vegetables.

Exports

Malaysia, Thailand and Viet Nam are middle-range FFV exporters. Among the developing countries, Thailand was the 15th largest exporter of FFV and Malaysia the 29th largest (table A.2).

According to export data reported by the three countries to COMTRADE,[26] growth of FFV exports appears to have been relatively slow in Malaysia, more rapid in Thailand and significantly more dynamic in Viet Nam[27] over the period 1997-2005. For example, table A.8 (statistical annex) shows that the share of Viet Nam in world imports of FFV has increased continuously and much faster than that of all developing countries.

Whereas this monograph focuses on exports of FFV that may be directly affected by pre-farm-gate standards, it is also important to note that FFV are also important inputs to food processing industries, and that domestic processing has the potential to contribute significantly to diversification into higher value-added products. Thailand is the fourth largest developing-country exporter of processed fruit and vegetables (HS Chapter 20) after China, Turkey and Brazil, with an export value of $1.1 billion in 2005, which represents 68.5 per cent of total (fresh and processed) fruit and vegetable exports of the country (worth $1.6 billion). In the case of Viet Nam, however, exports of processed fruit and vegetables accounted for only 4 per cent of all (i.e. fresh plus processed) fruit and vegetable exports in 2003 (table 3).

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[26] COMTRADE contains data on exports of Malaysia, Thailand and Viet Nam only for the years indicated below (in US$ millions):

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Malaysia (HS96)	134.8	110.3	147.9	155.4	161.4	172.1	169.7	176.1	186.1	184.7
Thailand (HS96)	n/a	n/a	300.5	362.8	322.0	354.1	383.5	453.9	511.9	n/a
Viet Nam (SITC Rev3)	n/a	n/a	n./a	361.1	422.1	355.9	383.7	n/a	n/a	n/a

Source: COMTRADE.

[27] According to import data of countries that reported trade statistics to COMTRADE (which together represent an overwhelming portion of world trade).

Table 3 shows some basic indicators to support a comparison of the analyses of the three countries presented in chapters IV–VI. The values of total FFV exports in 2005 were $186.1 million for Malaysia and $511.9 million for Thailand, while for Viet Nam (for which only 2003 data are available) the value was $383.7 million. Using import data for all countries that supplied 2005 data to COMTRADE as a proxy, Viet Nam's 2005 exports are estimated at $548.8 million. Using the same methodology, by way of comparison, Malaysia's exports are estimated to have amounted to $153.3 million and Thailand's to $776 million.

The case study on Malaysia indicates that, given the Government's aim to reduce the country's food deficit (including in FFV), trade has been one factor in its policy objective to increase production and exports of FFV (among other product groups). In 2005, Malaysia had a trade deficit in FFV of $347.8 million and a small trade deficit in processed fruit and vegetables. Thailand had a trade surplus of $306.2 million in FFV and a much larger trade surplus in processed fruit and vegetables. Viet Nam had a trade surplus of $284.3 million in 2003, of which $247.1 million represented trade in nuts.

Table 3. Exports of fruit and vegetables, basic data and indicators for Malaysia, Thailand and Viet Nam

	Malaysia (2005)*	Thailand (2005)*	Viet Nam (2003)*	ASEAN	All developing countries
Production of fruit and vegetables (million tons), 2004	1.8	11.3	13.3	73.9	1085.2
Share in world production (%), 2004	0.13	0.82	0.96	1.91	100.0
Share in production of all developing countries (%), 2004	0.17	1.04	1.22	2.43	100
Exports of FFV ($ millions)	186.1	511.9	383.7	2 039.5	29 587.5
Exports of fresh fruit ($ millions)	69.5	288.5	57.5	914.1	14 553.7
Exports of nuts ($ millions)	13.2	24.6	285.0	687.5	4 917.1
Exports of vegetables ($ millions)	103.4	198.8	41.2	437.9	10 129.2
Exports of processed fruit and vegetables ($ millions)	62.6	1115.2	17.6	1 732.5	10 802.3
Trade balance in FFV ($ millions)	-347.8	306.2	284.3	255.0	17 924.3
Trade balance in fresh and processed fruit and vegetables ($ millions)	-366.9	806.2	294.2	1 534.2	24 933.0
Share of the 3 countries in FFV exports of all developing countries (%)	0.63	1.73	1.30	6.89	100
FFV exports as a share of total agricultural exports (%)	2.0	3.9	8.2	4.7	13.7
Share of FFV exports in total exports (%)	0.13	0.46	1.90	0.32	0.95
Share of FFV exports going to the EU-15 (%)	5.1	12.7	16.5	10.3	28.6
Share of processed fruit and vegetables in exports of fresh plus processed fruit and vegetables (%)	25.2	68.5	4.4	45.9	27.0

Source: Own calculations, based on FAO and COMTRADE.
* Unless indicated otherwise.

Main regional markets

Based on import statistics of all countries that reported data to COMTRADE, it is estimated that the value of world trade in FFV was $85.7 billion in 2005, or $60.7 billion if intra-EU trade is excluded. Around 5 per cent of the latter amount corresponded to imports originating from ASEAN countries. In 2005, the share of Malaysia in world imports, in value terms, was 0.27 per cent (down from 0.47 per cent in 1997) and that of Thailand 1.28 per cent (compared to 1.47 per cent in 1997). On the other hand, the share of Viet Nam increased from 0.24 cent in 1997 to 0.90 per cent in 2005. Together, Malaysia, Thailand and Viet Nam supplied 2.45 per cent of world FFV imports (excluding intra-EU trade).

As mentioned earlier, regional markets are very important for ASEAN countries' FFV exports. COMTRADE import data show that Japan, ASEAN, China, Taiwan Province of China, Hong Kong (China) and the Republic of Korea together imported from the world FFV worth $9 billion in 2005 (table 4). Japan is by far the largest market ($4.1 billion), but also the slowest growing market, while China is the fastest growing market.

Of the total $9 billion FFV imports into key regional markets in 2005, almost $2 billion (22 per cent) originated from ASEAN member countries. Imports from Malaysia, Thailand and Viet Nam as a subgroup totalled $882.7 million, or 9.8 per cent of imports from the world. The most important regional markets for these countries in 2005 (in value terms) were, in descending order, ASEAN ($265.2 million), China ($243.5 million) and Hong Kong (China) ($151.7 million). Japan is a relatively less important market, especially for Malaysia and Viet Nam. In the period 1997-2005, there was a rapid increase in imports by China, Japan, ASEAN and Taiwan Province of China from Viet Nam, and of imports by China from Thailand.

Table 4. Main Asian markets for FFV imports from the world, Malaysia, Thailand and Viet Nam, 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Imports from the world ($ millions)									
ASEAN	1 281.1	922.2	1 058.2	1 128.4	1 144.5	1 314.8	1 414.8	1 491.6	1 685.3
China	282.2	281.1	303.0	428.0	423.3	429.4	542.8	679.7	760.9
Japan	3 818.3	3 792.9	4 148.9	4 139.8	3 834.1	3 636.8	3 801.4	4 201.1	4 144.8
Other*	1 735.6	1 518.2	1 533.2	1 919.3	1 855.8	2 004.1	2 156.5	2 241.2	2 432.5
Total regional imports	7 117.2	6 514.5	7 043.6	7 615.5	7 257.8	7 415.1	7 915.5	8 613.6	9 023.5
Imports from Malaysia, Thailand and Viet Nam of selected regional markets ($ millions)									
ASEAN	173.9	142.0	186.3	208.9	201.7	225.6	218.5	255.2	265.2
China	62.7	42.7	40.0	77.9	126.4	144.2	156.1	218.2	243.5
Japan	78.9	71.9	79.4	78.2	78.6	85.6	91.6	115.2	144.4
Other*	222.9	144.9	165.8	216.3	252.0	260.7	215.1	203.0	229.6
Total regional imports	538.4	401.5	471.5	581.3	658.7	716.1	681.3	791.6	882.7
Share of Malaysia, Thailand and Viet Nam in total imports of selected regional markets (%)									
ASEAN	13.6	15.4	17.6	18.5	17.6	17.2	15.4	17.1	15.7
China	22.2	15.2	13.2	18.2	29.9	33.6	28.8	32.1	32.0
Japan	2.1	1.9	1.9	1.9	2.1	2.4	2.4	2.7	3.5
Other*	12.8	9.5	10.8	11.3	13.6	13.0	10.0	9.1	9.4
Total regional imports	7.6	6.2	6.7	7.6	9.1	9.7	8.6	9.2	9.8

Source: COMTRADE.

* Hong Kong (China), Republic of Korea and Taiwan Province of China.

Note: The figures presented in this table are based on *import* data reported by the importing countries, whereas those presented in table 2 are based on *export* data reported by the exporting countries. Figures shown for the period 1997-1999 exclude Taiwan Province of China, owing to lack of import data for that economy in COMTRADE.

In the period 1997–2005, Malaysia's share in total regional imports from the world fell slightly, whereas Thailand's share increased to a similar extent as imports from all developing countries. The share of imports into the regional markets supplied by Viet Nam increased very rapidly, although from a low base (tables A.7 and A.8).

EU market for FFV

The EU represents an important market for FFV exports from around the world. The principal developing-country suppliers to the EU-27[28] in 2006 are listed in table A.3 (statistical annex).

[28] EU-27 includes EU-15 (i.e. Austria, Belgium, Denmark, Finland, Germany, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, the United Kingdom) plus Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia (since 1 May 2004), and Romania and Bulgaria (since 1 January 2007).

The value of extra-EU imports of FFV into the EU-15 was $20.2 billion in 2005,[29] of which $14.5 billion (72 per cent) originated in developing countries (table 5). However, ASEAN's share in extra-EU imports has been only around 1.5 per cent in recent years. The value of EU-15 imports of FFV from Malaysia, Thailand and Viet Nam was only $234 million in 2005, of which nuts (imported largely from Viet Nam) represented $105 million.

Malaysia's share in extra-EU imports of FFV has been very small, and has been falling, from around 0.2 per cent in 1997 to only about 0.1 per cent in 2005. Over the same period, Thailand's share (excluding manioc) increased slightly, from around 0.4 to 0.5 per cent. The share of Viet Nam increased the most rapidly, from 0.1 per cent in 1997 to 0.6 per cent in 2005. This represents trade in a very small number of products. For example, over 90 per cent of EU-15 imports from Malaysia (in value terms) consist of "other fresh fruit" (HS code 081090), which include starfruit (carambola), or "fresh passion fruit, carambola and pitahaya" in the more detailed (8-digit) EU import statistics.[30] Although the EU imports a larger range of products from Thailand, only two 6-digit HS items (i.e. "other vegetables" - HS code 070990) – sweet corn and durians[31] – represent around two thirds of the value of total EU imports of FFV from this country. Around 85 per cent of all EU imports of FFV from Viet Nam consist of nuts.

Table 5. EU-15: Imports of FFV from the world and from selected ASEAN countries, 1997-2005

Imports from	1997	1998	1999	2000	2001	2002	2003	2004	2005
					($ millions)				
World	29 112.2	29 912.0	29 073.0	25 724.3	27 384.2	29 940.6	37 023.9	41 481.9	45 227.6
Intra-EU	17 078.9	17 734.7	16 820.0	14 946.0	15 826.4	17 557.7	21 787.8	23 510.8	25 019.1
Extra-EU	12 033.3	12 177.2	12 253.0	10 778.3	11 557.8	12 382.9	15 236.1	17 971.1	20 208.5
Malaysia	25.3	21.4	16.7	17.0	14.4	13.7	14.7	17.0	18.1
Thailand	46.7	47.3	53.0	53.3	60.3	64.0	73.2	81.6	95.0
Viet Nam	13.4	24.9	17.0	36.0	44.7	50.4	77.1	90.0	120.8
Subtotal*	85.3	93.6	86.7	106.3	119.4	128.1	164.9	188.6	234.0
ASEAN	153.2	153.0	143.4	155.8	161.0	192.1	228.9	244.1	308.9
Developing countries	8 473.4	8 409.4	87 20.3	7 906.9	8287.6	8950.8	11052.9	13 012.1	14 589.5
					Share of Malaysia, Thailand and Viet Nam in extra-EU imports (%)				
Malaysia	0.21	0.18	0.14	0.16	0.12	0.11	0.10	0.09	0.09
Thailand	0.39	0.39	0.43	0.49	0.52	0.52	0.48	0.45	0.47
Viet Nam	0.11	0.20	0.14	0.33	0.39	0.41	0.51	0.50	0.60
Subtotal*	0.71	0.77	0.71	0.98	1.03	1.04	1.09	1.04	1.16
ASEAN	1.27	1.26	1.17	1.45	1.39	1.55	1.50	1.36	1.53

Source: COMTRADE.

* Malaysia, Thailand and Viet Nam.

Statistics on EU imports in volume terms (table A.10) confirm the picture described above. EU-15 imports of FFV from Malaysia fell from 72,000 tons in 2000 to 47,000 tons in 2005, despite an increase in the (still very small) volume of vegetable imports. Over the same period, imports from Thailand increased by 50 per cent to 33,400 tons in 2005. The volume of imports from Viet Nam in 2005 (37,200 tons) was three times that of 2000, with imports of nuts alone increasing from 4,500 tons in 2000 to 24,400 tons in 2005. Data on EU-27 imports indicate that these trends continued in 2006: the volume EU-27 FFV imports from Malaysia was 55 per cent lower than in 2000, whereas it was more than 50 per cent higher from Thailand and three times higher from Viet Nam.

[29] Data on the EU presented here generally refer to the EU-15 unless otherwise stated, as several tables present time-series data covering the period 1997-2005 (i.e. mostly before the 12 new members acceded to the EU).

[30] HS code 08109040.

[31] HS-92 code 0810600.

III. SYNTHESIS OF THE CASE STUDIES

This chapter provides a synthesis of the case studies and related discussions that took place at national/regional seminars organized in South-East Asia under the CTF project. It also draws on some findings from similar activities carried out as part of the same CTF project in South and Central America, East Africa, and from some relevant FAO studies. The editors also offer some complementary analysis.

The FFV sector offers opportunities for economic and social development gains for ASEAN countries, particularly in rural areas. Various governments such as those of Malysia and Viet Nam, have established ambitious objectives for the expansion of FFV production and exports. Such objectives are to be met by raising awareness and through improvements in technology, quality and post-harvest handling, with the government providing the needed institutional support, infrastructure and incentives for private sector initiatives. Governments of several ASEAN countries have recognized the importance of GAP schemes to help primary producers increase productivity based on modern management methods, and to respond to challenges in the areas of food safety, sustainable agricultural production and exports. Consequently many of them, including Malaysia and Thailand, have developed national GAP schemes, mainly through government-driven initiatives.

Although ASEAN countries' exports to Europe are still relatively small, they offer market potential for achieving the objectives of export expansion and diversification into high-value products. For example, Thai FFV exports to the EU, particularly vegetables, have been growing as a share of total Thai FFV exports.

Apart from efforts to promote efficient FFV production, access to external markets is crucial. With regard to Japan and regional developing-country markets, the most important market access concerns of ASEAN countries relate to SPS requirements resulting from government regulations. Private sector standards play a less important role, at least for the time being. Within these government regulations, pesticide regulations are probably the most important. In Japan, for example, amendments to the Food Sanitation Law (implemented since May 2006) imply significant changes in the way residues of plant protection products are regulated. Japan has adopted a "positive list" approach with regard to MRLs for specific pesticides. If a residue exceeds the maximum limit, or if a product contains a residue of a pesticide for which there is no specified MRL, the product cannot be imported into Japan.[32] Therefore, ASEAN countries need to carefully monitor the active substances used in pesticides applied to crops that are exported to Japan as well as the pesticide residue levels. China too has developed pesticide regulations that need to be met for FFV exports to that country.

Pesticide regulations are in place in most ASEAN countries, but are often poorly enforced. One leading priority of GAP schemes is to provide incentives to farmers to effectively comply with food safety legislation and to enhance their capacities to conform with pesticide regulations in external and domestic markets. Most GAP schemes in ASEAN countries therefore emphasize pesticide control and MRL monitoring, although too little attention is paid to microbial and parasitic contamination issues (Sardsud, 2005; Shepherd, 2006). Some GAP schemes currently pay little or no attention to environmental and workers' welfare issues. The Thai Q-GAP, for example, has no specific control points concerning environmental protection and workers' health, safety and welfare (and thus relies on compliance with relevant national legislation). It is expected that national GAP schemes will gradually be expanded to cover these other areas more fully, including product quality. This would bring national schemes closer to GAP standards that are recognized in major import markets, such as EurepGAP. In Malaysia, for instance, the original SALM scheme already had some criteria relating to the environment and workers' health and safety, and the 2005 revision of the scheme has resulted in the inclusion of additional criteria in these areas.

Government institutions in several ASEAN countries (e.g. in Malaysia and Thailand) provide free services, such as training, inspection and certification, to assist farmers in complying with the

[32] With regard to phytosanitary requirements, under Japan's Plant Protection Law, exports of a relatively large number of FFV from Malaysia, Thailand and Viet Nam (among other countries) are banned. Examples include avocados, papayas, mangoes, and various minor tropical fruits such as carambola, rambutan, longans, lychees, passion fruit, guavas, breadfruit, jackfruit and cherimoya (Pay, 2005: 34, table 11). However, some of these products may still be allowed under certain conditions. For example, specific import conditions have been agreed upon for mangoes from Thailand.

requirements of the national GAP schemes and to obtain certification against the national GAP standard. In Viet Nam, however, it is largely donors and the private sector, in particular through producer organizations, that have driven current GAP initiatives (including efforts to facilitate EurepGAP certification).

Whereas strong government support is one of the strengths of GAP schemes in most ASEAN countries, the involvement of governments also raises some issues that need to be addressed, such as unrealistic objectives or overambitious implementation of the GAP schemes, distribution of responsibilities between government agencies, the private sector and academic institutions, insufficient stakeholder involvement in the development and implementation of the schemes, and lack of coherence in accreditation and certification. In Malaysia and Thailand, the departments of agriculture serve as both judge and jury for the implementation of the national GAP scheme. Moreover, GAP certification often lacks credibility. In Thailand, for example, policy directives require the Department of Agriculture to certify a large number of fruit and vegetable farms. However, it is suggested that the Department is doing this without complying with internationally recognized certification practices, and that there has been no effort to promote private sector participation in certification (Wipplinger, Phongsathorn and Watanakeeree, 2006). In Malaysia, the Department of Agriculture audits and certifies farms, but there is a perception that "soft auditing" has been conducted (at least for the first certification audit) in order to encourage small farmers to subscribe to the scheme. Furthermore, the roles of farm inspectors and auditors are not clearly defined, resulting in an overlapping of functions.

Steps are being taken to address these problems. In Malaysia, for example, the Department of Agriculture is pursuing an agreement with SIRIM-QAS, the National Standards body, to enable the outsourcing of third-party auditing and certification services. This will reduce the burden on the Department and will also improve the credibility of SALM.

There is little international recognition for the national GAP schemes in ASEAN countries. Exporters, in particular those to markets outside the region, such as the EU, are more interested in certification against the EurepGAP standard or other schemes that enjoy widespread buyer recognition. However as a recent study argues, certifying only export production will not provide the critical mass needed to create a market for certification against the EurepGAP or other standards that enjoy international buyer recognition. But this might be changing. The modern retail sector in Thailand, for example, may demand higher level third-party certification for the domestic market as well (Wipplinger, Phongsathorn and Watanakeeree, 2006).

The case studies presented here and work carried out by institutions such as the FAO emphasize that the development of national (or regional) GAP schemes requires a clear understanding of their objectives, strategies and each county's potential. National GAP schemes should, for example, adequately balance the requirements of domestic and export markets based on a realistic evaluation of the capacities available in each country (Poisot, 2007). Also, national GAP schemes need not follow a single-focused approach aimed at facilitating the certification that may be required to be able to sell to retailers in international markets, but also at promoting national, regional and international wholesale markets, national wet markets (i.e. traditional, open air food markets) and organic agriculture.

Objectives and benefits of GAP

Implementation of GAP schemes can bring a number of benefits, in particular enhanced consumer health, improved workers' health and safety and reduced environmental impacts through more appropriate use of pesticides. It can also bring economic gains as a result of more efficient use of resources (e.g. appropriate minimum application of crop protection products) and improved post-harvest handling. In addition, national GAP schemes can provide incentives to farmers to effectively implement mandatory food safety requirements that are otherwise often poorly enforced. Such schemes could eventually facilitate access to export markets. In general, however, national GAP schemes in South-East Asia are not yet well recognized in international markets, including regional markets. Therefore, certification against such national schemes may currently contribute little to facilitating market access. However, Malaysia has a bilateral agreement with Singapore (its principal market for FFV exports), which facilitates exports from farms that are certified against Malaysia's national GAP

scheme. In Thailand, the Department of Agriculture's GAP certification facilitates the securing of export permits,[33] while Malaysia is taking steps towards benchmarking SALM to EurepGAP.

Obstacles to GAP implementation

The country case studies summarized in this publication, as well as those undertaken as part of FAO projects, have identified a range of obstacles specific to GAP implementation, including the following:

- Low levels of awareness about safety, environmental and social impacts of agricultural practices, and of potential benefits of GAP implementation;
- Low levels of education, poor record keeping and resistance to change;
- Poor understanding of GAP requirements;
- Lack of direct links with markets;
- Lack of incentives to implement GAP, as it does not normally result in price premiums;
- Unhygienic practices in production and post-harvest activities;
- The small number of large producer-exporters who comply with EurepGAP standards and can play a key role in the effective implementation of national GAP programmes (e.g. through their networking with growers);
- Problems of land ownership and tenure, and the widespread use of short-term rental contracts for land, for example in Thailand, which discourage farmers from making the investments required by GAP schemes, as benefits accrue to landowners (Shepherd, 2006); and
- There is a general unwillingness of supermarket chains to become involved in providing bridging finance to farmers, a role played by traders in traditional marketing systems. This poses severe problems for the cash flow situation and investment and innovation capacity of small producers (Chen, Shepherd and da Silva, 2005).

The domestic market for GAP-certified products

In ASEAN countries in general, there is still low consumer awareness of and concern for safety and quality of FFV, and little knowledge of GAP schemes. For the vast majority of consumers, price is the main concern. Consequently, GAP-certified products usually do not fetch a price premium. Marketing channels also play a role. The majority of traditional middlemen who buy FFV from farmers are not equipped to distinguish more than one grade and to provide appropriate guidance on quality improvement (Shepherd, 2006). Thus, although traders may well refuse to purchase produce that does not meet minimum standards, there is no price incentive for farmers to produce quality goods above those standards. Farmers who wish to apply new techniques and practices to improve quality may have to develop entirely new marketing channels (Shepherd, 2006). Quality marks, such as Thailand's "Q mark" and brands such as "Malaysia's Best" may play a role in promoting awareness of food safety issues and GAP in the domestic market and help to expand domestic markets for GAP-certified produce.

The Malaysian case study suggests that SALM-registered farmers may get priority in the local market and qualify as preferred suppliers to local supermarket chains (Chapter IV). It has also been argued, however, that international retailer chains, such as Tesco, may be more interested in sourcing products certified against EurepGAP or similar standards. Tesco-Lotus, a supermarket chain in Thailand and China, is starting a quality assurance programme for Thai producers, which is a simplified EurepGAP system based on EurepGAP criteria and control points. The company intends to bring all its national suppliers up to the EurepGAP standard within five years. The TOPS supermarket in Thailand started a supply chain programme in 1998 which is linked with the Q-GAP system of the Department of Agriculture. It includes contract farming with selected wholesalers and the establishment of new village-level associations that group smallholder suppliers.

A factor that also plays some role in the recent launching of individual GAP schemes by large retailers is the emerging overcapacity of sales space in major urban agglomerations, such as Bangkok and Chiang Mai in Thailand. Retailers are seeking to offer distinctly fresh produce in an increasingly

[33] For example, whereas *all* FFV destined for export require pesticide residue analysis, this may be reduced to 10 per cent random sampling if the FFV comes from a Q-GAP-certified farm.

competitive market. The recently launched project of the Thai Fruit and Vegetables Producers' Association and Kasetsart University in Thailand to establish a ThaiGAP benchmarked to EurepGAP is an attempt to counter the trend towards individual retailers developing their own separate GAPs and thus avoid multiple certification requirements (box 3). The case of Thailand illustrates that a modular approach to GAP schemes is emerging at the national level, which calls for a coherent shaping of the modules aimed at: (i) assuring the integrity of the whole system; (ii) allowing graduation from a simpler module to a more advanced module; and (iii) creating interfaces between the modules. All this should serve to avoid confusion among producers and consumers, ease access to domestic and foreign markets and reduce or optimize certification costs (for more details, see below).

The growth of supermarkets in ASEAN countries, such as Malaysia and Thailand, is creating greater demand for higher quality FFV. However, consumers tend to continue to buy FFV from traditional retailers even though they may use supermarkets for other products. According to the Malaysian case study (chapter IV), 75 per cent of the FFV produced locally end up for sale in the traditional markets, such as wet markets and local grocery stores. The traditional markets are still very active because they offer a "personal touch", are more centrally situated, making them more convenient for "small" shoppers, and are perceived to provide better value.

Factors that need to be considered in national GAP schemes

National GAP schemes and related extension services should take into account the conditions and needs of small producers, in particular, in meeting GAP requirements. For example, a considerable obstacle to GAP implementation is the low level of awareness and education of smallholders, as mentioned earlier. These constraints need to be addressed through training and a range of other measures (as discussed in the section on recommendations).

One major problem to be addressed in national GAP schemes is the often excessive use of chemicals and the absence of a system for tracking agrochemical use. In Viet Nam, for example, improper application of chemicals has resulted in many documented cases of food poisoning, even resulting in deaths. Other issues to be addressed are the need to introduce a value chain approach ("from farm to table"), the need for an adequate accreditation and certification infrastructure, and human resources development at all levels, including growers, government officials, auditors and other stakeholders.

There should be a careful balancing of criteria in the light of the requirements of domestic and foreign markets, taking into account the particular circumstances of and capacities available in each country. A realistic assessment of these needs should assist in identifying appropriate strategies. GAP schemes and relevant extension services should also aim at assisting producers, particularly smallholders, in supplying safe and healthy products to national, regional and international wholesale markets, local wet markets (most of which take place in open-air market places or streets, where local farmers supply produce direct from the field to the end consumer) and to markets dealing in products from organic agriculture.

Gradual approaches to the development and implementation of local GAP schemes

The case studies propose a gradual and multi-tier approach to the development and implementation of local GAP standards, focusing first on the requirements of local and regional markets. From an export perspective, such an approach is possible and appropriate, particularly for ASEAN countries because the geographical pattern of their FFV exports has a strong focus on regional markets and thus allows time to adjust to the more stringent private sector requirements of extra-regional markets such as the EU. Technically, a gradual approach can be implemented through the use of "major must", "minor must" and "recommended" criteria, different certification levels (as in the Thai Department of Agriculture's GAP and IndonGAP), the creation of different modules (as in ASEAN-GAP described in box 1),[34] or through revisions of national standards (as in SALM).

[34] Freshcare, a private-sector standard in Australia also follows this approach (discussed in the overview of private-sector standards presented in the introduction).

It is reasonable to assume that in many cases there will be a coexistence or multi-tier (modular) system of GAP schemes at country level that can flexibly, and in accordance with national capacity, appropriately respond to the environmental, health and food safety requirements of export markets (in Asia and in Europe) and the national market. The national or government-supported GAP programme should provide the basic, general GAP reference point, which can thereafter be scaled up beyond requirements for only safe agrochemical use over time. Other GAP schemes, either at regional or company level, would form premium GAPs that strive to approach or be equivalent to EurepGAP. Direct EurepGAP certification of individual large producers is always an option. To avoid confusion (notably among producers, consumers and traders at the national level) all these multi-tier systems should be linked/interfaced in an appropriate way, using the national GAP programme as the benchmark.

Table 6. Number of EurepGAP-certified producers (options 1 and 2), April 2007

	Number of certified producers				Structure (%)		
	Total	Option 1	Option 2	PMOs*	Total	Option 1	Option 2
World	68 006	21 766	46 240	948	100	32.0	68.0
Developing countries	12 799	4 954	7 845	216	100	38.7	61.3
Developing Asia	5 381	660	4 721	82	100	12.3	87.7
ASEAN	752	30	722	11	100	4.0	96.0
Thailand	726	25	701	7	100	3.4	96.6
Malaysia	13	3	10	3	100	23.1	76.9
Viet Nam	11	0	11	1	100	0.0	100.0
Other Asia	4 596	597	3 999	71	100	13.0	87.0
Turkey	3 295	103	3 192	39	100	3.1	96.9
India	1 027	411	616	13	100	40.0	60.0
China	266	75	191	19	100	28.2	71.8
Latin America, Caribbean	4 547	2 421	2 126	74	100	53.2	46.8
South and Central America	4 300	2 267	2 033	71	100	52.7	47.3
Argentina	1 075	359	716	32	100	33.4	66.6
Chile	1 165	956	209	4	100	82.1	17.9
Brazil	549	258	291	8	100	47.0	53.0
Peru	489	190	299	8	100	38.9	61.1
Colombia	382	104	278	5	100	27.2	72.8
Costa Rica	272	127	145	10	100	46.7	53.3
Ecuador	214	214	0	0	100	100.0	0.0
Mexico, Caribbean	247	154	93	3	100	62.3	37.7
Africa	2 871	1873	998	60	100	65.2	34.8
Sub-Saharan Africa	2 254	1527	727	33	100	67.7	32.3
South Africa	1 538	1442	96	2	100	93.8	6.2
Kenya	606	31	575	27	100	5.1	94.9
North Africa	617	346	271	27	100	56.1	43.9
Morocco	353	210	143	13	100	59.5	40.5
Egypt	248	120	128	14	100	48.4	51.6
All other countries	55 207	16 812	38 395	732	100	30.5	69.5
European Union	31 333	9 455	21 878	655	100	30.2	69.8
Italy	13 180	1 224	11 956	199	100	9.3	90.7
Greece	12 136	423	11 713	168	100	3.5	96.5
Spain	7 173	988	6185	217	100	13.8	86.2
Germany	6 511	6 348	163	8	100	97.5	2.5
Netherlands	4 592	4 535	57	2	100	98.8	1.2
Australia, New Zealand	2 010	334	1676	12	100	16.6	83.4

Source: FoodPlus, personal communication.
* Produce marketing organization.

Options for achieving EurepGAP certification

Producers have four options for EurepGAP certification: individual certification against EurepGAP (option 1), group certification against EurepGAP (option 2), individual certification against a benchmarked scheme (option 3) and group certification against a benchmarked scheme (option 4). By April 2007, a total of 68,006 producers had been certified worldwide under options 1 or 2 (table 6). This does not include producers certified under EurepGAP-benchmarked local standards (options 3 and 4). Of this total, 21,766 producers (32 per cent) had obtained certification individually (option 1). In addition, 948 produce marketing organizations (PMOs), with an estimated 46,240 producers (68 per cent), had obtained group certification. Countries with the largest number of producers that had obtained certification through option 1 were Germany, the Netherlands and South Africa. Most producers with certification through the group certification option were to be found in Southern Europe (Greece, Italy and Spain). With regard to developing countries, Turkey had about 40 per cent of producers that had opted for group certification.

Few growers in the three countries analysed in this study had obtained EurepGAP certification: 726 in Thailand, 13 in Malaysia and 11 in Viet Nam.[35] Of the 726 EurepGAP-certified producers in Thailand, 25 had obtained their EurepGAP certification under option 1 and 701 under option 2. The latter belong to 7 producer groups, some of which have a few hundred members. In Malaysia, only 3 producers had obtained EurepGAP certification under option 1, and another 10 had been certified under option 2.[36] In Viet Nam, 11 producers, all belonging to the same PMO, had obtained option 2 certification. Although the number of certified producers is still too small to permit drawing any conclusions, so far the number of producers having obtained EurepGAP certification through the group certification option (option 2) is larger in developing Asia than in any other major region.

Group certification may be an option for small-scale producers. The group must implement a quality management system with an internal control mechanism. Third-party inspection of the group is then limited only to the square root of the total number of members (e.g. 5 for 25 members, 10 for 100 members, and so on). Implementing a quality management system for the group, however, is not an easy task. Group certification may be a viable option for those small-scale producers who are either part of legally established producer groups or suppliers of large exporters who support them in implementing the internal control mechanism.

Benchmarking of national GAP schemes to EurepGAP may contribute to gaining wider acceptance of those schemes in international markets, including in markets with high potential for future growth like the EU market, while maintaining the benefits of a scheme that takes local circumstances into account. In Malaysia, the revision of SALM, based on a new and comprehensive Malaysian GAP standard (MS GAP 1784:2005) and the EurepGAP protocol, has created a basis for the benchmarking process launched in September 2007. In Thailand, the ThaiGAP project, proposed, among others, by the Thai Chamber of Commerce and the Thai Fruit and Vegetable Producers Association (see box 3), may also be able to develop a standard that responds to domestic needs, and could in the future be benchmarked to EurepGAP. It is envisaged that ThaiGAP will assist small-scale Thai producers in achieving group certification against the benchmarked standard (option 4).

The creation of national interpretation guidelines may also be useful to help make EurepGAP certification more cost-effective and accessible to fruit and vegetable growers in ASEAN countries. National interpretation guidelines add another (third) column to the EurepGAP standard that spells out the national interpretation of compliance criteria for the EurepGAP control points/compliance criteria (CP/CC). Another option, which is being implemented by Germany's GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) project for small and medium-sized enterprises (SMEs) in Viet Nam, is to set up a local certification body with international assistance through accreditation by DAP (the

[35] These figures correspond to the number of producers with EurepGAP certification at a particular point in time (in this case April 2007), according to information available in the EurepGAP database, which in turn is based on information provided by certification bodies. These figures may sometimes be subject to short-term fluctuations. For example, a recent EurepGAP press release presented a much lower number of certified producers (233) in Thailand in August 2007 (EurepGAP press release, 7 August 2007).

[36] Based on information provided by FoodPlus, it is estimated that at the time of updating this chapter (July 2007), 16 farms in Malaysia were EurepGAP-certified. These were mainly star fruit growers who export to Europe.

German Accreditation System for Testing), an accreditation body that is a member of the International Accreditation Forum.

Certification against EurepGAP may be costly. Even though some international certification bodies have branches in Malaysia, Thailand and/or Viet Nam which are duly accredited to certify producers/exporters against the EurepGAP Standard for Fruit and Vegetables, the demand for internationally recognized certification services in ASEAN countries is still very small, and there is often a need to seek auditors from abroad, at a high cost. The supermarket sector may increasingly demand higher level third-party certification for the domestic market.

Role of governments in GAP development and implementation

As mentioned above, the development of national (and regional) GAP initiatives in ASEAN countries has been driven largely by governments. Whereas government commitment and support constitutes one of the strengths of GAP schemes in ASEAN countries, there remain some key issues that need to be addressed. These concern: (a) the distribution of responsibilities between government agencies, the private sector and academic institutions; and (b) the need for coordination between government agencies, and appropriate stakeholder involvement in the development and implementation of GAP schemes.

With regard to responsibilities, some have argued that the government is the best placed to assure certain services, such as metrology, accreditation and coordination of policy dialogue. Other services, such as advisory services, farm inspection and certification can also be provided by the private sector. And there are suggestions that governments in ASEAN countries should indeed outsource the provision of these other services to the private sector.

Concerning coordination, top-down, government-driven development of national GAP schemes carries the risk that producers, exporters and research institutes will be insufficiently involved in the development of such schemes. The latter may result in duplication of efforts and the development of standards that may be largely ignored by exporters and customers in target markets.

Appropriate stakeholder involvement is also important in the context of regional initiatives. Robert and Menon (2006) argue in the Malaysian country case study that while the ASEAN secretariat's initiative to develop an ASEAN-wide quality assurance standard is a step in the right direction (see box 1), a weakness is that the development of the framework and standard did not include all stakeholders, particularly the producers and exporters. Participants in the development of the standard were largely from the governments or government-linked organizations.

The case study on Viet Nam notes that in the development of national GAP schemes, the Government has adopted a public-private participatory approach rather than a traditional top-down approach, with an increasingly important role played by associations of producers, including farmers' organizations. However, that study calls for stronger Government commitment to and support for GAP development and implementation.

In light of the above, key responsibilities of governments should be:

- Promoting and facilitating the design and implementation of national GAP standards in a way that meets domestic and international buyers' requirements;
- Promoting dialogue with stakeholders, and clarifying the role and responsibilities of government agencies as well as private sector entities (laboratories, third-party certification bodies, consultants, training and research institutes, food producer associations); and
- Formulating and implementing policies relating to food safety and quality.

Other responsibilities of government should include:

- Ensuring that auditing standards are observed;
- Elaborating criteria and parameters to be considered when assessing new sites for FFV production;

Box 3. ThaiGAP

Collaborative efforts are under way by government institutions and the private sector to develop ThaiGAP, a quality scheme for agricultural production in Thailand covering fruit and vegetables, livestock and fisheries, that is equivalent to stringent GAP standards in international markets. ThaiGAP should help to develop the capacity of smallgrowers to meet local retail requirements as well as standards and regulations in international markets. It is envisaged that ThaiGAP will eventually be benchmarked to EurepGAP.

In the second half of 2007, the Committee of the Thai Agriculture and Food Product Association of the Thai Chamber of Commerce launched a two-year project to develop ThaiGAP. Partners include the Office of Commodity and System Standards Accreditation (CSSA), the Department of Agriculture, the Department of Agricultural Extension, the Thai Chamber of Commerce as well as chambers of commerce in key provinces, the Western Cluster GAP/Kasetsart University, the Thai Fruit and Vegetable Producers Association, and groups of small-scale growers and SMEs. The Department of Fisheries and the Department of Livestock Development will participate in a second stage of the project.

For the development of ThaiGAP, specific responsibilities have been assigned to different partners. For example, Kasetsart University will be responsible for exploring how the regulations of the Western Cluster GAP can be used as a guideline for developing regulations for the ThaiGAP. It is also responsible for developing and supporting other clusters (of which eight more are planned in addition to the Western Cluster) to facilitate compliance with the requirements of EurepGAP and ThaiGAP. The Thai Chamber of Commerce, Board of Trade of Thailand, in cooperation with the Office of Small and Medium Enterprises Promotion, Kasetsart University and GTZ will cooperate to help develop the competence and efficiency of smallgrowers to enable them to compete in world markets.

ThaiGAP will facilitate smallholder certification through group certification against the benchmarked standard (option 4). Certification will be the responsibility of independent and duly registered certification bodies. ThaiGAP will focus on the major markets, in particular China, Japan, Australia and the EU.

It is expected that ThaiGAP will, in particular:

- Build confidence in the quality and safety of Thai products in the domestic and external markets (also supporting the Government's "kitchen for the world project");
- Create and support clusters of smallgrowers and SMEs. Help smallgrowers stay in business and increase their welfare, including incomes;
- Establish a national quality standard for agricultural produce equivalent to the high standards and SPS requirements of world markets;
- Create a traceability system;
- Develop awareness about food safety throughout the country. Reduce the costs of production adjustments that are required in order to participate in value chains and compete in world markets;
- Reduce the cost of quality and safety testing of agricultural products as a result of improved agricultural production; and
- Assure the safety and sustainability of agricultural production in Thailand.

- Effectively monitoring companies that supply services and inputs relevant to GAP, such as providers of calibration products and services, laboratories and suppliers of fertilizers and agrochemicals;
- Assuring effective control of some elements that are referred to in control points of national GAP schemes and, where relevant, of EurepGAP, and promoting the creation of conditions for compliance (e.g. facilities for the disposal of empty packages of agrochemicals);
- Developing and updating a national registry of crop protection products, and closely monitoring related MRL levels in key export markets; and
- Launching initiatives or creating institutions that promote farmer-retailer linkages and improve produce distribution channels. This may also include measures that address the temporary financial gaps of small farmers in new supply chains.

Extension services and training

The case studies stress the essential role of extension services and training in GAP implementation. With regard to the latter, farmers need to be trained in aspects such as pesticide management, traceability and record keeping, farm business management skills, sound environmental and social practices, basic food hygiene and sanitation, post-harvest management and certification procedures. Capacity-building efforts are also required at the macro level. For extension agents this should include teaching them basic GAP principles, IPM and integrated crop management, food regulation and market requirements for exports, packaging and post-harvest technologies. For other agents capacity-building should cover laboratory practices, sampling, traceability procedures, GAP auditing and market information systems (Santacoloma, 2007).

In Malaysia and Thailand interesting initiatives have been taken to promote the marketability of produce from certified farms. In Malaysia, FAMA helps to identify local and export markets and provides the Malaysia Best logo for produce that conforms to specified criteria. FAMA has launched the contract farm concept which encourages selected large farms to achieve SALM certification and encourages buyers to source produce from SALM-certified farms. Thailand applies the "Q" quality mark for certified farms. The Q-GAP (for farms) is part of a supply chain scheme and is supported by other "Q" certifications.

Putting GAP into context[37]

Issues related to GAP development and implementation should not be considered in isolation from the policy clusters that address closely related factors, in particular: (i) investment in strengthening traditional markets; (ii) control of supermarket power; and (iii) support to producer organizations.

The rapid expansion of retailers, including in national markets of developing countries, has led national governments and the international donor community to view GAP as the major development trend of modern agriculture in developing countries. This runs the risk of diverting scarce resources away from the development and upgrading of conventional wholesale and wet markets, which continue to serve the majority of consumers in developing countries.

Humphrey (2006b) goes a step further and contends that given the formidable challenges facing small producers with regard to adjustment costs to new private food standards, it is worth considering whether a focus on small farmers' exports to large buyers in the most challenging of global markets should not be complemented, or even replaced, by alternative strategies. He suggests that such strategies could aim at: (i) improving the efficiency and diversity of traditional national and regional markets; (ii) exploring the potential of niche markets, including for organic agriculture; (iii) targeting less demanding export markets; and (iv) improving conditions for wage labour on large commercial farms. In this context, Humphrey stresses that if the overall policy goal of agricultural development policy is poverty reduction, a strategy of allowing small farms to decline and focusing instead on improving conditions for wage labour might be equally effective.

A range of regulatory instruments has been used in different countries at different stages that help to delay or shape the restructuring process of supermarkets, thereby allowing breathing space for small producers to prepare for change. These might relate to investment policy, competition law, limits on store size, location or business hours, or minimum local content requirements.[38] New zoning regulations drafted by the Town and Country Planning Department in Thailand, which came into effect in August 2003, curb the expansion of large supermarkets by imposing zoning ordinances in provinces outside Bangkok. Large retail stores (with at least 1000m^2 of retail space) have to be located at least 15 km from the commercial centres of provincial towns. The Malaysian Government has been limiting the expansion of supermarkets in major cities such as Kuala Lumpur, Johor Bahru and Penang and in towns with less than 350,000 people, in part to help regional players. The Internal Trade Department in Thailand is in the process of setting fair trade guidelines to restrict retailers' use of bargaining power with suppliers for securing large price reductions, and to protect small and medium-sized businesses.

[37] This section draws mainly on Vorley, Fearne and Ray, 2007, chapter 18.
[38] For a more elaborate overview, see Reardon and Hopkins, 2006.

Organizations of small producers need governmental and donor support in areas of credit provision, creation of cooperatives, standards setting and implementation. However, none of this works without prior or parallel investment in infrastructure such as roads, post-harvest facilities and grading systems.

Finally, standards can play a role as chain management tools in global supply chains. Global supply chains are increasingly replacing spot market deals and thus are reshaping the organization of production and trade relations, including in the agri-food business. In global supply chains, one or a small number of lead firms exercise control over suppliers with which there are no ownership relations (in captive value chains), through the use of three kinds of "governance" tools: (i) standards; (ii) brand names; and (iii) intellectual property rights (IPRs). These governance tools aim at achieving monopolistic market power, protecting innovation rents and appropriating an increasing share of overall gains in value chains. They can be used individually or in combination, depending on the sector: for food products, for instance, mostly standards are used, in the clothing and apparel industry brand names are the main instrument, whereas in the electronics industry all three kinds of tools are being applied.[39]

The "captive" supply chain is a double-edged sword for developing-country producers. On the one hand, it offers ample opportunities for process and product upgrading and related productivity and efficiency gains, and for the generation of employment and related social benefits. It also enables developing-country firms to export to markets that are otherwise difficult for them to penetrate. On the other hand, functional upgrading of supply capacity, (e.g. moving from original equipment manufacture to own-design and own-brand manufacture), is often blocked, creating a continued dependence on a small number of powerful customers.[40]

Recommendations

A number of recommendations emerge from the country case studies and from further discussions in the regional workshops carried out as part of the CFT project. This section presents a synthesis of the detailed recommendations made in each country study. It also draws on the results of similar case studies conducted in South-East Asia as part of projects implemented by the FAO, as well as lessons learned from experiences of countries in South and Central America and East Africa that are relevant beyond the purely regional context.

Development and implementation of national GAP schemes

Recommendations include the following:

- *Institutional framework:* Effective and credible GAP implementation requires a well-structured institutional framework and clearly defined roles of the government and the private sector. The various institutions involved in the planning, management and implementation of a national GAP scheme must have a clear understanding of the concepts and priorities of the scheme and show strong commitment to its objectives;
- *Outreach:* The objectives, concepts and potential benefits of GAP schemes need to be well explained to growers to facilitate effective implementation;
- *Stakeholder involvement:* The successful design and implementation of GAP schemes requires effective stakeholder involvement;
- *Gradual approach to GAP implementation:* ASEAN countries should continue to gradually upgrade their national GAP schemes, taking into account domestic needs as well as international buyers' requirements. A top priority of GAP implementation in ASEAN countries should be to help prepare farmers to meet food safety requirements (in particular pesticide use and

[39] A recent submission of China to the WTO Committee on Technical Barriers to Trade (TBT) provides an example of the link between standards and IPRs. It concerns the computer company Dell, which was a member of the Video Electronics Standards Association (VESA) that set a design standard for a computer bus in response to the demand for higher graphics performance. All VESA members adopted the new VL-bus standard in 1992. Eight months after the standard was adopted, and following its widespread use in over 1.4 million computers, Dell claimed that implementing the VL-bus standard had to be based on Dell's patent rights (WTO, 2006).

[40] Studies from India and Brazil, in particular, have shown that firms specializing in producing for the national market are more likely to develop their own designs, brands and marketing channels (for more information, see Schmitz, 2006).

MRLs), and to provide them with incentives to comply with national food safety regulations. Emphasis on the appropriate registration and use of plant protection products also helps in protecting the occupational health and safety of rural workers. GAP schemes can gradually include other objectives, including environmental management and workers' welfare issues. A two-tier approach could promote a scheme consisting of a "basic" standard for local requirements and an "export" standard to meet the requirements of private sector standards in premium markets such as the EU. Farmers could then satisfy the immediate requirements of the domestic market while moving gradually towards meeting the more demanding "export" standards. As the case of Thailand illustrates, modular approaches to GAP schemes are emerging. In Thailand's case, this consists of a national, government-run GAP scheme, directly EurepGAP-certified companies, regional GAP schemes benchmarked to EurepGAP, and a ThaiGAP scheme, currently under development, which is planned eventually to be benchmarked to EurepGAP. Such an approach calls for a coherent design of the modules aimed at: (i) assuring the integrity of the whole system, (ii) allowing graduation from simpler to more advanced modules, and (iii) the creation of interfaces between the modules. All this should serve to avoid confusion among producers and consumers, ease access to domestic and foreign markets and reduce or optimize certification costs; and

- *Contamination:* National GAP schemes should not only address chemical, but also biological and physical contamination of the produce and the environment.

Facilitating GAP certification

Recommendations include the following:

- *Making GAP implementation easier for small-scale producers:* In Malaysia, small-scale farmers are assisted with specific, pre-formatted checklists to manage record keeping on the farm;
- *Training:* Training activities are an essential requisite for successful GAP implementation, in particular by smallholders. There is a need to improve coordination between government institutions, universities and other providers of training. Training should also be provided to government officials, auditors, certification bodies and other relevant stakeholders;
- *Testing:* ASEAN countries need to enhance their national and/or regional capacity for testing (for example on pesticides residues and water quality) in accordance with international standards;
- *Cooperation among growers:* Such cooperation should be promoted, for example through the creation of producers' groups. These groups would monitor the farming practices and product quality of their members. Strong growers' groups that can effectively implement GAP could increase their bargaining power vis-à-vis manufacturers and exporters for increasing the farm-gate prices of their products. In Malaysia, FAMA and the Farmers' Organization Authority (FOA) are encouraging the creation of farmer group associations; and
- *Public-private partnerships:* Due to the high costs of implementing GAP, there is a need to promote partnerships between the public and private sectors. Promoting links between EU buyers and producers/exporters in ASEAN countries may help to promote compliance with the EurepGAP standard throughout the supply chain.

Marketing of produce that complies with GAP standards

- One recommendation is to *promote marketing of certified produce*. The experience of Malaysia illustrates the importance of promoting the marketability of produce from certified farms, and provides examples of how this can be done.

Certification issues

Recommendations include the following:

- *Credible accreditation and certification:* This is required to enhance acceptance of certification against national GAP standards in domestic and international markets. For example, credibility of national standards requires consistency of outcomes of conformity assessments,

and competent auditors who should safeguard their independence by not providing either advisory or extension services;

- *Certification services:* There is a need to expand the domestic and regional markets for produce that has been certified against standards that are recognized in external markets. The training of national experts in certification and internal control should also be promoted and international certification bodies should be encouraged to employ national inspectors and other experts. The public sector could provide financial assistance to small producers to help cover the costs of GAP certification services. However, it should do so without competing on an unfair basis, such as only subsidizing the costs of certification services provided by the government or legally requiring the use only of services provided by government entities; and
- *Acceptance of national GAP standards in international markets:* Efforts should be made to ensure that a credible and successful national GAP programme gains international acceptance, including by exploring future benchmarking of national standards. The development of national interpretation guidelines may assist in making EurepGAP control points and compliance criteria understandable in the national context, and may make future benchmarking easier by taking the requirements of national standards into account, as far as possible.

International issues

A number of recommendations that emerged from case studies in South and Central America, Central and Eastern Africa, and joint UNCTAD/FAO meetings may be worth considering as they might become more relevant as growers/exporters in South-East Asian developing countries move towards seeking EurepGAP certification:

- *Making private voluntary standards more accessible to smallholders:* Efforts should be made to ensure that: (a) requirements are not discriminatory and disproportionate to the risks involved; (b) compliance criteria are appropriate to the developing-country context; and (c) auditors facilitate a proper interpretation of control points and compliance criteria (i.e. in the case of laboratory samples and analysis) (Santacoloma, 2007). With regard to the latter point, the development of national interpretation guidelines may be useful;
- *Facilitating effective and affordable developing-country participation in the development of private sector standards:* Developing countries may find it difficult to effectively participate in the development and revisions of private sector standards, partly because of the costs of membership fees and of participating in meetings in different parts of the world, for example. Frequent revisions of standards, such as the EurepGAP standards, may further complicate developing-country participation. EurepGAP National Technical Working Groups (NTWGs) for fruit and vegetables could channel inputs from national experts to EurepGAP technical standards committees and draw attention to problems resulting from short cycles of revisions to EurepGAP protocols. Donors may wish to support participation of developing-country representatives in annual EurepGAP meetings and in the work of its technical committees; and
- *Encouraging more dialogue between the different stakeholders:* There is a need for more dialogue between representatives of private sector standard-setting organizations, governments and producers/exporters in developing countries, and for the exchange of successful national experiences, in particular among developing countries. Such a dialogue could focus on: (a) conceptual issues and appropriate approaches to the development of national GAPs; and (b) clarification of the role of governments and other stakeholders. Donors could play an important role in facilitating consultations in this regard. UNCTAD's CTF has already been supporting national and subregional stakeholder dialogue, and it plans to intensify these activities in the future, in close cooperation with the FAO and FoodPlus GmbH (the EurepGAP secretariat), as appropriate.

IV. NATIONAL EXPERIENCES WITH GAP STANDARDS: MALAYSIA

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Introduction

Agriculture makes a significant contribution to Malaysia's national economy and thus plays a vital role in the country's development. Plantation crops, in particular oil palm and rubber, occupy the major proportion of the agricultural land. Horticulture, including fruit and vegetables, occupies a much smaller area.

Malaysia is a net importer of food products (SITC 0, food and live animals),[41] including fruit and vegetables. In 1997 (the year of the East Asian financial crisis), the deficit in food trade reached $1.9 billion, of which around one quarter constituted trade in FFV. Therefore, one of the primary policy objectives of the Malaysian Government in recent years has been to promote enhanced and more efficient agricultural production with a view to reducing imports and increasing exports. Under the Third National Agricultural Policy (NAP3) for 1998-2010, for example, the Ministry of Agriculture and Agro-Based Industry (MOA) issued policy directions for various product groups, including fruit and vegetables. Essentially, these aimed at increasing production of fruit and vegetables to meet domestic demand and expand exports through improvements in technology and quality, with the government providing the needed institutional support, infrastructure and incentives for private sector ventures to undertake commercial production (Ministry of Agriculture, 1999).

To respond to challenges of assuring food safety and quality and enhancing efficiency of agricultural production, the MOA established quality assurance schemes for primary producers in the agricultural sector. These include the Farm Accreditation Scheme of Malaysia (SALM) for fruit and vegetables, launched in 2002, as well as schemes for livestock (SALT) and fisheries and aquaculture (SPLAM). SALM is a national programme to recognize and certify farms engaged in commercial fruit and vegetable production which adopt agricultural practices that are environment-friendly, sensitive to workers' welfare and yield quality products that are safe for consumption. This programme was revised in 2005. SALM-certified farms are entitled to use the "Malaysia Best" logo, which provides an opportunity to brand products in the marketplace.

Apart from SALM, which is implemented by the Department of Agriculture, Malaysia has developed the Malaysian Standard, MS 1784:2005 Crop Commodities-Good Agricultural Practices (hereafter referred to as "MS-GAP"). MS-GAP is a generic standard applicable to all crops – both food and non-food crops. Based on the framework of the generic standard, technical sub-committees have been drafting specific GAP standards on behalf of the Department of Standards Malaysia (DSM) for seven major crops: oil palm, rubber, cocoa, pepper, herbs, fruit and vegetables, and flowers and ornamentals. The standard for fruit and vegetables contains considerable references to the EurepGAP Protocol on Fruit and Vegetables and also takes account of the requirements established under the SALM programme.

When SALM was revised in 2005 it was made generally consistent with MS-GAP that was issued the same year, and which in turn had taken the original SALM into account in its development process. The revised SALM standard, based on MS-GAP, also includes rules and criteria that are derived from provisions of national laws to control hazardous impacts on the environment, food safety and workers' health and safety (not specified in the MS-GAP Standard),[42] as well as specific criteria of the EurepGAP Protocol for Fruit and Vegetables (also not specified in MS-GAP).

SALM and MS-GAP coexist. At the time of completing this monograph (September 2007), the Department of Agriculture had certified 190 farms under SALM. However, no farms had commenced

[41] Malaysia has a trade surplus if, apart from SITC 0, trade in SITC 1 (beverages and tobacco), SITC 22 (oilseeds and oleaginous fruit) and SITC 4 (animal and vegetable oils, fats and waxes) are also included.

[42] However, both SALM and MS-GAP require compliance with all relevant national legislation.

implementing MS-GAP, as its certification and auditing procedures had yet to be put in place. The Department of Agriculture has agreed to seek benchmarking of SALM to the EurepGAP standard.[43]

Malaysia's exports of FFV largely go to regional markets; only a small portion are exported to the EU or other developed-country markets. From this perspective, there has not been an urgent need for EurepGAP certification in the short term. However, benchmarking to EurepGAP is expected to increase recognition of SALM in international markets, thereby facilitating export to the EU – considered a premium market – as well as promoting trade with regional trading partners. A EurepGAP National Technical Working Group has been established in Malaysia, which is hosted by qa plus asia pacific sdn. bhd. (a Malaysia-based consultancy firm).

This chapter analyses Malaysia's experiences in the design and implementation of GAP schemes for fruit and vegetables, with special references to the benefits and obstacles to GAP implementation, implications for smallgrowers, the role of public and private sector agencies in providing extension services, development priorities to be taken into account in national GAP schemes and the pros and cons of benchmarking. It compares the revised SALM standard with the EurepGAP Standard for Fruit and Vegetables, and illustrates Malaysia's progressive approach to the implementation of a quality assurance system. Key concerns, challenges and opportunities in the implementation of GAP are presented through an analysis of strengths, weaknesses, opportunities and threats (SWOT analysis). The chapter concludes with specific recommendations.

The chapter shows that Malaysia has adopted a proactive approach in responding to food safety and quality requirements in its domestic and export markets and in the design and implementation of GAP standards. However, some challenges remain, such as the need for credible certification and adequate coordination between government agencies. Further efforts also need to be made to increase the acceptance of SALM in international markets so that it can play a greater role in facilitating access to those markets. To this end, Malaysia is embarking on a process aimed at benchmarking the SALM scheme to the EurepGAP standard for Fruit and Vegetables. Although this could eventually facilitate exports to the EU, it should be noted that the overwhelming proportion of Malaysia's FFV exports go to Singapore and other ASEAN markets. Therefore, the potential benefits, if any, of benchmarking SALM to EurepGAP in the context of regional trade (i.e. by moving towards harmonization and mutual recognition of national GAP standards) need to be carefully weighed. As a net importer of FFV, Malaysia has seen its imports grow rapidly in recent years, in particular from China and ASEAN. Therefore, the potential role, if any, of a national standard benchmarked to EurepGAP in helping to ensure that imported FFV meet the food safety and other requirements of the Malaysian consumer may also need to be explored.

Government agricultural policy, in particular concerning fruit and vegetables

The best agricultural land in western Malaysia has traditionally been used for lucrative plantation crops, in particular rubber and oil palm, pushing other crops such as fruit and vegetables to marginal areas. The first National Agricultural Policy (NAP), launched in 1984, promoted the use of available arable land for cultivation of export crops, particularly through the development of oil palm plantations. However, the second NAP (1992-2010) revised this policy, focusing on enhanced productivity, efficiency and competitiveness of the agricultural sector. Following the economic crisis of 1997, the Government gave renewed importance to the agricultural sector, with special attention to reducing the food import bill through enhanced and more efficient agricultural production. The policy was further refined in the third NAP (1998-2010), the main objectives of which are to: enhance food security, increase productivity and competitiveness of the sector, deepen linkages with other sectors, create new sources of growth for the sector, and conserve and utilize national resources on a sustainable basis. Under NAP3, policy directions were issued for various product groups, including fruit and vegetables.

The Government, within the framework of the Eighth Malaysian Plan (2001-2005), has provided various investment incentives to the private sector to venture into the production and processing of

[43] The Department of Agriculture and FoodPlus signed a memorandum of understanding on the occasion of the Seminar EurepGAP-SALM accreditation and export of agro-produce: Malaysia, Kuala Lumpur, 10 and 11 September 2007.

FFV. Tax incentives for commercial fruit production include pioneer status, an investment taxation allowance, a reinvestment allowance and an agricultural allowance. Priority is being given to the promotion of large-scale cultivation of fruit and vegetables, with a focus on the production of high quality fruit and vegetables for domestic consumption and export.

During the Eighth Malaysian Plan, fruit production grew at an average annual rate of 9.8 per cent. Strong growth in the production of vegetables (at an annual average rate of 13.8 per cent) has been attributed to the expansion of areas under cultivation, intensive implementation of estate-based activities and higher productivity as a result of good farming practices, as well as improvements in post-harvest handling (Ninth Malaysian Plan 2006-2010). The above-mentioned incentives also contributed to higher production.

Figures on agricultural land use indicate that in 2005, 4,049,000 ha were used for oil palm and 1,250,000 ha for rubber cultivation (table 7). With regard to FFV, 330,000 ha were used for fruit and 64,000 ha for vegetables. In addition, 180,000 ha were used for coconuts (Ninth Malaysian Plan 2006-2010, tables 3–7). Both the Eighth and Ninth Plans set targets for increasing land used for fruit and vegetables that were well above the overall targets for agricultural land use.

Table 7. Malaysia: agricultural land use

Crop	Hectares (thousands)			Annual growth rates (%)		
				Eighth Plan		Ninth Plan
	2000	2005	2010	Target	Achieved	
Oil palm	3 377	4 049	4 555	3.2	3.7	2.4
Rubber	1 431	1 250	1 179	-2.7	-2.7	-1.2
Fruit	304	330	375	5.1	1.7	2.6
Vegetables	40	64	86	4.2	9.9	6.1
Coconut	159	180	180	-0.6	2.5	0.0
Other selected crops*	582	510	516			
Total	5 893	6 383	6 891	1.5	1.6	1.5

Source: Ninth Malaysian Plan 2006-2010, tables 3-7.

* Padi, cocoa, tobacco and pepper.

Fresh fruit and vegetables sector

All aspects of horticulture can be found in Malaysia, including fruit growing, vegetable production in both open and protected structures (employing fertigation, or the application of nutrients through irrigation systems) and ornamental cultivation. The fruit and vegetables sector is small and fragmented. Tropical fruit are widely grown, either in mixed or single fruit orchards. Temperate vegetables are grown in the highlands and tropical vegetables in the lowlands.

There are about 5,000 farms involved in fruit and vegetable cultivation, the majority of which are smallholders. These are traditional farmers whose awareness of good agricultural practices is generally low. There are also a small but growing number of larger commercial farmers who are more receptive to change. Three different categories of farms are engaged in the production of food crops (box 4).

There was no significant change in the total area allocated for fruit cultivation between 2000 and 2004. However, there has been a significant increase in the fruit producing area resulting in a 90 per cent increase in total production.[44] Traditional fruit such as durians, bananas, rambutan and dokong[45] continue to dominate production, largely for the domestic market (table A.12).[46] With regard to

[44] The figures show marked differences in planted and producing areas, especially those for fruit. Planted areas include both mature and immature planting. Producing areas are only those that are actually yielding produce. In the case of vegetables, the difference between the two is minimal because of their short cycle to maturity, but for fruit it generally takes longer for the trees to reach fruit-bearing age (gestation period). For example, durian has a gestation period of 9 years, while that for jackfruit is 3.5 years, for mangoes 3 years and for papayas 9 months.

[45] A tropical fruit native to Thailand which has gained popularity in Malaysia.

[46] Other important fruit include duku langsat, pineapple and cempedak. Duku, dokong and langsat belong to the same species, *lansium domesticum*. Cempedak, a seasonal fruit, resembles jackfruit, but is smaller and with a stronger smell.

vegetables, 19 vegetable crops showed a significant increase in the area under cultivation,[47] particularly the area planted with "Asian" vegetables, such as spinach and kale, and "salad" vegetables such as lettuce, cucumbers and tomatoes (table A.13). Overall, the increased FFV production, especially of fruit, indicates improved efficiency and productivity of the farms (table 8).

Table 8. Malaysia: area, production and productivity of fruit and vegetables, 2000-2004

	2000	2001	2002	2003	2004
			Fruit		
Planted area (ha)	290 569	282 196	285 684	284 759	284 077
Producing area (ha)	113 416	114 914	160 363	159 551	160 860
Total production (tonnes)	965 634	1 037 411	1 494 908	1 629 146	1 833 974
Productivity (tonnes/ha)	3.3	3.7	5.2	5.7	6.5
			Vegetables		
Planted area (ha)	25 402	25 359	29 603	34 609	37 027
Total production (tonnes)	347 045	540 860	367 255	449 514	498 362
Productivity (tonnes/ha)	13.7	21.3	12.4	13.0	13.5

Source: Ministry of Agriculture and Agro-based Industries, *Agricultural Statistics Handbook 2004*. See also: http://agrolink.moa.my/moa/.

Domestic market for FFV

The domestic market for fruit and vegetables is growing at a rapid pace. The per capita consumption of fruit in Malaysia is 34 kg per year compared to an average per capita consumption of 63-150 kg per year in developed countries (FAO, 2003). Hence, as Malaysia progresses towards its goal of becoming a fully developed economy by 2020, there is considerable potential for an increase in the domestic consumption of fruit. This may result in increased local demand for GAP-certified produce, but could also provide opportunities for uncertified produce. It is estimated that about 75 per cent of the FFV produced locally end up for sale in the traditional markets, such as wet markets and local grocery stores. The traditional markets are still very active because they offer a "personal touch" to the consumer, are centrally located and therefore convenient for "small" shoppers, and are perceived as providing better value.

Trade in FFV

In 2006, FFV imports (fresh fruit, nuts and vegetables) totalled $591.3 million, compared to exports worth $184.7 million (table A.11). The export/import ratio (in value terms) for FFV was 31.2 per cent, for fresh fruit it was 55.5 per cent and for fresh vegetables 23.4 per cent. Malaysia is also a net importer of processed fruit and vegetables, but the trade deficit is smaller, with imports of $92.6 million and exports of $62.6 million in 2006. There was a trade deficit of $429.5 million for fresh and processed vegetables together, with an export/import ratio of 37.2 per cent.

Between 1997 and 2003, the export/import ratio for FFV showed a progressive increase, in line with Malaysia's objective to become a net exporter by 2010. However, imports have increased sharply in recent years and the export/import ratio in 2006 was similar to that of 1997. At the same time, exports in current dollars grew only very slowly. Since production has been growing (table 8), the recent decline in the export/import ratio may be attributed to a significant increase in domestic consumption of FFV.

Imports

Growing FFV imports, including of products that are not grown locally, can be attributed to changes in consumer preferences, which may be a result of the increasing affluence of Malaysian society. Another explanatory factor may be the rapid rise in the number of supermarkets at the expense of the traditional wet markets, which is also related to the fast changing lifestyles of consumers.

[47] The survey covered areas devoted to the cultivation of legumes and fruiting vegetables (lady's fingers, French beans, long beans, brinjals, cucumbers, chillies, angled loofah, bitter gourd and tomatoes); leafy vegetables (spinach, water spinach, lettuce, pak choy, chinese kale, cabbage, and choy sum); root vegetables (carrots, radishes and yam beans) and other vegetables (sweet shoots, spring onions, cauliflowers and pumpkins).

Supermarkets often promote imported, high-value fruit and vegetables. There are currently more than 400 supermarkets in Malaysia, of which 37 are located in the Klang Valley (Kuala Lumpur) area.

China is the principal supplier of FFV, accounting for 40 per cent of Malaysia's FFV imports in 2006 (up from 21.6 per cent in 1997), followed by ASEAN, India, the United States, Australia and the EU-15 (table 9). During the period 1997-2006, FFV imports from China grew by 156 per cent in value terms and the value of vegetable imports in 2006 was three times that of 1997. Over the same period, imports from ASEAN also grew significantly (38 per cent) and ASEAN's share in Malaysian FFV imports rose from 15.4 per cent to 21.7 per cent.

Table 9. Malaysia: imports of FFV, by principal suppliers, 2006

Imports from	($ million)				Share in total FFV imports
	FFV	Vegetables	Fruit	Nuts	
	591.3	446.9	124.1	20.4	100.0
China	236.6	195.8	39.1	1.7	40.0
India	63.4	59.7	1.0	2.7	10.7
Thailand	49.6	33.0	15.8	0.8	8.4
United States	46.6	19.5	19.1	8.0	7.9
Australia	37.2	26.0	9.9	1.3	6.3
Singapore	34.9	34.7	0.2	0.0	5.9
Myanmar	28.0	27.0	0.9	0.1	4.7
EU-15	20.0	18.2	1.7	0.2	3.4
South Africa	13.2	0.4	12.8	0.0	2.2
Indonesia	11.9	6.0	2.7	3.2	2.0
New Zealand	11.1	9.3	1.8	0.0	1.9
Iran, Islamic Rep. of	5.2	0.0	4.9	0.4	0.9
Viet Nam	3.6	2.0	0.6	1.0	0.6
Rest of the world	29.9	15.3	13.6	1.0	5.1

Source: COMTRADE.

The principal products imported into Malaysia are onions and shallots, garlic, dried leguminous vegetables, "other" fresh vegetables, cabbages, potatoes, apples and citrus fruit.

Exports

The average annual value of Malaysia's total FFV exports in 2004–2006 was $177.3 million, of which exports of vegetables amounted to $90.8 million (51.2 per cent), those of fruit to $75.4 million (42.5 per cent) and nuts $11 million (6.2 per cent).

Malaysia exports FFV mainly to ASEAN countries, the earnings from which amounted to $138.9 million or 75.2 per cent of the value of its total FFV exports in 2006. Another major market is Hong Kong (China) (table10 and figure 1)

Table 10. Malaysia: exports of FFV by principal markets, 2006

Export markets for FFV	Value ($ million)	Share in Malaysia's total FFV exports (%)
World	184.7	100.0
Singapore	102.3	55.4
Indonesia	18.4	9.9
Thailand	16.2	8.7
Other ASEAN	2.1	1.1
Hong Kong, China	13.2	7.1
EU-15	9.6	5.2
West Asia	8.6	4.7
South Asia	4.8	2.6
China	2.0	1.1
Other markets	7.6	4.1

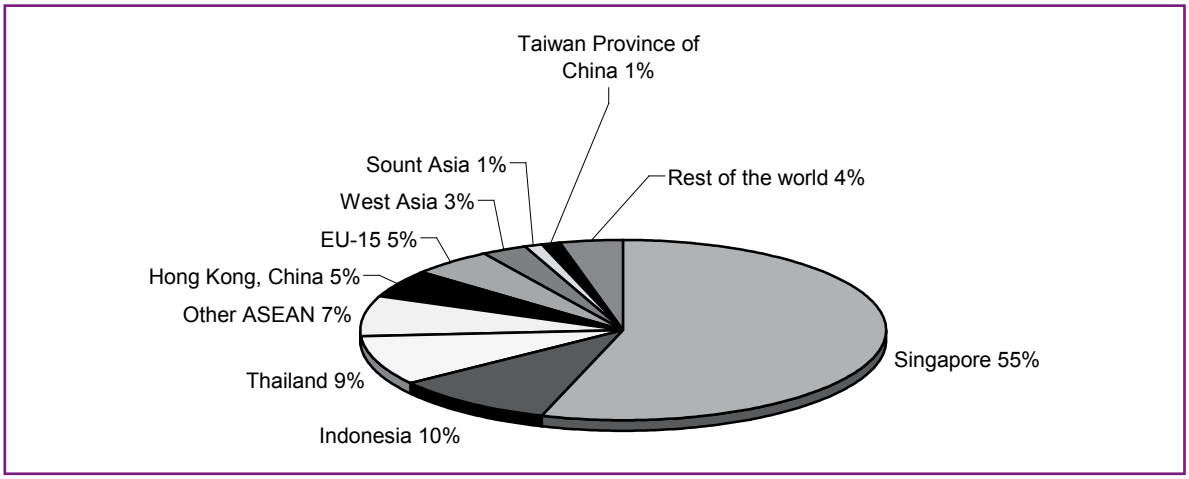
Source: COMTRADE.

Box 4. Farm categories for crop production in Malaysia

Three farm categories exist for crop production: (i) smallholders, (ii) land development schemes, and (iii) large commercial (estate or plantation) holdings. Smallholdings are classified as those having an area of less than 40 ha, and the majority have an average area of 0.5–3.0 ha. The smallholders are usually engaged in some form of mixed cropping, for example oil palm or rubber intercropped with other crops (mainly food crops). The productivity of small farms is often low, as are farmers' incomes. The Government of Malaysia, through the Ministry of Agriculture, is committed to help overcome this problem by grouping small farms into mini-estates and encouraging "group-farming" aimed at achieving economies of scale and sustainability in production through improved farm resource management. This key policy objective should improve the living standards of the rural small farmers who are mostly poor.

Various land development schemes have been initiated through the Federal Land Consolidation and Rehabilitation Authority (FELDA), the Federal Land Development Authority (FELCRA) and the State Economic Development Corporation. The FELDA schemes cover average holdings of 4 ha of agricultural land (planted with oil palm or rubber) with a 0.10 ha house lot for each farm-holding family. Large holdings (over 40 ha) generally belong to commercial plantations. Their production is usually well organized for both local and overseas markets, and almost all of them practice monoculture.

Figure 1. Share of main markets in Malaysia's FFV exports (by value), 2006



Source: COMTRADE.

The main categories of FFV exports in the period 2003-2006 are shown in table 11. Most exports of fresh fruit consist of tropical fruit, in particular papayas, a range of fruit falling under HS 080910 ("other" fresh or chilled fruit) such as star fruit, durians and rambutan, bananas, pineapples, mangoes, mangosteens and guavas. Exports of nuts include cashew nuts, coconuts and pistachios. Exports of vegetables include onions and shallots, garlic, tomatoes, chillies, beans, mushrooms, sweet corn, aubergines and "other vegetables".

Malaysia's experience in the development of quality management systems for FFV

In line with the objectives and national aspirations for self-sufficiency in FFV, the food and agribusiness industries need to be made more competitive, producing safe and quality products that can effectively satisfy both the domestic and world markets. The Ministry of Agriculture has responded to this need as well as to the challenges in the areas of food safety and quality by establishing quality assurance programmes for primary producers in the agricultural sector. Quality schemes have been launched for several sectors, including fruit and vegetables (through SALM), livestock raising (SALT) and fisheries and aquaculture (SPLAM).

Table 11. Malaysia: exports of FFV, 2003-2006

HS Code		Value ($ millions)					Share in total FFV exports, 2003-2006 (%)
		2003	2004	2005	2006	Average 2003-2006	
0701-0713, 08	FFV	169.7	176.1	186.1	184.7	179.4	100
0803-0814	Fruit	81.1	75.7	69.5	68.9	73.8	41.1
Major tropical fruit		39.6	33.7	25.6	26.4	31.3	17.4
080720	Papayas	26.5	21.9	15.5	14.0	19.5	10.9
0803	Bananas	6.5	5.5	4.7	6.8	5.9	3.3
080430	Pineapples	2.5	2.4	2.9	3.7	2.8	1.6
080450	Mangoes, mangosteens, guavas	4.1	3.9	2.5	2.0	3.1	1.7
Other (minor) tropical fruit		22.7	20.4	19.3	18.4	20.3	11.3
081090	"Other" fresh fruit	21.5	19.1	18.3	17.8	19.2	10.7
	Of which durian	8.9	5.7	5.4	4.5	6.1	3.4
081190, 091290, 081340	"Other" frozen, provisionally preserved or dried fruit	1.3	1.3	1.1	0.6	0.6	0.6
Other fruit		18.8	21.6	24.6	24.1	22.2	12.4
080711-19	Melons	13.4	14.7	17.9	17.7	15.9	8.9
0805	Citrus fruit	1.6	2.7	2.9	2.7	2.5	1.4
0808	Apples, pears and quinces	1.2	1.7	1.4	1.3	1.4	0.8
	Other	2.7	2.5	2.4	2.4	2.4	1.3
0801-0802	Nuts	10.0	9.8	13.2	11.3	11.2	6.2
080111-19	Coconuts	8.0	7.4	7.0	6.5	7.3	4.0
	Other	2.0	2.4	6.2	4.8	3.9	2.2
0701-0713	Vegetables	78.6	90.5	103.4	104.6	94.4	52.6
070310	Onions, shallots	19.4	26.1	26.0	20.1	22.9	12.7
070990, 071080, 071390	"Other vegetables"	12.1	11.9	14.2	17.3	13.9	7.7
0702	Tomatoes	8.9	9.3	11.8	10.3	10.1	5.6
070320	Garlic	7.3	9.2	8.0	8.5	8.3	4.6
070960	Chillies	4.8	5.0	6.1	6.0	5.4	3.0
070820	Beans	3.4	3.4	5.0	4.2	4.0	2.2
	Other	22.7	25.6	32.3	38.2	26.4	14.7

Source: COMTRADE.

SALM is a national programme developed to recognize and certify commercial fruit and vegetable farms that adopt agricultural practices which are environmentally friendly, sensitive to workers' welfare and yield quality products that are safe for consumption. Apart from SALM, the Malaysian Standard, MS 1784:2005 Crop Commodities-Good Agricultural Practices has been developed.

In 2004, the Ministry of Agriculture and Agro-based Industry also launched the organic certification scheme, SOM (Skim Organik Malaysia). Its objective is to guarantee consumers that the organic food products they may purchase are in fact organically produced. The scheme gives recognition to participants who cultivate crops according to the requirements outlined in the National Organic Standard, MS 1529. This standard for organic production is based on the FAO/WHO Codex Alimentarius Commission guidelines and the International Federation of Organic Agriculture Movements (IFOAM) Basic Standard.

The Farm Accreditation Scheme of Malaysia

The Farm Accreditation Scheme of Malaysia (SALM) was developed for farms producing FFV. The basic references used in developing it were the EurepGAP Protocol for Fresh Fruit and Vegetables, the

FAO Draft Document on Good Agricultural Practices and the WHO/FAO CODEX Code of Hygienic Practice for the Primary Production and Packaging of Fresh Fruits and Vegetables.

SALM is a national programme initiated and administered by the Department of Agriculture with the full involvement of the Malaysian Agriculture Research and the Development Institute (MARDI), FAMA, the Farmers Organization Authority (LPP), and other relevant government agencies such as the Ministry of Health. All decisions pertaining to SALM are made by a steering committee comprising representatives from these institutions, with the Department of Agriculture serving as the secretariat.

The approach used in SALM is incremental in nature aimed at continuous improvements, with implementation relying on minimum standards. The goal of the scheme is to get farmers to adopt and practice GAP as a work culture.

Concept of SALM

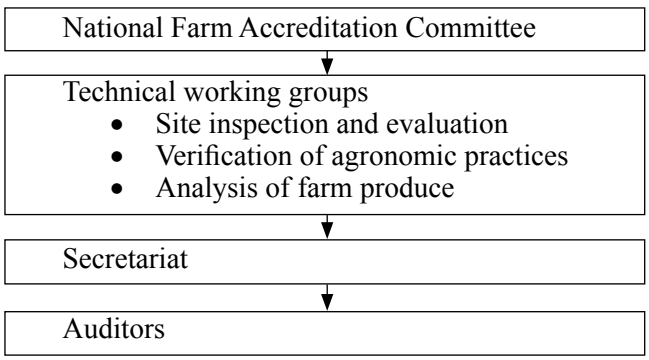
This programme is based on the concept of inspection and evaluation of farm and farming practices by inspectors (auditors) according to defined requirements consistent with GAP and conforming to national guidelines, standards and legislations. SALM includes site inspection, soil and water appraisal, observations of practices, interviews with farm operators and auditing, sampling and analysis of harvested produce for pesticide residues and heavy metals.

The programme contains 16 elements:

- Traceability
- Record keeping and internal audit
- Planting materials and rootstock
- Site history and site management
- Soil and substrate management
- Fertilizer management
- Irrigation and fertigation
- Crop protection
- Harvesting
- Post-harvest handling
- Pesticide residue analysis of produce
- Waste and pollution management
- Workers' health, safety and welfare
- Environmental issues
- Record of complaints
- Legal requirements

Organizational structure

The following outlines the organizational structure:



The National Farm Accreditation Committee consists of representatives of various government departments and agencies: Department of Agriculture, Ministry of Agriculture, MARDI, FAMA, LPP and the Ministry of Health. There is no private sector representation on the committee. The technical working groups include agricultural experts from the Department of Agriculture, which also serves as

the Secretariat for the National Farm Accreditation Committee. Auditors are trained personnel from that Department who, in addition to this role, have advisory and technical functions among others.

SALM certification

Certification is provided after auditors have visited farms to evaluate farming practices and their compliance with stipulated criteria. The criteria are grouped into "major must", "minor must" and "encouraged" categories. The revised SALM standard has 29 "major must", 76 "minor must" and 57 "encouraged" criteria. Farms conforming to 100 per cent of the "major must" plus 95 per cent of "minor must" criteria receive a certificate of official recognition.

The assessment and certification process in SALM can be outlined as follows:

1. Farmer registration
   - Application to Department of Agriculture
   - Prescribed forms
   - Farm is given a registration number

↓

2. Farm visit by first team of auditors
   - Soil inspection report
   - Soil survey report
   - Water analysis report
   - Reports assessed by Secretariat
   - Farm approved for next stage

↓

3. Farm visit by second team of auditors
   - Assessment of agronomic and plant protection practices
   - Farm records
   - Farm interview with operator
   - Observations through farm walks
   - Inspection of specific sites (stores, dumpsites, packing house)
   - Sampling and analysis of inputs (fertilizers, pesticides)
   - Sampling and analysis of produce (pesticide residues, heavy metals)

↓

4. Preparation and submission of Technical Report to Farm Accreditation Committee

↓

5. On acceptance, the farm is provided with a certificate that it meets GAP requirements

↓

6. Approval to affix SALM logo

↓

7. Surveillance audit is annual
   In the second year, only a farm audit and analysis of produce is conducted

Malaysian Standard on Good Agricultural Practice (MS-GAP)

A proposal was made in 2003 by qa plus asia-pacific sdn. bhd to SIRIM Berhad,[48] the national organization of standardization and quality in Malaysia, for the development of a Malaysian Standard for Good Agricultural Practice (MS-GAP),[49] which is essentially a code of practice setting guidelines for Malaysian farms and plantations that are consistent with environmentally sound agricultural practices,

[48] Formerly known as the Standards and Industrial Research Institute of Malaysia (SIRIM). SIRIM Berhad is owned by the Malaysian Government under the Minister of Finance.

[49] Initially, although the SALM programme is driven and owned by the Ministry of Agriculture, it did not have the status of an official national standard. This is because only standards developed by the Department of Standards Malaysia are legally considered as National Standards. SALM is now based on an official Malaysian Standard for GAP.

and with considerations of food safety and the health and safety of workers. This proposal was circulated for comments to all interested parties, including public and private organizations in the agricultural sector that were supported by the Department of Standards Malaysia. The proposal also suggested that the eventual MS-GAP be benchmarked with EurepGAP to gain wider international acceptance.

Work on MS-GAP started in early 2004 under the authority of the Food and Agricultural Industry Standards Committee (ISC A) in SIRIM Berhad, using a multi-stakeholder approach. A Working Group on Crop Commodities was established, consisting of a team of experts and representatives drawn from various government agencies, grower associations, exporter associations, major agricultural producers, consumer associations and smallholder organizations. The Chairman of FAMA was nominated Chairperson of the Working Group. The Department of Standards Malaysia approved the draft standard in January 2005 after considering the public comments.

The standard, MS 1784:2005 Good Agricultural Practice Crop Commodities, is generic in nature, applicable to both food and non-food crops. It is intended for use by certification organizations to recognize and certify farms that adopt GAP in Malaysia. Hence its development involved a considerable amount of referencing to the EurepGAP Protocol on Fruit and Vegetables, also taking into account the requirements established under SALM.

Based on the framework of the generic MS 1784:2005, GAP-specific standards for the seven major crop commodities mentioned in the introduction of this chapter have been developed by technical sub-committees consisting of experts.

The MS-GAP was officially launched on 19 December 2005 and is administered and managed by SIRIM-QAS, the National Certification body, which is accredited by the Department of Standards Malaysia.

National laws and regulations incorporated in SALM/MS-GAP

In developing GAP criteria it is important to ensure that national legislation, guidelines and policies in relation to food safety, environmental protection and workers' health and welfare are not compromised. Both the SALM and MS-GAP standards meet the provisions of the following legislation:

- *Food Act 1983 and Food regulations 1985.* This Act is administered by the Ministry of Health and is enforced to protect the public against health hazards and fraud in the preparation, sale and use of foods;
- *Pesticides Act (1974) and Regulations.* The Pesticides Act is administered by the Pesticides Board. The Director General of the Department of Agriculture is the Chairman. The clauses in this Act detail conditions on the importation, manufacture, storage, sales and use of pesticides in the country;
- *Environmental Quality Act (1974) and Regulations.* The Act relates to the prevention, abatement and control of pollution, and protection of the environment. It is administered and enforced by the Department of Environment Malaysia;
- *National Land Codes* on development;
- *Occupational Safety and Health Act 1994.* This Act has further provisions for securing the safety, health and welfare of persons at work and for protecting others against safety or health risks in connection with the activities of persons at work; and
- *Occupational Safety and Health Act Regulations 2000 (Use and Standards of Exposure of Chemicals Hazardous to Health – USECHH 2000).* This Act emphasizes the identification of chemicals hazardous to health in the workplace, specifies permissible exposure limits, and provides for the assessment of risks to health, monitoring of exposure, health surveillance, protection and record keeping. It is administered by the Department of Occupational Safety and Health.

Obstacles to GAP implementation

In general, farmers, particularly small farmers, have a low level of awareness of the impacts of their farm practices on food safety, the environment and workers' health, safety and welfare. Most small

farmers are from the rural areas where traditional farming methods and subsistence farming are practiced. For them, lack of economies of scale is a further obstacle to effective GAP implementation. Furthermore, certification to GAP schemes does not guarantee higher prices than those of produce from farms without certification.

Commercial farmers, who interact directly with exporters, are more knowledgeable of the changing market requirements and are therefore more receptive to change.

Further challenges to GAP implementation are listed in the conclusions and recommendations section below, in particular under weaknesses and threats.

Impact of SALM

A significant number of farms have received SALM certification, although progress has been below expectation, principally because there have not been a sufficient number of auditors. Until November 2005, a total of 150 farms out of 930 applications had been certified. A large proportion of the producers that have obtained or are seeking certification are commercial farmers who have their own established markets.

SALM-registered farms tend to be given preference as suppliers in the local market. Although SALM may thus offer a degree of product differentiation, price premiums are usually not obtained (personal communication with the Deputy Director, Department of Agriculture). SALM-certified farms are also eligible for the Malaysia Best logo, administered by FAMA. The Malaysia Best branding is based on a grading standard as specified in the Malaysian Standard for specific fruit approved by the DSM.

At present, the SALM scheme is not recognized in overseas markets, and therefore does not facilitate market access. However, through a bilateral arrangement with Singapore, consignments of produce from SALM-certified farms are sampled and can be sent to retail distribution centres without detention at customs. On the other hand, consignments of produce from non-SALM certified farms are held at the point of entry until pesticide residue analysis results of the products become available.

Some have argued that the SALM programme does not exhibit sufficient transparency and credibility in its implementation because of the lack of independent third-party certification. This is because it is both managed and audited by the Department of Agriculture. The Department has acknowledged this problem and is now attempting to redress it.

Some of the commercial farmers that target overseas markets are seeking international recognition of GAP practices for their farms. At the time of drafting, three farms supplying fruit to Europe had obtained EurepGAP certification. Some farms supplying produce to traders who sell to the local hypermarkets (e.g. Tesco) are required to meet quality specifications, in line with the requirements of Tesco's Nature's Choice programme.

Development priorities that need to be reflected in a national GAP

From a development perspective, a number of factors need to be considered in the development and implementation of national GAP schemes, in particular:

- A vision for the agricultural sector should be formulated from a macro-level perspective and on a micro-scale. Objectives must be clearly identified to serve as milestones on the road to realizing the vision;
- The basic problems faced by the farming community in the country must be identified;
- Farmers must be made aware of the need, impact and benefits of subscribing to GAP;
- It is useful to examine some of the experiences and results obtained by other countries in implementing GAP;
- In the development of standards for a national GAP, it is essential to ensure that it is achievable and economically viable. It may be necessary to adopt a two-tier approach, comprising a basic standard satisfactory for local requirements and an export standard that will fully satisfy the requirements of premium markets such as the EU. This approach would encourage farmers

initially to satisfy their immediate market requirements and position them thereafter to move towards meeting the more demanding export standards;

- The strategy for adoption and implementation of national GAP systems should take into consideration pertinent issues that small farmers face in their trade. Adopting a gradual two-level strategy based on market differentiation would be a more appropriate procedure to implementing GAP. In Malaysia, about 75 per cent of the FFV produced is sold through traditional wet markets and grocery stores and comprise a large part of produce from small farmers. Prioritizing the implementation of food safety and adoption of traceability systems as the first level of approach rather than attempting to fulfil all the requirements in the GAP scheme e.g. SALM or EUREPGAP is recommended. The small farmers may be more amenable to adopting these requirements rather than addressing all the issues of GAP at the same time e.g. environmental, social and welfare issues etc. Apart from encouraging the small farmers to join the scheme, the approach would ensure that the produce is safe and traceable to the source thereby providing the confidence to domestic consumers. On the other hand, for the larger commercial farmers, who are supplying to local retail supermarket supply chains or exporting to Singapore or other international markets with more exacting requirements, their approach would be to achieve full compliance to SALM or EUREPGAP or SALM benchmarked to EUREPGAP (now GLOBALGAP).
- Pragmatic solutions must be available to farms in the GAP implementation process;
- Adequate technical and institutional capacity should be developed in government agencies and/or the private sector to ensure essential support for farmers. In this regard, it is important to establish a mechanism for cooperation between the various agencies providing services to farmers;
- The various organizations that are involved in the planning, management and implementation of national GAP schemes must have a clear understanding, knowledge and commitment to their objective; and
- The conduct and respective roles of farm inspectors and auditors must be clearly defined to avoid an overlap of functions. They should receive adequate training to ensure consistency and objectivity in the tasks they are required to perform.

Role of the public sector and agencies in the provision of extension services

Apart from the Department of Agriculture, which operates under the Ministry of Agriculture and Agro-Based Industries, there are a few other private and public agencies that are involved in providing extension services. The statutory public agencies are FAMA, MARDI and the Farmers' Organization Authority (FOA), while the Malaysia Fruit Exporters Association is a private sector body.

The extension services rendered by the Ministry and Department of Agriculture at State level are vital for disseminating, implementing and managing GAP. Assistance provided to the farmers covers issues such as testing, GAP concepts and bookkeeping. In addition, training and awareness courses are conducted for the farmers on a regular basis.

Federal Agricultural Marketing Authority

The role of FAMA is to supervise, coordinate, regulate and improve the marketing of agricultural produce – both imports and exports. The main functions are as follows:

- Improve the efficiency and effectiveness of supply chain management;
- Improve market access of agricultural produce;
- Supervise and coordinate relevant agricultural marketing activities of the private and public sectors;
- Promote branding of produce from SALM-certified farms through the Malaysia Best logo;
- Improve capacity-building activities; and
- Issue licences for the export of papayas and carambola (starfruit).

FAMA assists farmers to get better prices for their produce. Its contract-farming programme reduces the multi-layer marketing channels to a minimum. This programme, directly supervised by FAMA,

guides farmers on the types of products they should consider producing and the time needed to produce them. FAMA also provides farmers with information on daily spot prices as guidance for dealing with middlemen. In addition, it provides venues throughout the country for farmers to sell their produce directly to customers, assists in organizing direct supply to supermarkets and gets involved in negotiations on price and terms of delivery.

FAMA manages the Malaysia Best logo for branding of fruit produced by SALM-certified farms. Once farms are certified, FAMA auditors carry out the grading of the fruit based on visual quality specifications (e.g. colour and shape), as indicated for each type of fruit in the Malaysian Standard. FAMA provides advisory services on handling and packaging of farm produce (i.e. ex-farm gate), but agronomic practices on the farm are covered by the Department of Agriculture under the SALM programme.

As mentioned in box 2, FAO studies have highlighted the important role of FAMA in linking growers with supermarkets in Malaysia (Shepherd, 2005). FAMA began supplying supermarkets and hypermarkets in 2000. It operates contract-marketing arrangements with a large number of producers of fruit and vegetables, livestock, fresh-water fish, coconuts and other produce. Farmers produce according to strict cropping schedules designed to ensure consistency of supply. The main fruit considered suitable for such arrangements are watermelons, melons, mangoes and pineapples, while the main vegetables are chillies, pumpkins, ginger and ladies fingers (okra). Farmers are encouraged to follow GAP. FAMA operates 44 collection centres, which channel produce into seven distribution centres for delivery to the stores. This is not an exclusive arrangement and supermarkets also obtain supplies directly from farmers and wholesalers.

Malaysian Agricultural Research and Development Institute

MARDI's function is to carry out research into innovative technologies for the development of the food and agricultural industries. In addition, it provides consultancy and technical services for these industries. MARDI also cooperates in all the research and development activities related to GAP.

MARDITECH

This is the commercial business arm of MARDI, incorporated in 1992 to exploit MARDI technology and expertise. Its objectives include accelerating the uptake of research results, facilitating technological innovations and imparting professional management experience in order to help develop successful agribusinesses. MARDITECH seeks to achieve this by establishing a vital link between the scientific work of MARDI and the industry. It identifies feasible concepts, ideas and prototypes and helps translate them into commercial reality for business opportunities and growth.

The services provided by MARDITECH cover the following:

- Techno-business due diligence and feasibility studies;
- Food production and process development;
- Consulting on food quality assurance and food safety;
- Technology development and innovation services; and
- Policy, strategic and economic studies.

Farmers' Organization Authority

The Farmers' Organizations Act 1973 was enacted with the specific aim of reorganizing the farmers' associations and agro-based cooperatives, which previously had been registered under different acts and governed by different ministries and departments, into a single entity – the Farmers' Organization Authority (FOA). Previously, a large number of organizations had been responsible for promoting the economic and social welfare of farmers in rural areas, resulting in an overlap of functions. At present, there are 285 farmers' organizations and 422 agricultural cooperatives under the jurisdiction of the FOA.[50]

[50] The 285 farmers' organizations consist of a single National Farmers' Organization (NAFAS), 13 State farmers' organizations (SFOs) and 271 area farmers organizations (AFOs). Around 700,000 farmers are members of AFOs.

The objectives are to increase the involvement of farmers' organizations in the production, marketing and processing of agricultural produce, and to help generate income for them and their members. Specific objectives are:

- Create 5,000 farmer entrepreneurs in the next two years, who will contribute towards national food production;
- Strengthen the financial position of the farmers' organizations to a level where they will be able to fully bear all operational costs;
- Strengthen the organizational structure of the farmer's organizations at national, state and district levels (known as the three-tiered structure);
- Inculcate a business culture and ethics in the FOA and in the management and operations of farmers' organizations; and
- Support the development of the farming community through social and welfare activities.

Malaysia Fruit Exporters Association

The Malaysia Fruit Exporters Association is a private sector initiative to assist commercial fruit farms in marketing their produce. At present it consists of 18 members who occupy about 3,500 acres of agricultural land. The size of the farms ranges from 50 acres to 300 acres. The members of the Association account for nearly 75 per cent of the total quantity of fruit exported from Malaysia directly through the Kuala Lumpur International Airport. The association provides advisory services to farmers in implementing SALM on the farms. It also assists farmers in seeking greater market access, and represents the farmers in negotiations with the relevant authorities on issues concerning trade in fruit.

SALM and EurepGAP requirements compared

Malaysia's national GAP schemes and EurepGAP address a number of common issues, which may eventually facilitate benchmarking. A comparison of the requirements of the original SALM scheme and EurepGAP presented in earlier versions of this study showed that a large number of EurepGAP control points/compliance criteria (CP/CC) were not addressed or emphasized in SALM. For example, the original SALM standard did not include requirements concerning internal audit, risk assessment for new agricultural sites, and pre-harvest intervals, to mention just a few, which have now been included as "major must" in the revised SALM standard. Thus, although some differences remain, with the revision of SALM in 2005 its requirements largely conform with the relevant EurepGAP CP/CC (table 12).

One key difference is that certification of farms to the EurepGAP standard is carried out by accredited certification bodies, whereas in the case of SALM, the Department of Agriculture conducts the audit and certifies the farms.

Benchmarking Malaysia's GAP schemes to EurepGAP

Discussions with senior officials in the Department of Agriculture and FAMA clearly identified the need to gradually upgrade SALM to increase its acceptance in international markets, and thereby play a greater role in facilitating market access.

Both the SALM scheme and MS-GAP make references to the EurepGAP protocols on Fresh Fruit and Vegetables. This provides an advantage for the benchmarking exercise. The EurepGAP benchmarking option enables the establishing of equivalence between private or public schemes in different regions or countries on the one hand and the EurepGAP standards on the other. This way local regulations, needs and cultures can be reflected in the benchmarked standard while at the same time improving the credibility of the local agricultural sector among global retailers.

Table 12. Comparison of selected EurepGAP and SALM and requirements

Issue	EurepGAP CP/CC	SALM
Traceability	A documented traceability system must be in place that allows a registered product to be traced back or forward (CP/CC 1.1) (major must).	The produce shall be traceable to the farm where it has been originally produced (major must). Makes no mention of forward traceability.
Record keeping and internal self-inspection	A minimum of one audit must be undertaken annually (CP/CC 2.2) (major must).	Emphasizes up-to-date records (minor must). An internal audit must be conducted once a year (major must).
Varieties and rootstock (seed/rootstock quality)	It is recommended to keep a seed record/ certificate that guarantees the quality and origin of seeds (CP/CC 3.2.1) (minor must).	Does not require or recommend maintaining a record of the source of seeds and planting materials.
Site history	There must be documented assessment of food safety, operator health and environmental risk (CP/CC 4.1.1) (major must).	For all new agricultural sites, a risk assessment shall be carried out, taking into account (a) prior use of land, (b) potential impacts of the production on adjacent crops and areas, and (c) potential impact of activities carried out at adjacent areas (major must).
Crop protection/ pre-harvest intervals	Registered pre-harvest intervals must be observed (CP/CC 8.4.1). Pre-harvest intervals must have been recorded for all crop protection products (CP/CC 8.3.10) (major musts).	Pre-harvest intervals as described on pesticide labels shall be strictly adhered to (major must).
Produce handling	There must be documented evidence that workers have received basic instructions in hygiene before handling produce.	Does not require a hygiene risk analysis to be undertaken. This issue is addressed under post-harvest handling.
Post-harvest treatments	Covered by several CP/CC (some of them major musts) on the selection and application of post-harvest crop protection products, including the need to use only registered products and to record applications (CP/CC 13).	Includes several major and minor requirements for post-harvest treatment, which are in line with the EurepGap requirements.
On-farm facilities for produce	Several CP/CC (minor musts and recommendations) concern on-farm facilities for produce.	On-farm facilities for produce handling is not addressed.
Waste and pollution management	It is recommended to implement a documented waste reduction, waste management and pollution action plan (CP/CC 11.2) (recommended).	It is recommended to develop and implement an action plan to avoid or reduce wastage and pollution (recommended).
Worker health, safety and welfare	It is recommended to carry out a risk assessment for safe and healthy working conditions, establish a documented action plan and provide training (recommended).	Does not require a risk assessment to be conducted, although it is encouraged to have an action plan in place to promote safe and good working conditions (encouraged).
Environmental issues	Contains several recommendations on environmental issues (CP/CC 13). The farmer should understand and assess the impact of his/her farming activities on the environment (recommended).	Crop producers shall conform to existing legislation relating to air, water, soil, biodiversity and other environmental issues (minor must).
Complaint form	All complaints related to compliance with EurepGAP must be adequately considered and followed up (CP/CC 14) (major must).	Records of complaints concerning non-compliance with the requirements of the standard and remedial action must be available on site (major must).

The EurepGAP benchmarking procedure involves the following steps:[51]

1. Application
2. Preliminary technical review
3. Peer review
4. Independent technical review
5. Independent witness assessment

[51] For a detailed analysis, see Garbutt and Coetzer, 2005.

6. Technical Standards Committee (TSC) review
7. Notice of intent to approve
8. Provisional approval
9. Approval

Developing or adjusting a national standard so that it can be benchmarked against the EurepGAP standard may involve both one-off and recurrent adjustment costs. These costs can be significant. In addition, the standard owner has to pay fees and incur other administrative costs. The EurepGAP benchmarking fee schedule for the Fruit and Vegetables Standard is as follows:

	Australian dollars	US$
Standard owner application fee	6,400	5,818
Independent assessment (scheme owner witnessing fee)	2,400	2,182
Travel fare, travel time and application processing	5,000	4,545

Converted to US dollars using an exchange rate of US$1 = 1.10 Australian dollars

This part of the benchmarking exercise would cost the GAP scheme owner about 15,000 Australian dollars (around US$13,636). The fee, although not prohibitive to the owners of local standards in Malaysia, could be expensive for many developing countries.

Summary and conclusions

Opportunities and challenges in the implementation of national GAP schemes

The key issues, specific constraints, concerns and challenges concerning the implementation of GAP are reflected in the following analysis of strengths, weaknesses, opportunities and threats (SWOT analysis):

Strengths

- The national GAP programme has been adopted as part of the national agenda for the entire Malaysian agricultural sector, in particular horticulture, livestock and fisheries;
- The Ministry of Agriculture and Agro-based Industries, and other agencies which share responsibilities for agriculture in Malaysia, in particular MARDI, FAMA, and LPP, are the driving forces of the national GAP scheme;
- The Department of Agriculture is fully responsible for the management of the national GAP scheme and provides free services to farmers for the implementation of the programme. The costs of sampling and testing of the soil, water and produce for pesticide residue and heavy metals are borne by the Department. The farmers are assisted with specific pre-formatted checklists to manage record keeping on the farm;
- The Department of Agriculture has positioned extension officers in every state throughout the country to assist farmers in the implementation of the programme;
- FAMA has set up the infrastructure to enable collection centres to provide an outlet for farmers to sell their products to traders and large national retailers. This guarantees the marketability of the farmers' produce; and
- FAMA has launched the contract farm concept which encourages selected large farms to obtain SALM certification and to source produce from SALM-certified farms. FAMA helps identify local and export markets and provides the Malaysia Best logo for branding of produce that conforms to specified criteria.

Weaknesses

- The majority of the farmers are smallholders. Many are traditional farmers who grow for their own consumption, selling the remainder in their neighbourhood. Small farm size tends to be an obstacle to GAP implementation;
- The educational and literacy levels of smallholder farmers are generally low;

- The farms are situated in rural areas in remote, non-contiguous locations, where logistics can be a major constraint;
- Farmers with small plots and in remote, rural locations are often dependent on middlemen and generally obtain rather low prices for their produce, which makes it difficult to bear the costs of adjustments of production to meet GAP requirements;
- The small farmers are poor and find it difficult to adopt the changes necessary for implementing SALM without financial assistance. The Department of Agriculture estimates that the cost per farm per year of implementing SALM is in the range of 5,000–10,000 ringgit ($1,500 to $3,000).[52] This is an estimate of the initial costs for a small farm in the first year, including investment in basic facilities such as a storage shed and washing facilities, the application fee, certification audit, soil investigation, and soil, water and produce analysis for the surveillance audit. In the subsequent years, the main costs incurred are for analysis of produce and residue levels and the surveillance audit. Three analyses need to be conducted (i.e. for organo-phosphates, organo-chlorines and heavy metals). Each test costs 450 ringgit. The auditor's fee is usually around 1,000 ringgit ($300). At present, the Department of Agriculture absorbs the cost of analysis and audit;
- The mind-set of small farmers makes it difficult for them to understand the benefits of implementing a GAP scheme, especially since implementing SALM does not guarantee a premium price for their products while it entails additional costs;
- There is a general lack of knowledge and understanding of the concepts of GAP and of the reasons why the Government has embarked on this project;
- There is a general concern that implementing SALM on the farm involves considerable documentation and paperwork with which the farmers feel they may not be able to cope;
- At present, the Department of Agriculture serves as judge and jury for implementation of SALM. The extension officers situated in the various offices throughout the country provide farmers with both advisory and consultancy services with regard to SALM implementation procedures. The Department's officers at headquarters conduct the audits on the farms;
- The certification process is generally slow, largely due to an insufficient number of auditors. By the end of 2005, of a total of 930 applicants, only 150 farms had been certified. The Department of Agriculture has about 80 auditors, who work on a part-time basis in addition to other duties;
- The auditors use a "soft approach" for auditing, as it is feared that strict auditing may work against the objective of getting more farmers to subscribe to SALM, which is still a relatively new scheme. While identifying cases of non-compliance on the farm, the auditors also provide advisory services. This may cause conflicts of interest;
- Applicants to SALM must initially pay about 120 ringgit ($36) for registration, which covers site inspection, and soil and water analyses. This is a requirement prior to conducting the audit. However, farmers are reluctant to pay for this service;
- The auditors take samples of produce for pesticide residue testing and heavy metals analysis at the time of a visit. The testing is undertaken free of charge by the Department of Agriculture's laboratory, which is accredited under the SAMM scheme (the Accreditation Scheme for Malaysian Laboratories). These tests are expensive and unless the Government continues to underwrite their costs, small farmers will not be able to subscribe to the scheme. The total testing charges for the three tests for organo-phosphates, organo-chlorines and heavy metals are approximately 1,350 ringgit ($403) per sample;
- Farmers lack knowledge of integrated pest management (IPM), and therefore tend to resort to excessive use of chemicals. In contrast, the large commercial farmers who produce for export markets are aware of the need to comply with MRL requirements through their customers. The small farmers' customers, on the other hand, are usually traders and middlemen, who are very price conscious and only supply to domestic markets;
- In Malaysia there is a general lack of consumer awareness of GAP and its potential contribution to food safety, quality and environmental protection. As a result, there is little or no pressure

[52] At the rate of US$1 = 3.35 ringgit.

from informed consumers, and farmers do not see an urgent need to adopt GAP; and
- Government agencies tend to be very departmentalized and individualistic, and do not appear to take a holistic approach to the implementation of GAP as part of a national agenda. Cooperation between the various government agencies dealing with the agricultural sector needs to be encouraged and their activities better coordinated.

Opportunities

- A framework for GAP implementation has already been created;
- The Government, under the Ninth Malaysian Plan, has already approved the setting up of three additional laboratories (in Ayer Hitam, Besut and Cameron Highlands) to carry out testing of fresh produce. Laboratories housed at the University of Science Malaysia (USM), MARDI and the Chemistry Department of the Department of Agriculture will have the necessary facilities for conducting tests. This will help clear the present bottleneck in testing;
- The Department of Agriculture has indicated that it is pursuing an agreement with SIRIM-QAS to outsource third-party auditing and certification, though it will continue to conduct internal audits. This will reduce the burden on the Department and will also improve the credibility of SALM;
- The Department of Agriculture realizes that in order to gain market acceptance and recognition, the SALM programme will need to be upgraded. It may eventually adopt the MS-GAP, once that is fully operational, to supplement SALM;
- There may be an opportunity for benchmarking of either SALM and/or MS-GAP to the EurepGAP standard, both of which make frequent references to the EurepGAP standard;
- The concept of farmer group associations is being encouraged by FAMA and the Farmers' Organization Authority. This augurs well for the implementation of GAP, as small farmers could be guided and motivated by those associations;
- In the Permanent Food/Fruit Park (TKPM) project initiated by the Government, which sets up clusters for specific crops in identified locations/regions, requirements for SALM certification have been specified. So far, 10 regions for different fruit have been identified under the cluster concept. The Government provides State lands and the necessary infrastructure, and the land is leased out to private companies; and
- Implementation of SALM or MS-GAP on farms can translate into improved productivity and efficiency.

Threats

- Since Malaysia is a net importer of fruit and vegetables, the shortage of supply enables farmers to sell produce with or without quality specifications. Combined with the absence of incentives or price premiums for products from SALM-certified farms, this may discourage producers from seeking certification;
- Delays in inspection and certification of farms, due to the shortage of auditors, could dampen interest in the GAP programme. Efforts are being made to address this problem, and
- Because of the low level of consumer awareness of sustainable agriculture, food safety and quality in Malaysia, there is little compulsion for farmers to adopt GAP. A heightened level of consumer awareness on these issues could lead to greater demand for quality and safe food in the domestic market and put greater pressure on farmers to adopt GAP.

Conclusions and recommendations on key issues

To facilitate compliance with GAP requirements and the implementation of national GAP schemes, a number of specific issues need to be addressed, including awareness-raising, auditing, testing of soil, water, chemicals and chemical residues, and the need to keep documents of GAP implementation.

Awareness-raising

Workshops and dialogues on key issues pertaining to sustainable agricultural practices, food safety, social responsibility and trends in demands of consumers and retailers, particularly relating to FFV, are useful for educating and encouraging the adoption of proactive adjustment strategies. Ultimately, this will assist the sector in taking advantage of an existing and growing market and in enhancing competitiveness. The policy dialogues and case studies supported by UNCTAD are useful for enhancing understanding of country-specific problems, finding solutions, encouraging compliance and, eventually, assisting developing countries in their efforts to gain market access. Such policy dialogues also provide a platform for further discussions between government departments, relevant agencies and private organizations, especially on matters pertaining to government's role, identifying the limits of its involvement and defining the kinds of alliances that need to be forged between the different stakeholders.

UNCTAD, in cooperation with other relevant institutions, such as the FAO, should continue to contribute to raising awareness and addressing trade and development issues in the area of public and private sector standards, including issues of harmonization and equivalence. UNCTAD, in particular the Consultative Task Force, could play a role in the following key areas:

- Promoting and backstopping well-informed, multi-stakeholder dialogue on voluntary requirements and their implications for market access, in particular between governments and other stakeholders (including discussions on trends, adjustment requirements and adjustment approaches) at national and regional levels. At the regional level, this could include comparative analyses and exchange of national experiences.
- Facilitating conceptual discussions on the most appropriate approaches to national GAPs and their ultimate benchmarking.

The FAO could play a role in providing assistance in training on integrated pest management (IPM) at all levels.

Auditing

Auditing of practices is to a large extent a subjective activity, which could result in variation in conformity assessments, thereby raising doubts as to the credibility of GAP implementation and the certification standard. Auditors should therefore be trained to ensure consistency in appraisal of practices. The auditing body and auditors must be competent and should be seen to be independent of the farm or farm group being audited. The auditor should not assume any role related to either advisory or extension services in order to avoid conflicts of interest.

Donors and relevant international and regional organizations could provide assistance for targeted training programmes for agricultural auditors to enable them to assess farm practices on tropical and subtropical fruit and vegetable farms in a consistent manner. This would give greater credibility to the auditing and certification process in various countries of ASEAN. It should also help remove perceptions of 'hard" (strict) and "soft" (permissive) auditors.

Testing

Testing is a major constraint in the promotion of GAP certification. Developing countries may not be sufficiently equipped and may lack the skills to conduct the necessary chemical analyses to ensure conformity. In addition, the capital expenditure for equipping and running a laboratory can be prohibitive for most developing countries. Moreover, the requirement for the laboratory to be accredited to a specific standard (as in EurepGAP, which requires laboratories to be accredited to ISO 17025 or an equivalent standard for testing)[53] could become a barrier in the future.

Sampling schemes and testing procedures may need to be standardized. As the majority of farmers are small or medium in size, it may be difficult for them to bear the cost of testing for chemicals

[53] Control points on crop protection residue analysis (CPCC 8.7) and water quality (CPCC 10.2).

and residues. It would be useful for the FAO and other relevant agencies to support experts in the development of "indicator" tests to show whether the residue levels are "below", "borderline" or "above" the specified amounts. Borderline tests could then be repeated with a full analytical protocol. This approach would be less expensive and quicker for quality control purposes, and thus more easily affordable by farmers.

Documentation

Keeping documentation as evidence of implementation of good agricultural practices is an important feature of the GAP standard. It permits traceability and provides information on chemicals used and their dosage. However, record keeping can be onerous and complicated when devised by individual farmers. In addition, auditing of such records can be time-consuming. In the case of the SALM scheme, compliance with 17 major requirements has to be documented by the farmers. Some efforts are under way to assist farmers in record keeping. For example, the Department of Agriculture gives assistance to farmers in devising and maintaining their records, and the Malaysian Fruit Exporters Association – which accounts for some 75 per cent of fruit exported from the Klang Valley – employs a consultant who maintains records for the farms.

It would be useful if a GAP documentation system were to be tailored to the product type and a standard format developed for farmers. Farmers could be trained in the maintenance of the records and explained the rationale and need for this. A further step would be to customize the GAP software for maintenance of records. This would be useful for farmer groups and cooperatives, while the centralizing of records would facilitate documentation audits by the auditors. With such a system in place, auditors would not need to travel to remote farms to conduct documentation audits. A central, computerized system could also be used to remind farmers of activities that are overdue and issue warnings concerning any lapses in maintenance of the required documentation. Additionally, software could be developed to provide exporters and retailers with the necessary information on, for example, traceability and chemicals used.

Annex: List of experts interviewed for the Malaysia country case study

The following experts were interviewed and farm visits carried out by the authors of this country study:

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In addition, a farm visit to a vegetable farm managed by farmers' organizations located in Bentong, Pahang, and a site visit to an agricultural site intended for FFV production owned by a large corporation in Lembah Beringin were made.

V. NATIONAL EXPERIENCES: THAILAND[54]

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Introduction

Thailand is ASEAN's largest exporter of FFV with an export value of $511 million in 2005 (this excludes manioc for the reasons given in chapter II. Including manioc, FFV exports would be worth $830.7 million). In the period 2003-2005, fruit exports accounted for 55 per cent, on average, of the value of Thailand's total FFV exports, vegetables for 39 per cent and nuts 6 per cent. Including processed products, Thailand's fruit and vegetable exports were worth $1.6 billion in 2005 (table 3).

FFV production poses certain challenges, such as inefficiencies in production and post-harvest activities and the impacts of often improper use of agrochemicals on food safety, the environment and occupational health and safety. Thailand's FFV exports face increasingly stringent food safety and quality requirements in external markets, such as government regulations concerning MRLs as well as private sector requirements. Thailand has been responding proactively to such challenges, including through the development of a national GAP programme (the Q-GAP), which pays special attention to food safety.

Food safety is an important issue in Thailand, and a priority of the Department of Agriculture. The year 2004 was declared the Year of Food Safety, and in 2005 the National Bureau of Agricultural Commodity and Food Standards (ACFS) published a Road Map of Food Safety. The Department of Agriculture has set up a food safety programme that contains strategies on: (a) agricultural inputs and raw materials, (b) production at the farm level, (c) control of crop protection products, and (d) quality crop production. More recently, Thailand has launched the "kitchen of the world" project.

As in other ASEAN countries, such as Malaysia (see previous chapter), in Thailand the development of the national GAP scheme has been largely driven by the Government, in particular by the Ministry of Agriculture and Cooperatives (MOAC). In addition, a regional GAP programme in the western part of Thailand (known as the "Western GAP cluster") exists, which was developed using a bottom-up approach. Farmers who fulfil the requirements of the national GAP programme can label their products with the GAP logo: the "Q" quality mark, which is a third-party certification system owned by MOAC. The Western GAP cluster has its own quality mark.

This chapter first analyses the possible implications of the EurepGAP standard and national GAP initiatives against the background of the regional pattern of Thai FFV exports and producer profiles/supply chains for selected crops: baby corn, asparagus and mangoes. It then analyses key issues related to the development and implementation of national GAP schemes in Thailand. The final part presents recommendations.

Baby corn, asparagus and mangoes are grown mainly by smallholders (box 5). Links with export markets are indirect, through packhouses and exporters under contract farming arrangements. In some sectors, there are additional actors in the supply chain. For example, for most producers of asparagus and baby corn, small-scale growers generally have links with packhouses and exporters through collectors. This is because intensive cropping methods make baby corn, and especially asparagus, particularly suitable for small-scale production. Mango producers, however, tend to link directly with packhouses and exporters. Therefore information on market requirements, including agricultural practices and food safety, is transmitted differently. The largest number of farms certified under the Department of Agriculture's Q-GAP are involved in mango production (7,762 farms by the end of 2004), followed by asparagus (3,803) and baby corn (1,903).

[54] This study is based on work carried out in the context of the CTF project, Reflecting National Circumstances and Development Priorities in National Codes on Good Agricultural Practice that can be Benchmarked to EurepGAP. It also draws on presentations made at the ITD/UNCTAD National Stakeholder Workshop on Good Agricultural Practice and Food Safety – Implementing EurepGAP in Thailand, held in Bangkok, 25 and 26 November 2005, and the ITD-UNCTAD workshop on WTO agreements and EU requirements on SPS, TBT and Environment: Challenges and Opportunities for Thailand's Agri-business, held in Bangkok on 24-25 May 2007. Presentations are available on the ITD website: www.itd.chula.ac.th/index.shtml. An earlier version of this chapter was presented in UNCTAD 2007a.

With regard to the regional pattern of trade, a significant share of baby corn export goes to the EU. Asparagus exports are directed largely to Japan and South-East Asia, and mango exports mainly to South-East Asia and Japan. Producers of baby corn who work with exporting companies (through collectors and brokers) that mainly target the EU markets may need to show compliance with EurepGAP requirements. Therefore, for them, EurepGAP certification is particularly important because 46 per cent of such exports (in volume terms) go to the EU. Such certification is less important for asparagus producers, as only 1 per cent (in volume terms) is directed to the EU. However, although EurepGAP certification is not required for entry into the Japanese market, certification may increase credibility and create a competitive edge.

Overall, Thailand exports FFV largely to regional markets, particularly China and Japan. GAP certification plays a certain role in exports to these markets. In some cases the Government is requesting exporters to source FFV only from the Department of Agriculture's GAP-certified farms. For example, exports of fresh durians and mangoes to China have to come from the Department of Agriculture's GAP-certified orchards (as with exports of pineapples to Australia). Compliance with GAP standards is also a relevant issue in the context of the Thailand-China bilateral trade agreement.

The share of Thai FFV exports going to the EU and the United States is relatively small, although higher than for most other ASEAN countries. FFV exports to the EU-15 were worth $65 million in 2005 (13 per cent of Thailand's total FFV exports), consisting largely of "other vegetables, fresh or chilled" (HS 070990) with an export value of $35 million (of which baby corn accounts for an estimated 70 per cent, according to EU import data).

With regard to exports to the United States market, private sector standards have not had a significant impact so far. This is partly because FFV imports have been restricted by phytosanitary regulations based on country of origin.[55] However, with improved access to that market for Thai fruit as of July 2007, private sector GAP standards may become more relevant.[56]

The second part of this chapter analyses the development and implementation of GAP schemes in Thailand. Concerning growers, the following are some of the major challenges to the effective implementation of a national GAP programme: insufficient awareness about safety, environmental and social impacts of agricultural practices, lack of knowledge and low levels of education, poor understanding of GAP requirements, poor record keeping, low motivation/incentives to implement GAP within the traditional FFV marketing system, unhygienic practices in production and food processing, and weak or no direct links with the market. At the level of government agencies, some of the challenges faced are: lack of clarity and a poor understanding of the role of GAP, insufficient dialogue with stakeholders, insufficient outreach and lack of coordination in training.

Currently, the entire Q-GAP certification process is carried out by the Government, from setting the standards and serving as the national regulatory body, to providing advisory services, carrying out farm inspection, and, finally, issuing the certification. Such an approach creates doubts as to the independence and credibility of the system and the certification. Ambitious objectives to certify a large number of producers may also have overburdened the Department of Agriculture's capacities and compromised the quality of certification. The private sector and other stakeholders have played only a limited role in the development of Q-GAP (but a larger role in the "Western GAP cluster"). Exporters, particularly those exporting to the EU, are more interested in certification against the EurepGAP standard or other schemes with broad buyer recognition. The modern retail sector may increasingly start to demand higher level third-party certification for the domestic market. The recently launched project of the Thai Fruit and Vegetables Producers' Association and Kasetsart University to set up a ThaiGAP with the aim of having it benchmarked to EurepGAP is an attempt to counter a multitude of

[55] The United States applies a system of individual country listings of fresh fruit and vegetables approved for entry (United States Department of Agriculture *Fresh Fruit and Vegetables Import Manual*). With the exception of a few products that may be imported from *all* countries, such as coconut, peeled garlic cloves and mushroom, no other FFV covered by the manual can be imported unless it appears on the list for the exporting country. Processed (e.g. dried and frozen) products are not covered by this listing. There are no approved FFV items listed for Viet Nam, and the list for Malaysia contains very few items. The list for Thailand is also small, but includes durian and certain types of asparagus.

[56] Following an amendment of the United States fruit and vegetable regulations, lychee, longan, mango, mangosteen, pineapple, and rambutan are allowed to be imported from Thailand as of 23 July 2007.

retailer GAPs, and thus avoid multiple certification requirements (box 2). The final part of this chapter presents recommendations.

The analysis in this chapter is largely based on interviews carried out by the author of the national case study in October and November 2005, and subsequent discussions in national and regional workshops. These interviews involved officials from government agencies and actors in the supply chains (growers, collectors/brokers and exporters) of each of the three crops (baby corn, asparagus and mangoes). The case study has been updated on the basis of further and more recent information obtained from government agencies and private sector organizations until mid-2007.

Production and exports of fresh fruit and vegetables

Thailand produced 11.3 million tons of fruit and vegetables in 2004, but its share in world production fell from 1.45 per cent in 1979-1981 to 0.82 per cent in 2004 (table A.1). Thailand's share in total FFV production of all developing countries fell from 2.52 per cent in 1979–1981 to 1.04 per cent in 2004.

Producers' profiles for selected export products

Most of the baby corn, asparagus and mango growers are smallholders. The farm size is generally between 0.8 and 1.6 hectares for asparagus growers, and between 0.24 and 0.32 hectares for baby corn growers.

Almost all small baby corn growers rely on collectors or brokers who link them with packhouses and manufacturers/exporters to sell their products. Agreements with collectors or brokers are not in a written form but based on trust. Collectors/brokers also impose different levels of agricultural practices and food safety requirements on farmers depending on the needs of the packhouses and the manufacturers/exporters they work with.

In the case of asparagus, almost all smallholders are members of grower groups. Contract farming is offered directly to the groups by packhouses and manufacturers/exporters. Most companies offer the groups set prices for one year with some minor adjustments (2 to 3 times a year) based on price fluctuations in the marketplace. As with baby corn, different companies require producers to conform to different levels of agricultural practices and food safety standards and these are specified in the contracts. The contracts also set strict specifications and prices for the different grades of produce, as well as guidelines for farming and accounting practices.

In the case of mangoes, exporters offer contract farming directly to the grower groups with prices set for one year. As with asparagus, different companies require different levels of agricultural practices and food safety requirements that are specified in the contracts.

There are a few large national exporters of asparagus and baby corn. All of them also operate their own farms and many have formed grower networks.[57] The producers include Taniyama Siam, Kampaeng Saen Commercial, Swift, and River Kwai. Some of the large national mango exporters also produce asparagus and baby corn, such as Kampaeng Saen Commercial and Swift.

To comply with the food safety requirements, most of the growers of asparagus, baby corn and mangoes have Department of Agriculture GAP certification (table 13). Packhouses and producers/exporters, working together with grower groups, have been quite effective in the implementation of GAP.

Asparagus and mangoes are exported mainly to Japan and other regional markets. In general, EurepGAP certification is not an important requirement; producers only need GAP certification issued by the Thai Department of Agriculture.

[57] For more information on large producers and exporters, see Boselie and Buurma, 2003.

Table 13. Thailand: number of DOA-GAP farms and Q-GAP certificates issued for baby corn, asparagus and mango sectors, end 2004

Crops	Number of GAP farms	Number of Q-GAP certificates
Baby corn	1 903	1 551
Asparagus	3 803	3 416
Mangoes	7 762	6 248

Source: Department of Agriculture, Technical One Stop Service, 2005.

The EurepGAP standard may have a significant impact on exporters of baby corn to the European markets, especially to the United Kingdom. The collectors/brokers managed by those exporters may require producers to comply with agricultural practices that meet EurepGAP requirements rather than those of the Department of Agriculture.

Trade in FFV

The total value of Thailand's FFV exports was $511.9 million in 2005, up from $300.5 million in 1999, an increase of 69 per cent. Exports of fruit increased by 64 per cent, vegetables by 70 per cent, and nuts surged by 195 per cent although from a very low base. The growth in Thailand's FFV was similar to that of all developing countries (70 per cent), but lower than that of ASEAN as a whole (100 per cent).

Most exports go to regional markets. In 2005, 80.5 per cent of fresh fruit exports went to the markets of China (30.2 per cent), ASEAN (23.5 per cent), Hong Kong (China), Taiwan Province of China and the Republic of Korea (table A.4). With regard to vegetables, these regional markets together absorbed 61.1 per cent of Thai exports, with Japan alone absorbing 43.4 per cent (table A.6). The principal destinations of Thai FFV exports are shown in table 14 and figure 2 below.

Table 14. Thailand: value of FFV exports by principal destination, 2005

Export markets	Value ($ million)	Share in total FFV exports (%)
Japan	101.4	19.8
China	100.6	19.6
EU-15	65.3	12.8
Hong Kong, China	37.7	7.4
Taiwan, Province of China	33.0	6.5
United States	29.7	5.8
Indonesia	27.1	5.3
Myanmar	22.1	4.3
Malaysia	11.6	2.3
Singapore	9.0	1.8
Lao PDR	8.0	1.6
Other ASEAN	8.1	1.6
South Asia	14.2	2.8
Australia	8.0	1.6
Canada	7.9	1.5
Rest of the world	28.2	5.5

Source: COMTRADE.

Thailand's fruit exports constituted 54.7 per cent of its total FFV exports, in value terms, in the period 2003-2005 (table 15). "Minor" tropical fruit accounted for the largest proportion of those exports, with only a relatively small proportion consisting of "major" tropical fruits or off-season fruit – two categories that tend to dominate fruit exports of most developing countries, especially in Africa and Latin America. Vegetable exports, excluding manioc, accounted for 39.3 per cent of Thailand's FFV exports, in value terms. Most of these fall under HS subheadings for "other vegetables", including subheading 070990 ("other vegetables, fresh and chilled"), which also covers fresh baby corn.

Box 5. Thai exports of baby corn, asparagus and mangoes

Baby Corn

Thailand is the world leader in baby corn exports, with a share of about 85 per cent of the world market in the early 2000s. Only a small proportion of baby corn is exported as fresh, chilled and frozen; by far the largest share of exports takes the form of canned baby corn. The United States is a particularly important market.

Upstream activities are dominated by collectors/brokers who provide a range of services to growers and link them with packhouses and manufacturers/exporters. The EurepGAP standard may have some impact on exporters of baby corn to the European markets.

In trade statistics provided by COMTRADE, fresh and chilled baby corn is part of "other vegetables, fresh and chilled" (HS 070990), whereas frozen baby corn is part of frozen sweet corn (HS 071040). More detailed 8-digit EU trade statistics indicate that fresh and chilled baby corn represented around 70 per cent of EU imports (in value terms) of "other vegetables, fresh and chilled" (HS 070990) originating in Thailand in 2006.

Asparagus

Asparagus has emerged as a dynamic product offering small-scale Thai farmers an alternative high-value crop with a relatively high rate of return on investment.

Export revenue of fresh asparagus was approximately $28.1 million in 2005 and represented 14 per cent of Thailand's total vegetable exports. The country was the seventh largest asparagus exporter in 2005 after Peru, Mexico, Spain, the United States, the Netherlands and Greece (COMTRADE). It has a significant market share in regional markets, especially in Japan and Taiwan Province of China, but only a small share (around 3 per cent) in the EU. Whereas Taiwan Province of China is the major market in volume terms, Japan is the number one destination market in value terms, indicating a higher price per unit in the Japanese market.

Mangoes

The value of fresh mango exports has declined, from $5 million in 2001 to $4.5 million in 2004 (Communication from the Department of Export Promotion). Due to problems related to pests (e.g. fruit flies) and high chemical usage (exceeding MRLs), only a small proportion of total mango production can be exported. Out of a production of 403,000 tons, 11,000 tons were from GAP-certified farms, of which 5,785 tons (1.4 per cent of total production) were exported.

According to COMTRADE trade statistics, mangoes are part of HS-96 080450 (comprising guavas, mangoes and mangosteens). They accounted for $23.5 million worth of exports from Thailand in 2005 (table 15). Mangoes are mainly destined for Asian markets, of which Japan is the largest for fresh mangoes. Only a small amount is exported to Europe. The GAP certificate issued by the Department of Agriculture is important for exporters. There is strong potential to increase mango exports if their quality and pesticide usage could be improved.

National experience with the development of quality systems

National GAP

In Thailand, the Department of Agriculture of the Ministry of Agriculture and Co-operatives (MOAC) has set up a national GAP scheme for agricultural production (Q-GAP), and is responsible for control/inspection. Farmers who fulfil the requirements of the national GAP standard can label their products with the Q-logo. National GAP standards have also been developed for livestock and fisheries under the responsibility of the Departments of Livestock and Fisheries respectively.

Table 15. Thailand: exports of FFV, 2003-2005

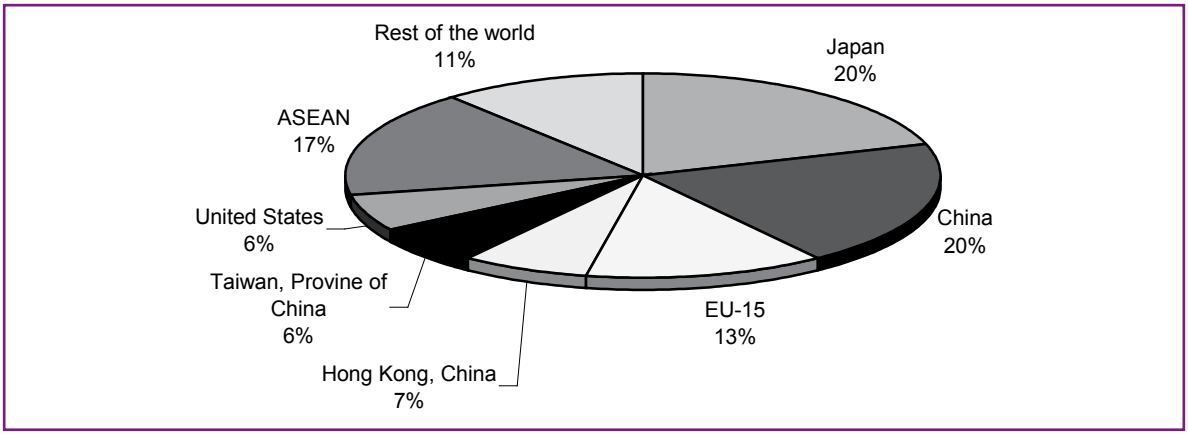
		Value of exports ($ million)				Share in total FFV exports 2003-2005 (%)
		2003	2004	2005	Average 2003-2005	
0701-0713, 08	FFV	383.5	453.9	511.9	449.8	100
0803-0814	Fruit	213.6	236.5	288.5	246.2	54.7
Major tropical fruits		19.7	27.2	33.2	26.6	5.9
080450	Mangoes, mangosteens and guavas	12.0	15.9	23.5	17.1	3.8
0803	Bananas	3.3	8.1	6.1	5.8	1.3
	Pineapples	3.6	2.6	3.2	3.1	0.7
080720	Papayas	0.8	0.6	0.4	0.6	0.1
Other (minor) tropical fruits		188.6	203.2	245.4	212.3	47.2
081090	"Other" fruit, fresh	93.3	122.7	144.0	120.0	26.7
081190,081290 081340	"Other" fruit, frozen, provisionally preserved, dried	95.3	80.5	101.4	92.3	20.5
Other fruit		5.2	6.1	10.0	7.1	1.6
0805	Citrus fruit	3.4	4.5	6.2	4.7	1.0
	Other	1.8	1.6	3.8	2.4	0.5
0801-0802	Nuts	24.9	30.3	24.6	26.6	5.9
080111-19	Coconuts	6.6	7.9	9.6	8.0	1.8
	Other nuts	18.3	22.4	15.0	18.6	4.1
0701-0714	Vegetables	145.0	187.0	198.8	176.9	39.3
070990	"Other" vegetables, fresh	45.3	56.7	61.8	54.6	12.1
071080 071190 071290 071390	"Other" vegetables, frozen, provisionally preserved, dried, mixtures of vegetables	22.8	25.1	25.9	24.6	5.5
070920	Asparagus	15.6	24.5	28.1	22.7	5.1
070820 071331-39 072022	Beans	30.4	33.6	27.7	30.6	6.8
070310	Onions and shallots	4.0	13.1	11.8	9.6	2.1
071040	Sweet corn	1.1	2.8	4.2	2.7	0.6
070951-59 071131-59 071231-39	Mushrooms	1.9	1.7	2.4	2.0	0.4
070320	Garlic	0.2	1.1	2.3	1.2	0.3
	Other	23.7	28.4	34.6	28.9	6.4

Source: COMTRADE.

Under the Thai scheme, farmers who apply for certification are assessed at three levels: (i) production processes for safe products (in particular appropriate use of agrochemicals); (ii) production processes for safe and pest-free products; and (iii) production processes for safe, pest-free and quality products.

The standard contains 8 elements ("principles"): (1) safety of water used, (2) site, (3) use of agro-chemicals, (4) product storage and on-site transportation, (5) data records, (6) pest-free products, (7) quality management, and (8) harvesting and post-harvest handling. For level 1 certification (safe products), only the criteria for the first 5 elements must be met. For level 2 certification (i.e. safe and pest-free products) the pest-free criteria (principle 6) must also be met. For level 3 (i.e. safe, pest-free and quality products), all requirements (principles 1–8) must be met.

Figure 2. Share of main markets in Thailand's FFV exports (in value terms), 2005



Source: based on COMTRADE.

The Ministry of Agriculture and Co-operatives has authorized the National Bureau of Agricultural Commodity and Food Standards (NBACFS),[58] the national regulatory body for food safety established in 2002, to act as an accreditation body to assess the competence of public and private organizations responsible for inspection and certification of agricultural commodity and food production that comply with national GAP standards (see section below on certification and accreditation issues).

In 2005, the NBACFS established criteria for the GAP production process and its product certification (ACFS 9005-2548) as follows:

- The primary production process at farm level has to comply with the national standard for GAP and should be inspected and certified by authorized certification bodies;
- The production process, including packhouse facilities, has to conform to hazard analysis and critical control point (HACCP) requirements and be certified by authorized certification bodies;
- Operators who are allowed to use the Q mark must observe procedures for taking back products, if necessary, and for complying with traceability requirements;
- Products using the Q mark will have been tested for their essential quality and analysed for toxic, contaminating or other dangerous residues; and
- For products not yet included in the list of Agricultural Commodity and Food Standards, other international standards may be used upon the approval of the National Committee on Agricultural Commodity and Food Standards.

The GAP scheme originally covered 29 crops, of which 12 are main export crops.

Ambitious targets were set for registration and certification. Registration of 325,000 farms, with at least 145,000 farms certified, was to be achieved between 2004 and 2008. As of July 2005, 432,851 farms had registered for GAP certification, 259,885 had been inspected and 140,351 farms with an area of 200,000 ha had obtained "Q GAP" certification for 31 fruit and vegetable crops (Suvanjinda, Surisingh and Somsri, 2005). Some have argued that the objective to certify a very large number of farms has put considerable stress on inspection and auditing activities of the Department of Agriculture, and has affected the quality of GAP certification. Most farms have been certified at "level 1" (production processes for safe products).

GAP certification indicates, among other things, that agrochemicals are properly recorded and used. The GAP standard requires that instructions on labels and/or instructions/recommendations of the Department of Agriculture must be followed. Banned chemicals must not be used, and for export-oriented production, only chemicals allowed by trading partners may be used. The records of

[58] The NBACFS works under the direction of the National Committee on Agricultural Commodity and Food Standards and also serves as its secretariat. The main mandates of the NBACFS are to: (a) develop standards for primary and processed agricultural commodities and food products, including GAP and organic products, and (b) accredit certification bodies responsible for inspection and certification of agricultural and food products.

agrochemical usage must be checked and, in case of doubt, samples collected for residue analysis. GAP certification makes it easier for growers/exporters to meet the Department of Agriculture's requirements for FFV exports. In some cases, the Department of Agriculture requires that additional chemical and pest control regulations be met.

Farmers who fulfil the GAP requirements can label their products with the GAP logo. Thailand has only one GAP logo, the Q quality mark, which is a third-party certification system owned by the Ministry of Agriculture and Cooperatives. It indicates that a product is of high quality and safe for consumers, and that its production process and post-harvest activities (e.g. packhouses), the latter based on the Q Good Manufacturing Practice programme, are in accordance with the requirements of national or equivalent GAP protocols.[59]

"Q" GAP (for farms) is part of a supply chain scheme and is supported by other "Q" certifications including "Q" Shop (for shops selling quality agricultural inputs such as pesticides), "Q" GMP (for packhouses), "Q" HACCP (for processing establishments), "Q" Fumigation (for sulphur dioxide), "Q" supermarkets and 'Q" Food safety (which can be granted to a packhouse or processing establishment with their own relevant Q certification and using inputs from contract growers with Q GAP certification, provided that their products are found to have conformed with food safety requirements for three months).

Benefits

Several potential benefits can be attributed to the national GAP scheme. A key added value is the strong incentive to farmers to effectively implement mandatory food safety requirements that are otherwise poorly enforced. GAP schemes may also bring benefits to stakeholders along the supply chain (i.e. growers, collectors/brokers, wholesalers, retailers, exporters and consumers).

Currently, chemical contamination is the major focus of the national GAP programme, which reflects the importance of this factor in assuring food safety, both for the national market and for export. Microbial, parasitic and physical contamination, as well as environmental requirements are not yet addressed, but are likely to receive more attention in the future development of the Q-GAP system.

Exporters are the most likely to benefit as their enhanced ability to meet the requirements of external markets (i.e. pesticide regulations) will help them access those markets and thus increase trade volumes. To the extent that the national GAP scheme is accepted in international markets, in the long run they may also benefit from reduced costs by avoiding the need for multiple certification.

Obstacles

At the level of growers, the following are among the major challenges to effective implementation of the national GAP programme:

- *Insufficient awareness about safety, environmental and social impacts of agricultural practices*;
- *Lack of knowledge and low levels of education:* Most growers lack an understanding of why GAP is needed and find it difficult to implement (e.g. with regard to record keeping). Many resist changing their farming practices. Some workers also lack knowledge about agrochemicals, and often use them improperly (i.e. the wrong ones or the wrong dosage);
- *Poor understanding of GAP requirements:* Due to lack of knowledge and insufficient information about the GAP programme, many growers and farm workers have problems understanding GAP requirements, which may result in ineffective GAP implementation;
- *Poor record keeping:* Problems with record keeping (e.g. on farm processes and chemical usage) may cause failures in the tracking system;

[59] Products that carry the Q mark also display a code to assure consumers that products placed on the market can be traced back to the farm.

- *Low motivation/incentives to implement GAP:* Since GAP implementation normally does not lead to price premiums, yet requires significant initial and recurrent investment, there tends to be a lack of motivation to implement GAP;
- *Unhygienic practices in production and food processing:* One of the key challenges of GAP in fruit and vegetable production is to overcome problems related to the contamination of food from unhygienic practices in both pre- and post-harvest activities;
- *No direct links with markets:* Under traditional marketing channels, many growers do not have direct links with markets, and are not directly exposed to the exigencies of customers concerning food safety. As a result, their farm practices may not strictly conform to GAP requirements;
- *Small number of large export companies:* The number of large producers/exporters that comply with EurepGAP standards and can play a key role in the effective implementation of national GAP programmes (e.g. through their networking with growers) is still small;
- *Insufficient organization of smallgrowers in producer associations:* There are only a small number of groups of growers that facilitate the effective implementation of GAP by smallgrowers;
- *Subsidization of pesticides:* The tax structure related to pesticides encourages more use of chemicals than other inputs. Since 1991, pesticides have been exempted from import duty, business and municipal taxes; and
- *Shortage of skilled labour:* The shortage of skilled labour is becoming a problem as people migrate from rural areas, thus prompting resort to certain labour-saving practices such as increased consumption of herbicides (Somsri, 2005).

At the level of government agencies, the main challenges are:

- *Lack of clarity concerning GAP:* There is poor understanding of the role of the national GAP as a means of effectively achieving national food safety, and of the role and coexistence of supplementary "premium" GAPs in facilitating access to export markets. Related to this are issues concerning the concept and sequencing of the national GAP;
- *Insufficient dialogue with stakeholders:* The current national GAP system has been designed and implemented by the Government. At the same time, a regional cluster of GAP programmes in the western part of Thailand (known as the "Western GAP cluster") exists that was developed using a bottom-up approach. A more intensive stakeholder dialogue is required concerning the coexistence of the two schemes, the implications for the further design of GAP schemes and their possible benchmarking to EurepGAP;
- *Insufficient outreach:* Failure to inform and explain the GAP programme to growers may result in its ineffective implementation owing to their lack of understanding of its objectives and concepts; and
- *Lack of coordination in training:* Several government institutions (e.g. Department of Agriculture and the Department of Export Promotion) as well as universities offer training in GAP, but this is insufficient. The different training programmes may not only create confusion among producers, but also fail to create national awareness.

At the level of the national FFV market:

- Supermarkets operating in Thailand, such as TOPS, MAKRO, Carrefour and Tesco-Lotus are gradually introducing supply chain management for the national market, and thus tend to give greater importance to the application of GAP schemes. Tesco-Lotus, for instance, has just launched a simplified EurepGAP protocol for its national suppliers that the company intends to gradually expand over the next five years to pull its suppliers up to the EurepGAP standard (Wipplinger, Phongsathorn, and Watanakeeree, 2006:20; Boselie and van de Kop, 2007).

Smallholders

The policy of the Thai Government is to promote the production of safe and good quality food, including fruit and vegetables, and to increase the competitiveness of Thai products in international markets. GAP recognizes that food production at the farm level and by smallholders should be safe, and that outgrowers play a key role in GAP implementation. Participation in the programme is voluntary. Smallholders and outgrowers must register to become members and to be eligible for GAP training for specific crops conducted by the Department of Agriculture. They must implement the GAP code on their farms, follow the guidance provided by crop-specific protocols and ensure that their farm practices meet GAP requirements. GAP implementation tends to be more effective among growers who produce for export markets.

Working groups from the Department of Agricultural Extension have been conducting an assessment of production areas to identify the main products in each area and the risks associated with improper farming practices. The growers and the community are involved in this project by providing the necessary information. These activities create baseline information on critical points that should be addressed in the development of a national GAP. Growers are involved in the discussions on GAP arranged by the Department of Agriculture. Some growers have participated in GAP workshops and seminars organized by international organizations such as the FAO, in coordination with the Government. Some networks of smallholders and outgrowers of some crops, such as asparagus, baby corn, okra and chilli, are members of the working group on GAP clusters, for example in western Thailand.

The private sector is also involved in terms of supporting smallholders and outgrowers with financial services and providing some advice. However, it is limited in its ability to transfer knowledge due to insufficient manpower. Most small producers have limited financial resources, insufficient knowledge of agricultural practices and production planning, and no direct access to the market. They therefore have to rely on large producers, exporters or national supermarkets for assistance in understanding and implementing GAP. As a result, they become dependent on those buyers.

There is a need to promote cooperation among growers, for example through the creation of producer groups. These groups can monitor the farming practices and product quality of their members. Strong grower groups that can effectively implement GAP could increase their bargaining power vis-à-vis manufacturers and exporters for increasing the farm-gate prices of their products.

The proper functioning of groups of asparagus producers managed by packhouses and manufacturing exporters in the western region is one example of the mutual benefits that can be gained by all those involved. On the one hand, growers benefit from guaranteed high prices all year round, and on the other, manufacturing exporters are assured of high quality and safe produce with guaranteed supplies. Well-functioning groups can maintain their competitive advantage by ensuring continuous GAP compliance.

Another example is the creation of informal farmers' associations with the assistance of the TOPS supermarket chain. In these associations, professional growers within a family or village join forces and exchange experiences and farming knowledge. These groups seem to meet the preconditions for developing into fully-fledged growers' associations and may enjoy long-standing direct business relationships with retailers (Boselie and van de Kop, 2007).

Experience with GAP, in particular EurepGAP implementation for some crops, such as asparagus and baby corn, appears to indicate that smallholders and outgrowers face difficulties in meeting some requirements. Post-harvest sanitation, for example, is difficult to control. The lack of good sanitation for post-harvest handling can lead to physical contamination, such as contamination from soil if harvested crops are laid on the ground instead of being placed in clean storage areas. Calibration of agricultural equipment is also a problem, especially the nozzle of the sprayer, which is difficult to

control. Some of these difficulties can be resolved by periodic training, self-monitoring and internal audit among group members.

Factors to be considered in a national GAP

The main national conditions that the Government has been seeking to address in the development of a national GAP are: (a) the lack of a system for tracking of agrochemical use, and (b) the high use of agrochemicals. With regard to the first factor, even when legally imported agrochemical agents are registered at the time of import, there is no further record of their distribution to local shops around the country. Concerning the second factor, high chemical use on some crops reduces the competitiveness of their exports. For example, the Department of Agriculture reports[60] that with regard to mangoes, out of 2,310 samples taken in 2004, 10.7 per cent had residues that were over the MRL limits. As a result, Thai mangoes imported into Japan are quarantined and strictly inspected for residues.

Table 16 illustrates how national factors and development priorities could be woven into a national GAP.

Table 16. Incorporating national factors and development priorities into a national GAP

National factors	Development priorities	How can these development priorities be woven into a national GAP?
Lack of tracking of agrochemical usage	Expand the scope of the GAP to cover not only chemical contamination but also biological and physical contamination	Address the concerns about several kinds of contamination (biological, chemical and physical contamination) related to food safety issues.
High agrochemical usage	Introduce quality management systems, "from farm to table"	*At the farm level:* Follow the advice contained in crop-specific protocols, and produce crops in accordance with relevant regulations and best practices. *At other levels*: Emphasize hygienic practices to prevent or minimize risks of contamination
	Enhance existing inspection and certification systems	*Inspection:* Train inspectors; increase the number of laboratories to provide faster services, or outsource some laboratory functions to the private sector. *Certification*: Empower the Office of Agricultural Research and Development in each region to approve certification. Outsource certification functions to the private sector.
	Develop and improve manpower capabilities	*Stakeholders: Growers* Explain concepts and methods of how to implement GAP, and provide training in hygienic practices and food safety. *Stakeholders: Others* Explain food safety, and how GAP helps create food safety and hygienic practices. Provide information and training to government staff, advisers, inspectors and auditors.

There should be a gradual approach to the adoption and implementation of a national GAP standard. Initially, there will be a coexistence or multi-tier system of GAP schemes in the country that can respond to the environmental, health and food safety requirements of the export markets (both in Asia and in Europe) and the national market in a flexible way, and in accordance with existing national capacities. Second, the national GAP programme run by the Department of Agriculture will provide the general GAP reference and a starting point for building a programme that eventually goes beyond safe agrochemical use to cover other areas as well over time. Other GAP schemes, either at regional or group level, will form premium GAPs that strive to approach or be equivalent to EurepGAP. Direct EurepGAP certification of individual large producers is always an option. Third, to avoid

[60] Data taken from www.doa.go.th/onestop/in.html.

confusion (notably among producers, consumers and traders at the national level) all these multi-tier systems should be linked/interfaced in an appropriate way, using the Department of Agriculture's GAP programme as a benchmark.

The Government could involve other institutions such as universities, research centres and the private sector in the coceptualization and building of a coherent approach on GAP. For example, the Western GAP Cluster is a success story of close cooperation among several parties to promote GAP. The cluster was developed by the Kenan Institute in cooperation with Kasetsart University, Kampangsaen Campus, and stakeholders in the supply chain, such as growers, grower groups, chemical suppliers and exporters, as well as representatives from the National Economic and Social Development Board (NESDB) and the National Bureau of Agricultural Commodity and Food Standards. The cluster aims to produce good quality and "safe" vegetables for both export and domestic markets and increase the competitiveness of the products. It has succeeded in improving GAP and building a high level of commitment among growers for continuous improvement of farming practices.

Role of the Government

For developing and implementing a national GAP, the Government needs to consider the following key issues:

- Formulating and implementing policies, such as those relating to improving food quality and safety, in order to meet customers' requirements and increase the competitiveness of agricultural products exported from Thailand;
- Designing the national GAP system in a way that it meets domestic and international buyers' requirements;
- Providing a framework and guidelines for the further development of the national GAP scheme;
- Clarifying the role and responsibilities of each government agency;
- Clarifying the role of the private sector, for example in relation to laboratories, third-party certification, consultants, training, research and food producer associations;
- Fostering dialogue with all stakeholders;
- Identifying potential parties and defining their responsibilities for implementation of GAP;
- Setting up a monitoring system and formulating a follow-up plan; and
- A recent UNCTAD-ITD (International Institute for Trade and Development) workshop on WTO Agreements and EU Requirements on SPS, TBT and environmental issues: Challenges and Opportunities for Thailand's Agribusiness recommended the creation of a small multi-stakeholder steering group for further clarifying key conceptual and implementation issues of the multi-tier GAP system.[61]

Comparison of Thailand's national GAP programme with EurepGAP

Many requirements of the Department of Agriculture's GAP programme are quite similar to those of EurepGAP. However, a comparison of the two standards shows that there are some important differences between the two standards, such as legal ownership, the certification process, issues covered and the level of detail of the requirements. The EurepGAP standard is a private sector initiative by leading retail groups, whereas the Thai Department of Agriculture's GAP programme was established by government agencies that are the legal owners.

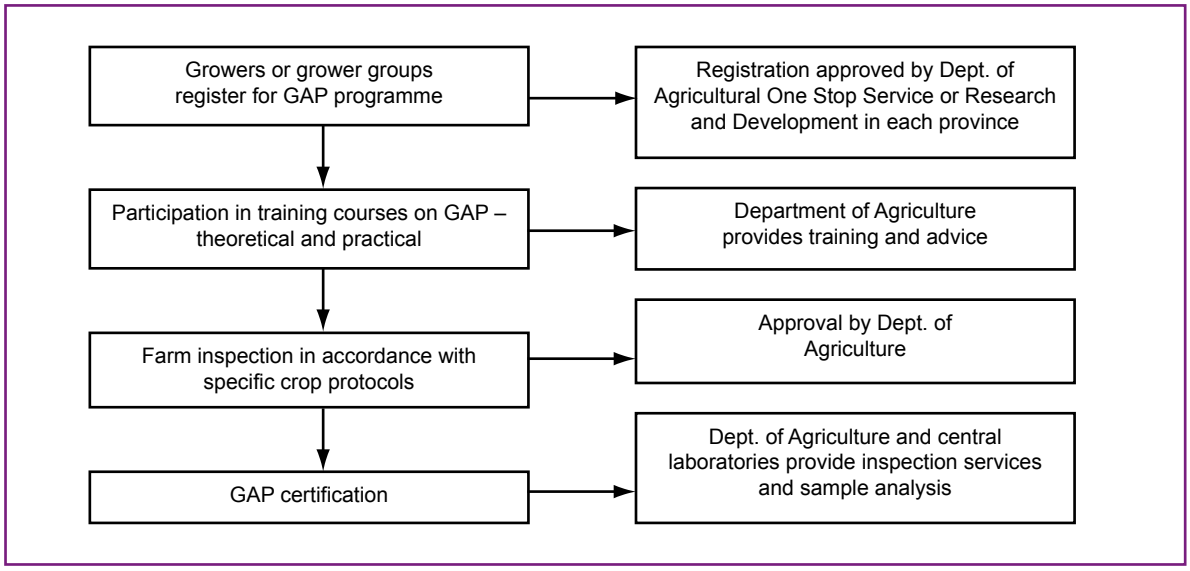
Figures 3, 4 and 5 below show the procedures followed in the certification processes of the Thai national GAP standard and EurepGAP group certification respectively.

The EurepGAP certification process is based on a larger number of control points and compliance criteria and is more complex than the national GAP scheme.

[61] For further information, see: www.unctad.org/trade_env/meetingsALL.asp.

Currently, the entire certification process is carried out by the Government, which involves setting the standards and serving as a national regulatory body (National Bureau of Agricultural Commodity and Food Standards), providing advisory services and farm inspection, and, finally, issuing the certification (Department of Agriculture). As a result, it takes a long time to get the certification. Moreover, such an approach causes doubts as to the independence and credibility of the system and the certification. Further, at present, the private sector and stakeholders are playing only a limited role and have not been much involved in the development of the national GAP scheme.

Figure 3: Flowchart of Thailand's national GAP certification process



Source: Dept. of Agriculture, One Stop Service (OSS).

Although both individual growers and grower groups can be certified, as indicated in figure 3, at the time of writing, no grower groups had been certified. However, there have been discussions on group certification.

Figure 4: Thailand's national GAP scheme: flowchart of inspection and certification system

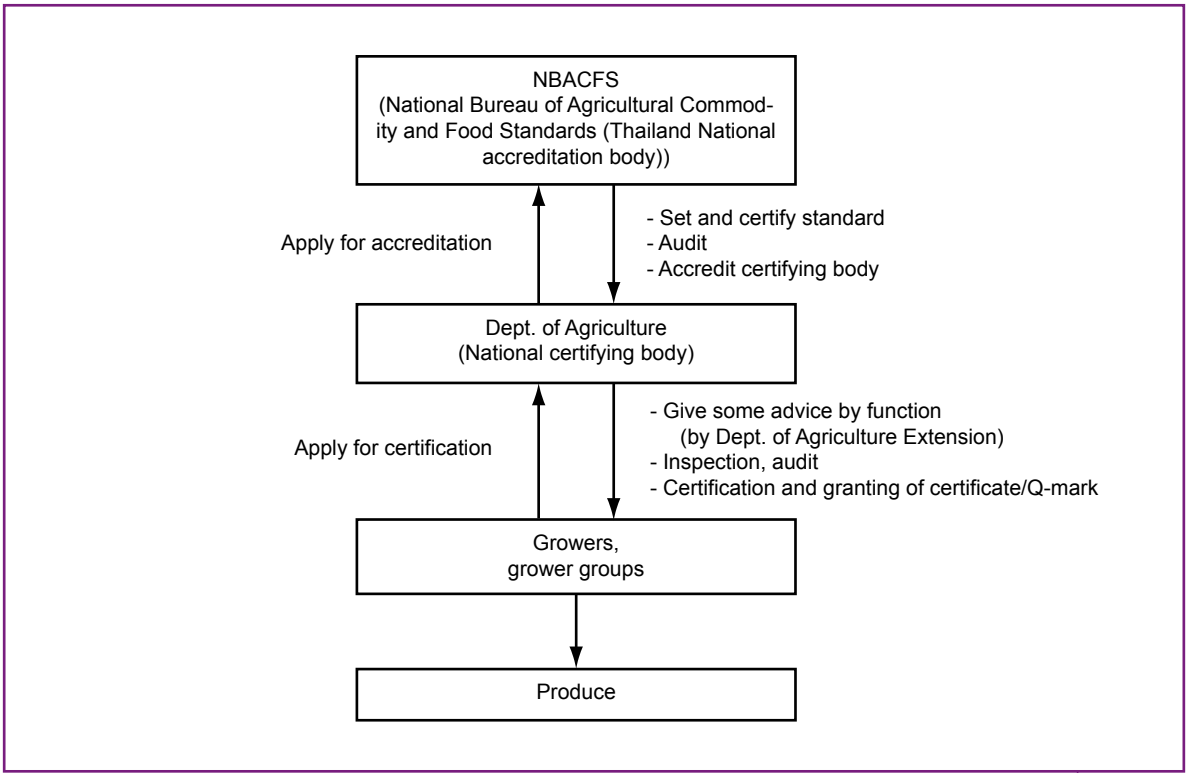
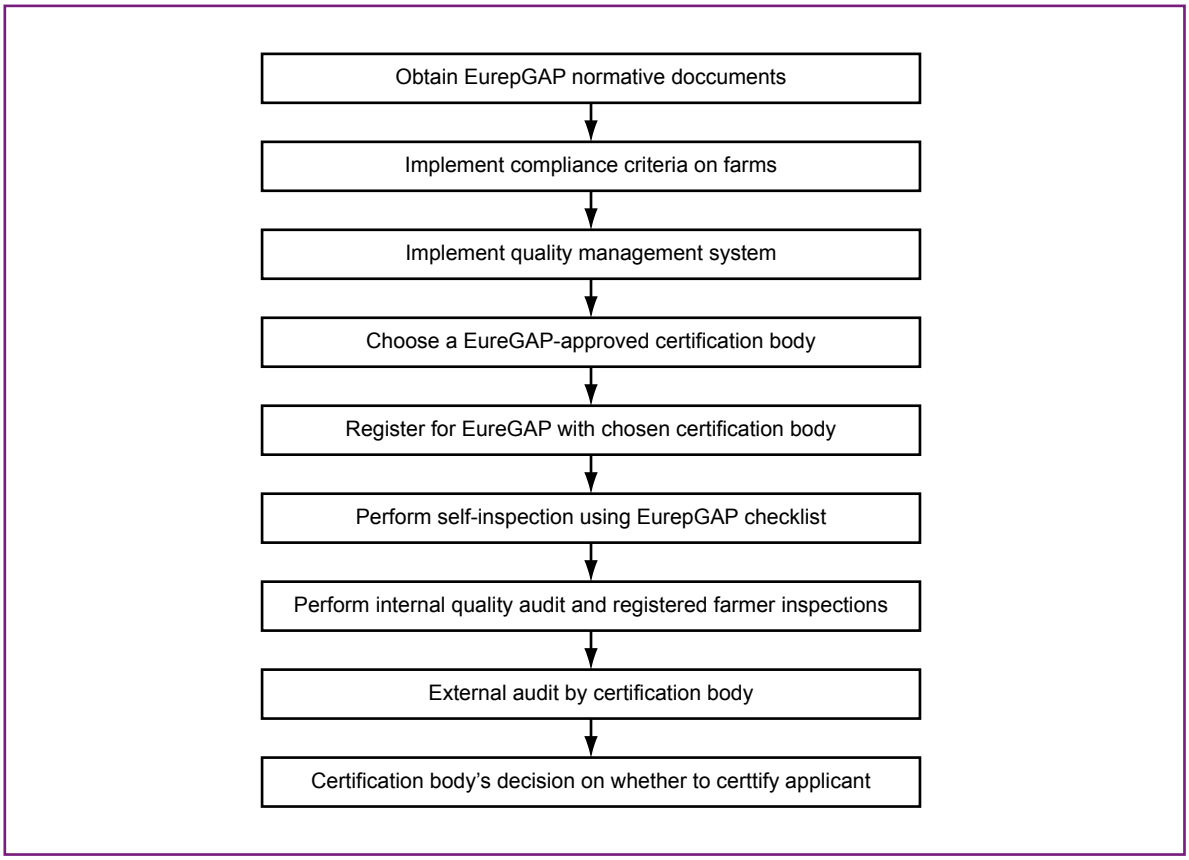


Figure 5. Flowchart of EurepGAP group certification process



There are also differences on a number of issues, as shown in table 17 below.

Cost of certification

The Thai Government and its institutions provide free services, such as training, inspection and certification, to assist farmers in complying with the national GAP standard and obtaining certification.

Table 17. EurepGAP versus Thailand's Q-GAP

Issue	National Q-GAP	EurepGAP
Generic versus specific criteria	ACFS has established general GAP control points and compliance criteria for foods, which cover fruit, vegetables, herbs, grains and other food products. In addition, the Dept. of Agriculture has established specific criteria for each crop, to be used together with the general standard. These criteria constitute a kind of guideline for GAP and a manual for growers, indicating which chemical agents are allowed or not.	Has generic control points and compliance criteria for all fruit and vegetables.
Documentation	Places little emphasis on documentation. Some records have to be kept, but these are not as detailed as those of EurepGAP. Consequently, an effective tracking system is still lacking.	Emphasizes record keeping and documentation. A large number of documents need to be filled in. This should provide an effective tracking system.
Inspection and audit	Inspection and auditing must be done by government officials and are free of charge.	Inspection and auditing must be done by third-party bodies, most of which are private agencies. These services are charged and can be very expensive.
Workers' welfare and environmental issues	Does not have control points on these issues. Requirements in these areas depend on labour, public health and environmental laws.	Has control points for both issues.

However, since Thailand's national GAP standard has only limited international recognition, exporters that target markets outside Asia, which require conformity to EurepGAP or similar standards, have to obtain certification against these standards. Certification costs may be high. For example, the total cost of EurepGAP certification for a plantation area of around 150 ha (owned by around 100-150 growers) is estimated at one million baht (about $25,000), half of which relates to first-time certification and the other half to farm management and other overhead costs. The cost for certification against other standards, such as the British Retail consortium (BRC), is around $7,500–$8,000 (certification cost only). However, BRC certification by a locally based certifying body costs around $2,500 (packhouse audit).

For EurepGAP certification, certification bodies with branches in Thailand are: BCS Thailand, South-East Asia, P&H Agro Control Co (Control Union Thailand, Skal), and SGS Thailand (EurepGAP website).

With regard to other standards, such as Tesco's Nature's Choice, exporters interested in obtaining certification must invite foreign certifying bodies to Thailand for inspection. Due to the small number of internationally operating certification bodies specialized in these standards, costs tend to be high. For example, for Tesco's Nature's Choice certification, the inspection has to be done directly by certification bodies based in the United Kingdom.

GAP training

GAP training and advisory services for individual growers and grower groups are supposed to be provided by the Department of Agricultural Extension (under a memorandum of understanding with the Department of Agriculture signed in 2007). However, since the staff of the Department of Agricultural Extension are insufficiently trained on GAP, this responsibility is often transferred to the Department of Agriculture.

The Department of Agriculture needs to provide internal training to its staff to prepare them to work as GAP advisers and inspectors. They should understand the concepts of a quality management system, as well as quality and GAP issues specific to each crop, while inspectors need to be trained in risk assessment. To this end basic curricula should be developed for them as well as for independent advisers and inspectors.

Appropriate regulations and procedures should complement GAP training. In particular there is a need to:

- Outsource advisory and inspection services to independent government agencies or non-governmental entities, including those in the private sector;
- Establish standards for advisers and inspectors;
- Set up a monitoring system for private/independent advisers and inspectors;
- Establish common inspection checklists;
- Prepare and implement annual work plans for inspection; and
- Coordinate food inspection activities across ministries.

With regard to EurepGAP, 13 persons were trained as EurepGAP trainers under the sponsorship of the United States Agency for International Development (USAID). However, none of these trainers are registered with FoodPlus GmbH, the EurepGAP secretariat (Wipplinger, Phongsathorn and Watanakeeree, 2006:17). More recently, there have been two EurepGAP Train-the-Trainer Workshops in which, eight persons completed the course and received the EurepGAP Train-the-Trainer Certificate.

Recommendations

The following recommendations are made:

- Create and maintain a regular dialogue between the key public and private stakeholders on the main conceptual issues, and the coexistence of and interplay between the various GAP

initiatives. In this context, also examine successful cases of collaboration between the public and private sectors in the development of national GAPs in other countries;

- Envisage a larger role for the private sector. The Government should play the role of a regulatory body, setting regulations and codes of practice and establishing effective monitoring systems. However, the Government should outsource the provision of advisory services on GAP, farm inspection services and certification to the private sector. This will make the certification process faster, more effective and credible;
- Bring the national GAP scheme gradually in line with international buyers' requirements. Currently, chemical contamination seems to be the major focus in the national GAP. It should be extended gradually to cover two additional components relating to biological and physical contamination. Environmental protection and workers' welfare issues should also be incorporated in the national GAP;
- Promote public-private partnerships (PPP) with an international partner to help small producers implement GAP. More public and private sector support needs to be provided to establish and consolidate stable and efficient producer groups, including at the village level, as well as provide assistance in reducing costs of small producers of record keeping, testing and certification. Also, for the national market, the Government could assist in creating and further promoting mutually beneficial partnerships between supermarkets and small producers;
- Assist producers, particularly smallgrowers, in obtaining EurepGAP certification by strengthening the local certification structure. The public sector can finance part of the certification costs to enable small producers to implement EurepGAP; and
- There is room for regional cooperation (with Malaysia, but also with other neighbouring countries) for improving quality management infrastructure, especially inspection and testing facilities, which could lead to cost-sharing and facilitation of regional trade.

With regard to the development and implementation of national GAP standards in Thailand (and other interested ASEAN member States), in general a two-step approach is proposed. The first step should aim at developing a government-sponsored national GAP system to ensure national food safety. Efforts should also be made to gain full recognition of the national GAP systems by some of the key Asian export markets, such as Japan and China. This could facilitate access to those markets in the short run. The second step should aim at national or regional systems, which could be developed to facilitate international market access. This could be done by benchmarking to a higher standard that is more widely accepted, such as EurepGAP. This approach will lead to the coexistence of several GAP tracks for some time to come. The different GAP types would need to be interfaced to avoid confusion among producers, traders and consumers.

Annex: List of people interviewed for the Thai country case study

Mr Nikorn Bandit
Sweet corn collector

Mr Adul Sitthiwongse
Office of Royal Project

Mrs Prisna Hanwiriyapan
Office of Agricultural Research and Development Area 1

Mr Somboon Janbunmee
Technical One Stop Service, Department of Agriculture

Mr Soonthorn Sritawee
River Kwai International Food Industry Co., Ltd.

Mr Trinead Rodpothong
Asparagus Farmer Group/Community

Paichayon Uathaveekul
Swift Co., Ltd.

Dr Chuanpit Arunrangsitkul
GAP Western Cluster, Kasetsart University Kamphaeng Saen Campus

Dr Roongnapa Kurpraditskul
Environmental Science Laboratory, Rad Instititute, Kasetsart University Kamphaeng Saen Campus

Ms Junnipa Srichaiwan
National Bureau of Agricultural Commodity and Food Standards

Ms Suttinee Intarakamhaeng
National Bureau of Agricultural Commodity and Food Standards

Ms Wantana Buasup
Bureau of Agricultural Commodities Promotion and Management Development, Department of Agricultural Extension

Mr Kieattisak Tangcharoen
Chareon Peerawat Farm

Mr Sayan Boonying
Head of mango grower group, Pichit Province

Mr Silpchai Tagoontip
Head of mango grower group, Pitsanulok Province

VI. NATIONAL EXPERIENCES: VIET NAM[62]

Introduction

The fruit and vegetable sector plays a major role in the economic and social development of Viet Nam. A large percentage of rural households make a living from small-scale fruit and vegetable farming. According to FAO estimates, the production of fruit and vegetables in Viet Nam reached 13.3 million tons in 2004, up from 5 million tons in 1979-1981 (table A.1).

Exports of FFV have been increasing in recent years, helped by the fact that the quantity of vegetables produced has been sufficient to meet domestic demand,[63] and by the rapid increase in exports of nuts (especially cashew nuts), which constitute 65–75 per cent of Viet Nam's total FFV exports. Export earnings from nuts alone amounted to $285 million in 2003 compared to $153.8 million for other FFV. The largest and most dynamic markets for Viet Nam's nut exports are the United States, the EU and Australia. However, regional Asian markets are the main destinations for its other FFV exports. The share of FFV in total agricultural exports (around 8.2 per cent in 2003) and in total exports (around 1.9 per cent) is the highest among the three countries analysed here (chapter II, table 3). Import data of the major trading partners show that Viet Nam's share in world trade in fruit (other than nuts) and vegetables has also increased rapidly in recent years (table A.8).

Yet FFV exports have been facing considerable constraints such as inconsistent quality and quantity, lack of good varieties, poor post-harvest technology and weak supply chain management. Indeed, between 2001 and 2003, exports of fruit, in particular items classified as "other fruit" (SITC 057.98 and 057.99, which cover items such as dragon fruit) declined dramatically, from $255.6 million in 2001 to only $51.6 million in 2003, largely due to a reduction in exports to China. These have since recovered and new markets for fruit exports have been identified, in particular the EU, Hong Kong (China), Taiwan Province of China and ASEAN.[64] Exports of all FFV categories (i.e. fruit, vegetables and nuts) have increased very significantly in recent years.

The Ministry of Agriculture and Rural Development (MARD) expects to increase Viet Nam's annual export earnings to $690 million for vegetables and $350 million for fruit by 2010. This will necessitate consolidation of its FFV exports to traditional markets (such as China) as well as strengthening its position in regional markets with high potential (such as Cambodia and the Lao People's Democratic Republic) and in high-income markets (such as the EU, Japan and the United States). To achieve this, producers and exporters will need to comply with the requirements of export markets – both mandatory government regulations and voluntary private sector standards. For exporters targeting regional markets, meeting public sector SPS measures, such as regulations concerning the use of agrochemicals and MRLs, is a major challenge. On the other hand for exporting to the European markets, they will increasingly be required to conform to private sector standards, such as EurepGAP. FFV exports to the EU still account for a relatively small proportion of Viet Nam's total FFV exports, but this share is expected to increase rapidly; indeed, the EU is already a significant market for specific FFV products from Viet Nam.

Good agricultural practices can play an important role in addressing national food safety and workers' health and safety concerns, as well as in promoting the efficient production of safe food that complies with regulatory and voluntary private sector requirements in export markets. This chapter analyses several initiatives, such as the "safe vegetable" programme and a number of GAP initiatives. Two examples of GAP programmes in South Viet Nam (both focusing on dragon fruit) are analysed: the Ho Chi Minh City (HCMC) GAP programme and the Tien Giang GAP programme. Government

[62] Phan Thi Giac Tam (team leader), Le Thanh Loan, Trinh Thuc Hien, Hoang Thi Thuy, Nong Lam University, Ho Chi Minh City.

[63] However, from May to September production is insufficient, which means that vegetables have to be imported, largely from China.

[64] Over the period 1997–2005, the share of Viet Nam in world trade in all FFV categories (i.e. fruit, nuts and vegetables) continuously increased (table A.8). Whereas China was still the most important market for Vietnamese fruit exports in 2005 (over 50 per cent in value terms), the value of Chinese imports from Viet Nam was still below the level reached in 2002–2003. Consequently, the share of Viet Nam in world fruit trade in 2005 was still below that of 2002–2003, but it is has been increasing.

authorities played an essential role in the first programme, while in the second, the Vietnam Fruit Association (Vinafruit), an association of fruit producers, played an important facilitating role. This could indicate a gradual move from the Government's traditional, top-down approach to one that is more participatory, with an increasing involvement of associations and farmers' organizations. Nevertheless, experience shows that implementation of EurepGAP at the farmer's level needs the involvement and support of the relevant government institutions and local authorities from the outset.

The chapter also analyses Viet Nam's experience in promoting GAP implementation, focusing on issues such as the role of the Government, the private sector and other stakeholders, as well as elements of Viet Nam's legal framework that are relevant for GAP implementation. It further presents a case study on the implementation of EurepGAP in South Viet Nam for dragon fruit production and export. Finally it makes recommendations for action by the Government and the private sector.

Production and trade patterns of FFV and the role of EurepGAP

Production and trade patterns of FFV

The growth in production of FFV in Viet Nam is the combined result of an increase in production areas and productivity. The production area grew from 1 million ha in 2000 to 1.3 million ha in 2003. It represented 10 per cent of the total land under cultivation in 2003 (5.6 per cent for fruit and 4.4 per cent for vegetables), up from 8.1 per cent in 2000. Since 2001, the area devoted to fruit production has been larger than that for vegetable cultivation (table 18 and figure 6).

Table 18. Viet Nam: production areas for fruit and vegetables, 1991-2003

	1991	1995	2000	2001	2002	2003
	Production area (thousand ha)					
Total area under cultivation	9 410.0	10 496.9	12 644.3	12 507.0	12 831.4	12 983.3
Fruit	271.9	346.4	565.0	609.6	677.5	724.5
Vegetables	346.0	377.0	452.9	514.6	560.6	577.8
Fruit and vegetables	617.9	723.4	1 017.9	1124.2	1238.1	1302.3
	As a share of total cultivated area (%)					
Fruit	2.9	3.3	4.5	4.9	5.3	5.6
Vegetables	3.7	3.6	3.6	4.1	4.4	4.5
Fruit and vegetables	6.6	6.9	8.1	9.0	9.6	10.0

Source: Information provided by the General Statistics Office of Viet Nam.

Unlike staple produce, fruit and vegetable productivity has significantly improved in recent years, at an annual growth rate of 8.9 per cent during the period 1998–2003 for vegetables, and 11.66 per cent for fruit between 2000 and 2003 (Hung, 2005:10–13).

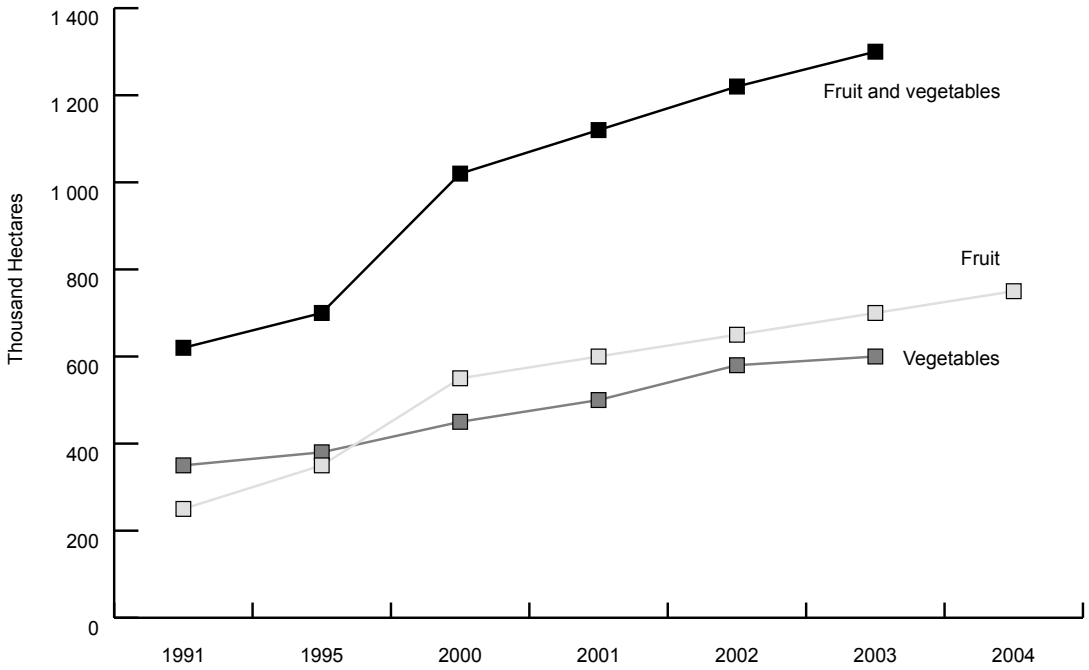
With regard to trade, the definition of FFV has significant implications for both the size and regional trade pattern of FFV exports (particularly as many studies seem to exclude nuts). According to export data reported by Viet Nam to COMTRADE, exports of fruit and vegetables in 2003 can be broken down as shown in table 19 below:

Table 19. Viet Nam: export earnings from fruit and vegetables, 2003 ($ million)

1	Fresh fruit, excluding nuts	57.5
2	Nuts	285.0
3	Vegetables, excluding manioc	41.2
4	Manioc	55.1
5	Processed fruit and vegetables	17.6
1-3	FFV (fruit, nuts and vegetables)	383.7
1-5	Total fruit and vegetables	456.4
1-4	Fresh fruit and vegetables, including manioc and nuts	438.8
1+3+4	Fresh fruit and vegetables, including manioc, but excluding nuts	153.8

Source: COMTRADE.

Figure 6. Area under fruit and vegetable production, 1991-2004



Source: Information provided by the General Statistics Office of Viet Nam.

Prior to 1995 (the year when Viet Nam joined the ASEAN Free Trade Area), Viet Nam's fruit and vegetable exports were not very significant, and were mainly exported to the Russian Federation and other former socialist countries in Eastern Europe. Thereafter, FFV exports (excluding nuts, but including manioc) increased, particularly to China, to reach $360 million in 2001. During the period 2001-2003, FFV exports (by value) fell drastically, mainly due to a decline in fruit exports to the principal market, China, but they have recovered since 2004, expanding to several markets. China has been the principal market for Viet Nam's FFV exports, whether or not nuts are included (table 20). However, beyond China, the pattern of exports depends very much on whether or not nuts are included in the FFV definition (see also figures 7 and 8).

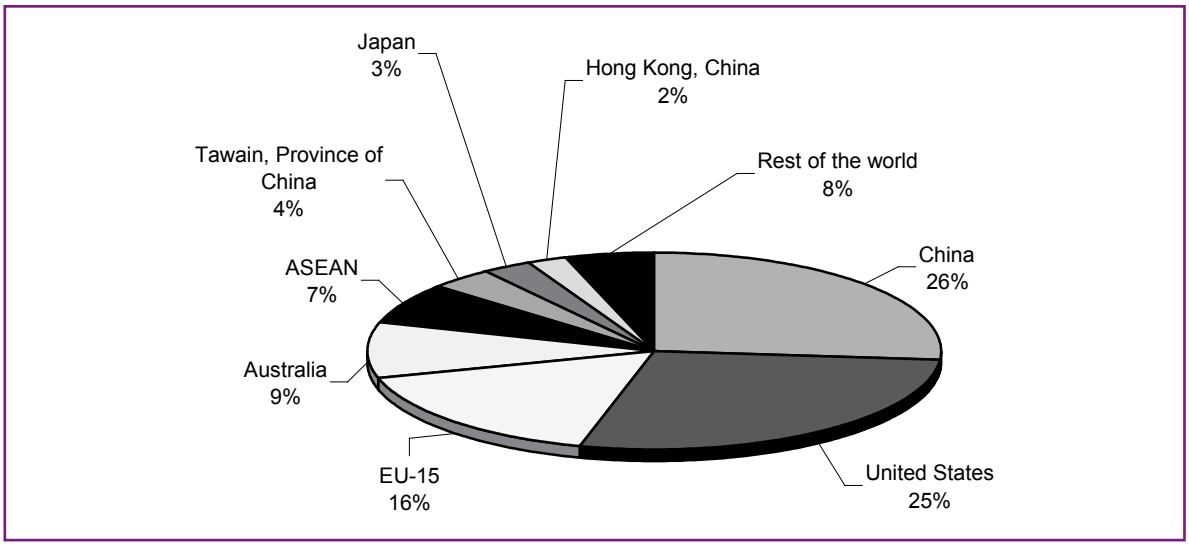
Table 20. Viet Nam: main destinations of FFV exports, 2003*

FFV			FFV, excluding nuts		
Destination	**Value ($ million)**	**Share (%)**	**Destination**	**Value ($ million)**	**Share (%)**
China	100.9	26.3	China	41.4	41.9
United States	95.8	25.0	Taiwan Prov. of China	12.3	12.5
EU-15	63.2	16.5	Japan	8.3	8.4
Australia	35.7	9.3	EU-15	7.8	7.9
Taiwan Prov. of China	14.1	3.7	Lao PDR	7.1	7.2
Japan	11.1	2.9	Cambodia	4.6	4.6
Canada	10.8	2.8	Hong Kong, China	3.1	3.1
Hong Kong, China	7.5	2.0	Indonesia	2.9	3.0
Lao PDR	7.1	1.8	Singapore	2.6	2.6
Singapore	5.7	1.5	Malaysia	2.0	2.1
Cambodia	4.8	1.3	Russian Federation	1.6	1.6
Israel	4.3	1.1	Canada	1.4	1.5
Saudi Arabia	3.5	0.9	United States	1.1	1.1
Malaysia	3.4	0.9	Republic of Korea	1.1	1.1
Indonesia	2.9	0.8	Thailand	0.4	0.4

Source: COMTRADE.

* Table 20 is based on reporting by the exporting country, whereas annex tables A.7 and A.8 are based on import data by trading partners of Viet Nam.

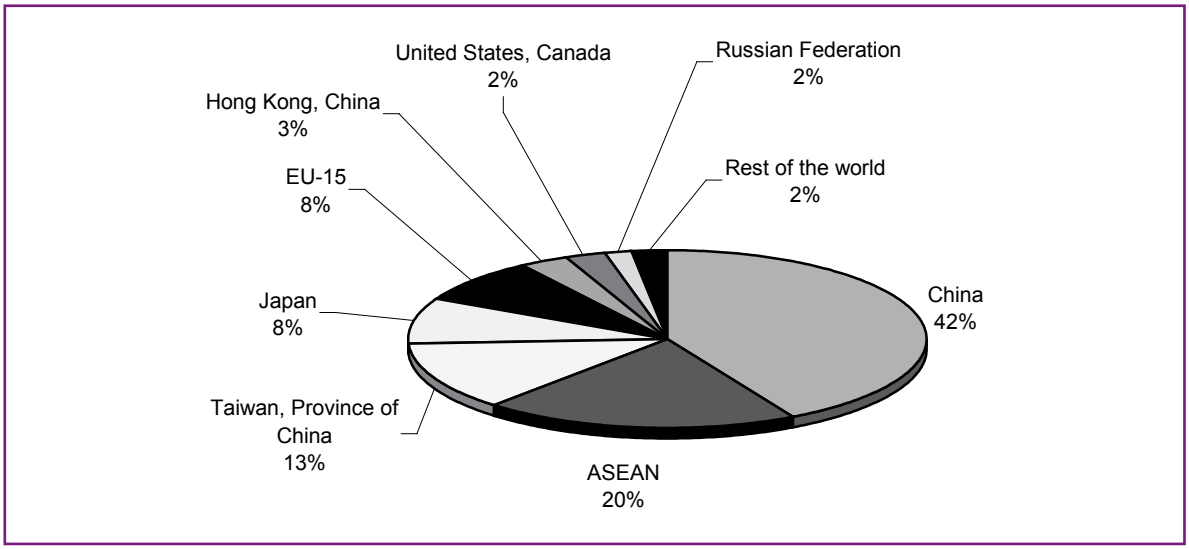
Figure 7. Share of main markets in Viet Nam's FFV exports (by value), 2003



Source: COMTRADE.

A major reason why Viet Nam exports FFV largely to neighbouring countries like China is because perishable products can be transported more safely over relatively short distances. Moreover, the import requirements in China have been found to be less strict with regard to food safety, quality and sanitary requirements compared to other markets, especially the EU. However, its exports to China now face increasing competition from Thailand, particularly as tariffs on Thai FFV to China have dropped to zero under the bilateral trade agreement between these two countries, while FFV from Viet Nam still face tariff rates of 12–24.5 per cent (Vietnam Investment Review, 2005).

Figure 8. Share of main markets in Viet Nam's FFV exports (excluding nuts, by value), 2003



Source: COMTRADE.

Several positive factors, such as a favourable climate, low labour costs and double-cropping seasons, put Viet Nam in a very competitive position in Asia and globally. It is one of the few countries in Asia (apart from China) that can grow large quantities of both temperate (in the north of the country) and tropical fruit and vegetables (in the central and southern parts). Much of the growth in exports will however depend on Viet Nam's ability to offer a reliable supply of safe products (World Bank, 2006: 6). Inconsistent quality and quantity have been the main constraints, due largely to a lack of appropriate varieties, poor post-harvest technology and weak supply chain management. FFV are produced mainly by small farmers: their farm sizes are usually less than 0.3ha for vegetables and less than 1ha for fruit.

A very small proportion of major tropical fruit are exported (table 21), the main exports (other than nuts) being minor tropical fruit: dragon fruit, longan, lychee, rambutan, pineapple, banana, mango and watermelon, the largest proportion of which go to Japan, ASEAN and Taiwan Province of China. The principal vegetables exported are baby corn, cabbage, cucumber, potato, onion, tomato, beans, cauliflower and chilli. For fruit (other than nuts), the main markets for these are Japan, ASEAN, Taiwan Province of China and the EU. Some Vietnamese exporters have been able to penetrate the European market and increase their revenue as a result of growing awareness of the food safety and quality requirements of this market among producers and exporters and greater efforts to conform to those requirements.

Table 21. Viet Nam: exports of FFV, 2001-2003

		Value of exports ($ million)				Share in total FFV exports 2003-2005 (%)
		2001	2002	2003	Average 2001-2003	
	FFV	422.1	355.9	383.7	387.2	100
	Fruit	263.3	135.5	57.5	152.1	39.3
057.3; 057.91; 057.95; 057.97	**Major tropical fruit**	5.1	4.2	2.3	3.9	1.0
057.98; 057.99; 058.21; 058.39	**Minor tropical fruit**	255.6	127.5	51.6	144.9	37.4
	Other fruit	2.6	3.7	3.6	3.3	0.9
	Nuts	117.9	179.3	285.0	184.1	50.1
057.71	**Coconuts**	4.7	5.5	6.3	5.4	1.4
057.73	**Cashew nuts**	105.7	171.3	276.7	184.5	47.7
	Other nuts	7.7	2.5	2.1	4.1	1.1
	Vegetables	40.9	41.1	41.2	41.1	10.6

Source: COMTRADE.

Importance of the EurepGAP standard in the main export markets

Apart from nuts, Viet Nam exports only a small proportion of its FFV (in terms of volume) to European countries, of which very few are certified to EurepGAP requirements. However, some Vietnamese exporters such as Bao Thanh Company have been successful in entering the European markets with EurepGAP certification (see below). Such certification could thus become a stimulus to the country's horticultural export revenue, and is being promoted through various donor-funded projects.

Implementation of good agricultural practices

Good agricultural practices concern measures to improve the quality and safety of agricultural products at the national and enterprise level. GAP is defined as "guidelines established to ensure a clean and safe working environment for all employees while eliminating the potential for contamination of the food products" (University of Maryland, 2002: 5). GAP involves addressing issues such as production site selection, land use, fertilizer and water usage, pest and pesticide control, harvesting, packaging, storage, field sanitation and product transportation.

In practice, GAP in Vietnam mainly deals with aspects such as site selection, land use, fertilizer and water usage, particularly pest/pesticide control. As a voluntary scheme at the national level, it can play an important role in encouraging sustainable production and food safety, particularly as enforcement of related laws and regulations is rather weak due to lack of resources and poor institutional coordination.

Safe vegetables programme and organically grown FFV

Excessive use of agrochemicals by Vietnamese farmers, following liberalization of the markets for agricultural inputs in 1992 seems to have led to a significant increase in the incidence of food poisoning.

In 1995, for instance, there were 13,000 documented cases of food poisoning, leading to 354 deaths in the Mekong River Delta in South Viet Nam alone (www.ykhoa.net/skds/MOITRUONG). Between 1999 and 2002, there were 19,500 documented cases and 250 deaths. The leading identified causes of illness and death were microbial infections, followed by chemical contamination and natural toxins present in the produce (Shepherd, 2006:28).[65] Anecdotal evidence from surveys undertaken in the Hanoi and Ho Chi Minh City markets shows that about 10 per cent of vegetables exceeded national standards for pesticide residues levels, and 2–3 percent showed use of banned pesticides (World Bank, 2006:xi). Food safety has therefore become a priority in the Government's development programme.

On the other hand, vegetables sold in traditional markets, tend to be grown with limited pesticides and therefore often show evidence of infestation that is unacceptable to consumers.

Safe vegetable programme

In response to the priority requirement for food safety arising particularly from the crisis in food poisoning during the period 1994–1997, MARD issued Temporary Regulations on Safe Vegetables Production (Decision 67/1998/ QD-BNN-KHCN) in 1998. The parameters for the programme include MRLs for nitrate and heavy metal content, pesticide residues and micro-organisms, derived mainly from FAO/WHO (Codex Alimentarius Residues in Food) recommendations. By definition, safe vegetables include all vegetables having authentic characteristics, with toxic chemical levels below the MRLs and microorganism levels also within tolerated limits, making them safe for consumers and the environment. Thus integrated pest management (IPM) is embedded in safe vegetable production. Since 1999–2000, the adoption of safe vegetable production has become more widespread. The safe vegetable scheme is voluntary for farmers, and the Government provides the necessary assistance to farming organizations for its implementation.

Inspection and certification are undertaken by an authorized local government agency. The certification process may vary depending on the province. In principle, the conditions to be met are clean soil, on-site availability of water resources and sound practices such as use of good seeds, appropriate use of organic and inorganic fertilizers, limited use of growth stimulants and pesticides, and appropriate pre-harvest intervals. Inspections and rapid testing to ensure that chemical residues are below the prescribed MRLs are being carried out, based on internationally acceptable testing methods for the analysis of pesticide residues. Safe vegetables have to be produced on farms certified by the Government. These must meet standards related to water quality, fertilizer and pesticide use (Shepherd, 2006:30). Normally certification bodies require the certificate to be renewed periodically after a prescribed time period, which could be one or two years, based on the actual production results, as in Ho Chi Minh City, or based on the satisfactory results of laboratory analysis of the vegetable samples, as in Dalat. The cost of analysis is usually subsidized by the Government (Gia, Bui thi et al. 2003).

There are many shortcomings regarding the implementation of the certification scheme:

- The analyses conducted are few and infrequent (1-2 times per year) due to budgetary constraints;
- Results of residue analyses tend to be inconsistent, mainly due to the methods used for rapid inspection and testing;
- Rapid standard tests used for quick results can detect only a few types of pesticides (e.g. organic phosphor). Thus a negative test result may not necessarily assure safe vegetables; and
- The sampling procedures used for the renewal of the certification may be subjective.

Inadequate quality control techniques used by the Government have led to public mistrust of the safe vegetables scheme (Gia, Bui Thi et al. 2003; Paule Moustier et al. 2005; Tam, Phan Thi Giac, 2005). The high price of safe vegetables is another concern to buyers. Growers of safe vegetables close to Ho

[65] It should be noted, however, that these cases of food poisoning and deaths were caused mainly by practices applied in factory canteens in industrial parks/zones. Therefore, catering practices played an important role in this. Furthermore, not all the cases were due to the consumption of fruit and vegetables; they may also have been caused by consumption of meat or fish.

Chi Minh City found that they could only sell 30 per cent of their production at higher prices through specialist outlets. The remainder had to be sold at wet markets at a lower price prevailing in those markets. Thus, for the farmers there is little incentive to subscribe to the safe vegetable scheme as the domestic market is unwilling/unable to pay higher prices for their produce (Shepherd, 2006:11).

Despite the high level of awareness of health risks arising from pesticide residues in vegetable production, the Vietnamese may still be consuming such vegetables daily. They purchase most of their fruit and vegetables from nearby street markets or small markets, the only precautions being that they try to buy from known and trusted vendors and visually inspect the produce for insect bites and appearance. Consumers tend to wash the vegetables carefully and cook them well before consumption (Figuíe, 2003 and 2004; Cadilhon and Giac Tam, 2004).

Organic production of fresh fruit and vegetables

In Hanoi, the production of organic vegetables began in 1999 at the initiative of non-governmental organizations (NGOs), the foreign-owned Hanoi Organics Company (Paule Moustier et al. 2005). In South Viet Nam, Hung Thien Company, which is owned by a EurepGAP technical consultant, also began growing organic vegetables. In general, this kind of production has limited success, as the quantity of produce sold is small.

Organic production of fruit, particularly grapes in Ninh Thuan province is more widespread. Conventional grapes produced mainly in Ninh Thuan province were found to contain excessive pesticide residues, which prompted the Government to offer help to improve the food safety image of the produce. A successful public-private partnership emerged that resulted in the trademark "Ba Moi organic grape".

Quality management system in Viet Nam

The quality management system in Viet Nam involves three main actors: the Government, the private sector and foreign companies. Under the government system, exports and imports of plant and plant products are inspected for a certificate of conformity by the Plant Quarantine Department.

There are eight such departments in the country that issue such a certificate, which is considered a mandatory requirement by customs authorities. Private quality management systems are based on third-party inspection services. In many cases, foreign customers rely on private sector inspectors to provide certificates for exported FFV. Foreign inspection and certification companies are not very popular in Viet Nam because their services are expensive. At present, the Institute for Marketecology (IMO Viet Nam) is the only international EurepGAP certifier operating in Viet Nam. Although it conducted an extensive campaign for promoting EurepGAP, there was very little positive response from farmers and farming organizations as the costs were considered prohibitive.

Similar to developments elsewhere, supermarkets are emerging as the main driving force behind the development of integrated supply channels in Viet Nam, but they are unevenly distributed. There are more than 46 supermarkets in Ho Chi Minh City alone, but fresh food accounts for less than 5 per cent of their total domestic sales in perishable food. There are few chains that directly link farmers to these retailers. In 2003, there were only three farm cooperatives (representing a total of 30ha) directly supplying supermarkets, restaurants and schools in Hanoi (World Bank, 2006:31).

The role of the government in the development of GAP schemes in Southern Viet Nam

In the development of national GAP schemes, the Government has adopted a public-private participatory approach rather than a traditional top-down approach, with an increasingly important role played by associations of producers, including farmer organizations. Two cases from southern Viet Nam illustrate this: the Ho Chi Minh City (HCMC) GAP programme and the Tien Giang GAP programme.

The Ho Chi Minh City GAP programme

The HCMC GAP programme, launched in November 2005, is being implemented jointly by many government authorities including the Department of Agriculture and Rural Development (DARD), the Department of Science and Technology (DOST), the Department of Trade (DoT), the Department of Health (DoH), the Bureau of Standard and Quality Measurement (BSQM), as well as farmer and consumer associations in Ho Chi Minh City. The government authorities implement the programme under the overall direction of the municipal board. The key objective of the programme is to create a municipal controlling and facilitating system. The system focuses on ensuring the prevention of microbial, parasitic and toxic contamination in fruit and vegetables, thereby promoting health and food safety in agricultural production. It has a twofold objective: to improve the quality of fruit and vegetables sold in the domestic market and to facilitate access to export markets through independent certification.

In keeping with these objectives, the Programme seeks to:

- Establish a criteria-based system under the responsibility of the DARD in collaboration with the BSQM, the farmer association and the consumer association;
- Launch an inspection and testing system under the responsibility of the DARD, the BSQM, the DOST and the DoH; and
- Set up a control system at critical points in the supply chain: producers (farmers, farm cooperatives), fruit and vegetable wholesale markets, companies and retail markets.

The municipal board is responsible for implementing the GAP programme at the request of either producers or traders. The producers are themselves liable for their produce and are obliged to operate according to the legislation.

The participatory approach taken by the HCMC GAP programme has facilitated the involvement of producers and traders. Given the inclusion of such mass associations as farmer and consumer associations, and independent certification, the programme guarantees transparency to producers, traders and consumers. However, the involvement of various government agencies that deal with control and certification poses problems of coordination and policy coherence, and undermines its independence. In addition, assigning key management roles to mass associations and NGOs has created numerous problems.

The Tien Giang GAP programme

The Tien Giang GAP programme was established in response to the great demand for guidance on GAP in the south of the country, especially in the provinces of the Mekong Delta, as the first attempt in the private sector to work towards meeting EurepGAP standards. This regional project was officially initiated in March 2005 by Vinafruit (a fruit farmers' association), which provides managerial coordination for the many participating institutions, government agencies, producers and scientists.

The programme aims to create a link between production and trading of safe fruit based on a set procedure, and to develop a trademark and marketing strategy for Vietnamese fruit both for the domestic and export markets. The programme has been implemented in six southern cities and provinces: Long An, Tien Giang, Vinh Long, Ben Tre, Dong Thap provinces and Ho Chi Minh City, and is estimated to cover 30 per cent of the total fruit cultivation area in the country.

The project had 56 members in 2005: 5 scientists, 26 producers, 19 companies and the Departments of Agricultural and Rural Development of the six target provinces as the representatives of the Government. Project implementation includes training on GAP, setting up a technical team in farm cooperatives and building up market segments for Vietnamese fruit. The programme focuses on five fruits: dragon fruit, bananas, mangoes, pomeloes and watermelons.

The forerunner of the Tien Giang GAP programme was the Vietnam Competitiveness Initiative (VNCI) sponsored by USAID, which aimed at developing a strategy for fruit clusters. Tien Giang GAP is a non-profit-making, NGO-run programme that is funded by various institutions, organizations and

producers as the main beneficiaries of the programme. Part of the programme was to assist a pilot group in Binh Thuan province with EurepGap certification to enable dragon fruit to be exported to the EU market and to facilitate the development of standards for this fruit.

Looking at the initial experience with the programme, the role of government authorities was essential for enhancing the coordination of the various participants. Nevertheless, Tien Giang GAP programme can be considered a turning point in shifting such a facilitating role from government authorities to Vinafruit. However, government authorities continue to keep a close eye on the programme.

The role of donor-funded projects and initiatives in national GAP implementation

In the past five years, several GAP projects have been launched or supported by various donor organizations. These include:

- The Swiss Import Promotion Programme (SIPPO), which aims to assist Vietnamese exporters to penetrate the EU and Swiss markets by providing information, contacts and training. EurepGAP was first introduced in Viet Nam under this project in 2000. The duration of the project is 10 years (1999–2009);
- The Vietnam Competitiveness Initiative (VNCI) project, which was sponsored by USAID to enhance the capacity of SMEs, largely by facilitating business linkages in the supply chain, including for agricultural products. Its aim was to develop GAP systems for dragon fruit producers and exporters in Binh Thuan and Tien Giang provinces. The duration of the project was four years (2003–2006). The Trade Capacity Building in Relation to the Application of Sanitary and Phytosanitary Measures (RAISE/SPS) project was also part of this project[66];
- The Japan International Cooperation Agency (JICA), which is financing a three-year project (2005–2008) to assist farmers in dragon fruit production for exporting to Japan;
- Competitiveness of selected agricultural subsectors/value chains, which is a component of the Small and Medium-sized Enterprises (SME) Development Programme of GTZ for a period of five years (2005–2009). The objectives of this component are to: (a) strengthen business and cooperative relationships between various stakeholders (production, processing, trade and services) of value chains for selected fruit (mangoes, pomeloes, longans, lychees, avocados), cashew nuts and vegetables; and (b) help establish a modern regulatory and legislative framework for the national distribution network; and
- The FAO also had three projects on horticultural production, but not directly related to EurepGAP:
  - Research on fruit flies (*Bactrocera dorsalis, B. correcta*) in fruit production for a period of one year (1999–2000);
  - Technology transfer (provision of seeds, training and a pilot model) for poor farmers in Ben Tre and Tra Vinh provinces (2000–2001); and
  - Emergency support for flood areas in Tien Giang, Dong Thap, Vinh Long and Can Tho provinces in 2001.

National conditions for EurepGAP implementation

This section analyses existing legislation containing provisions that may be relevant for EurepGAP implementation in the country. It analyses (a) existing general conditions that horticultural producers must comply with; (b) aspects of the Vietnamese legal framework that are relevant for the 14 sections of the EurepGAP Standard for Fruit and Vegetables (table 22); and (c) existing policies and enforcement provisions on key issues (table 23).

[66] In 2004, the USAID-funded VNCI and RAISE/SPS project, together with HortResearch (AusAid) and the Southern Fruit Research Institute (SOFRI) of Viet Nam, formed the Dragon Fruit GAP Project. VNCI focused on raising awareness of the importance of GAP and EurepGAP, supporting the pilot farmers' cooperative to be EurepGAP-certified, and identifying market access opportunities for dragon fruit, in particular for the pilot cooperative. The Ham Minh Dragon Fruit Cooperative formally received its EurepGAP certification in November 2006 (Embassy of the United States in Hanoi, United States Government Supports Ham Minh Dragon Fruit Cooperative Gain EurepGAP Certification, Press release, November 9, 2006).

Under Vietnamese regulations, horticultural producers must comply with the following conditions:

- The site for agriculture must not be polluted and must be isolated from sites affected by pollution and food contamination. It is the responsibility of the farmers to apply appropriate methods of waste treatment;
- The use of fertilizers, pesticides and other agrochemicals must conform with the relevant regulations. The Ministry of Agriculture and Rural Development regularly updates the list of allowed agrochemicals; and
- The producer is liable for the quality and safety of produce and its source.

It is the responsibility of producers to get their agricultural products certified by local public health authorities so that they meet the food safety requirements. Agriculture producers and traders who have registered themselves with the Department for Primary Industries (DPI) therefore have to get confirmation of the safety of their food produce from the local public health authorities. In addition, the product label on horticultural produce must include the name of the product (e.g. blue dragon), name and address of the producer, quantity, production and expiry date and storage period.

In Viet Nam, the legal framework for horticultural practices is enacted by the Standing Committee of the National Assembly in the form of a series of ordinances that are then implemented by the relevant administrative bodies in the form of decrees and decisions (table 22). Some provinces are formulating and implementing the Safe Vegetable Programme based on this legal framework. However, the framework does not cover all sections of the EurepGAP Standard for Fruit and Vegetables. For example, record keeping and self-inspection are not a legal obligation of the producer.

Table 22. Viet Nam: regulations of relevance to EurepGAP control points

Section	EurepGAP control point	Vietnamese legal framework
1	Traceability	Does not exist in the Vietnamese legal framework
2	Record keeping and internal self-inspection	Does not exist in the Vietnamese legal framework
3	Varieties and rootstocks	Decree N°. 57/2005/ND-CP (27 April 2005)
4	Site history and site management	Decree N°. 57/2005/ND-CP (27 April 2005)
5	Soil and substrata management	Does not exist in the Vietnamese legal framework
6	Fertilizer use	Decree N°. 113/2003/ND-CP (7 Oct. 2004) and Decision N°. 72/2004/QD-BNN (8 Dec. 2005) of the MARD
7	Irrigation/fertilization	Ordinance No. 12/2003/PL-UBTVQH 11 (26 July 2003) of the Vietnamese Standing Committee of the National Assembly
8	Crop protection	Ordinance No. 36/2001/PL-UBTVQH10 (July 25th 2001) of the Vietnamese Standing Committee of the National Assembly
9	Harvesting	Ordinance No. 12/2003/PL-UBTVQH 11 (July 26th 2003) of the Vietnamese Standing Committee of the National Assembly
10	Produce handling	Ordinance No. 12/2003/PL-UBTVQH 11 (July 26th 2003) of the Vietnamese Standing Committee of the National Assembly
11	Waste and pollution management, recycling and reuse	Ordinance No. 36/2001/PL-UBTVQH10 (July 25th 2001) of the Vietnamese Standing Committee of the National Assembly
12	Worker health, safety and welfare	Ordinance No. 12/2003/PL-UBTVQH 11 (July 26th 2003) of the Vietnamese Standing Committee of the National Assembly
13	Environmental issues	Ordinance No. 36/2001/PL-UBTVQH10 (July 25th 2001) of the Vietnamese Standing Committee of the National Assembly
14	Complaint form	Does not exist in the Vietnamese legal framework

Table 23 provides further details of relevant ordinances, decrees and decisions that form part of Viet Nam's legal framework set out in table 22, for major policy areas.

Legal provisions in Viet Nam that may be relevant for GAP implementation are very general, and guidance for implementation and monitoring is inadequate, unlike under EurepGAP. The Ministry of Health is the focal governmental agency on food safety issues. However, for implementation, it is not unusual to have more than two ministries responsible for one sector.

Table 23. Viet Nam: regulations affecting horticultural practices

Food hygiene	
Ordinance No. 12/2003/PL-UBTVQH 11 (26 July 2003) of the Vietnamese Standing Committee of National Assembly	Regulations on food hygiene
Decree No. 163/2004/ND-CP (7 Sep. 2004) of the Government	Details for implementation of articles of the ordinance on food hygiene
Plant protection and quarantine	
Ordinance No. 36/2001/PL-UBTVQH10 (25 July 2001) of the Vietnamese Standing Committee of National Assembly	Regulations on Plants Protection and Quarantine
Decree No. 58/2002/ND-CP (3 June 2002) of the Government	Regulations on plant protection, plant quarantine and pesticide management
Decree No. 26/2003/ND-CP (19 March 2003) of the Government	Punishment for violations of plant protection, plant quarantine and pesticide management
Decision No.15/2004/QD-BNN (14 April 2004) by the MARD	List of allowed and banned pesticides
Seed plants	
Decree No. 57/2005/ND-CP (27 April 2005) of the Government	Punishment for violations of seed plants
Produce quality	
Ordinance No. 18/1999/PL-UBTVQH10 (24 Dec. 1999) of the Vietnamese Standing Committee of National Assembly	State management of food quality
Decree No. 179/2004/ND-CP (21 Oct. 2004) by the Government	State management of quality of goods
Decision No. 05/2005/QD-BNN (30 Jan. 2005) by the MARD	Regulations on announcing quality assurance in agriculture
Fertilizers	
Decree No.113/2003/ND-CP (7 Oct. 2004) of the Government	State management of production and trading in fertilizers
Decision N°. 72/2004/QD-BNN (8 Dec. 2005) of the MARD	Regulations on production, trading and using fertilizers

The National Food Safety Laboratory (NFSL) network, which does the main analysis for the Ministry of Health, consists of laboratory units working at regional, provincial and district levels. Four laboratories in the different regions of Viet Nam are under the direct control of the Ministry. However, they are not fully utilized, and none has been accredited according to the ISO/EN 17025 standard so far. Moreover, differences exist between the regional laboratories in their capacity to analyse the vast array of chemical hazards and quality standards that are important for food safety control (World Bank, 2006: 48–49).

Viet Nam's experience in implementing EurepGAP: the case of dragon fruit

Rationale for the case study on dragon fruit

Dragon fruit has become one of the most important export products among the many horticultural products having high export potential. Because of this, many GAP initiatives are focusing on dragon fruit cultivation so as to address problems related to quality, post-harvest management and weak supply chain management. Fortunately this fruit is relatively tolerant to pests and diseases. Its export has had significant positive socio-economic impacts on a large number of poor smallholders in the rural areas of Binh Thuan, Tien Giang and Long An provinces.

Producers and exporters of dragon fruit

Dragon fruit are produced mainly in Binh Thuan (in the south-central region of the country), Tien Giang and Long An provinces (the Mekong river delta in the south of the country), for export largely to China, Taiwan Province of China and Hong Kong (China) (50 per cent), Malaysia (20 per cent), Singapore and Indonesia. Most of the commercial transactions, however, appear to have taken place at the Chinese and southern Vietnamese border areas without any customs clearance (Binh Thuan Department of Trade and Tourism, 2004). Exports to European markets (such as Germany, the Netherlands and France) accounted for 5–10 per cent of the total export revenue from dragon fruit in 2004 and Viet Nam has a 40 per cent share of the European market for this fruit (*Vietnam Economic Times* on 24/10/05).

In EU import statistics, dragon fruit is part of tariff items 08119040 (fresh passion fruit, carambola and pitahaya) and 081190 (frozen fruit and nuts). The value of EU-27 imports from Viet Nam for these two items was 9.1 million euros in 2006. In the same year, the value of fresh passion fruit, carambola and pitahaya imported from Viet Nam was 2.9 million euros (more than double the value in 2005), representing a share of 11.3 per cent of total extra-EU imports, with a volume of 976 tons.

Table 24. Viet Nam: dragon fruit production, output and export (in volume terms)

	Production area (ha)	Output (tons)	Exports (tons)
Binh Thuan in 2003	5 074	87 000	17,029 tons
Long An in 2005	1 700	25 000	n.a.
Tien Giang in 2004	1 950	27 000	n.a.

Source: Information provided by the Binh Thuan Department of Trade and Tourism, the Long An Department of Agriculture and Rural Development, as well as the Department of Agriculture and Rural Development.

In Binh Thuan, there are several enterprises with their own brand names: Ham Minh, Hoang Hau, Long Hoa, VinaH, SingGon, Phuong Giang and Kieu Nga, and one company that exports fruit and vegetables. While the first two enterprises are producers and exporters, the other four are only collectors and exporters. Hoang Hau company is currently one of the largest producers and exporters in the province with 100 hectares under cultivation, expected to be expanded to 300 hectares. In 2004, it exported 10,000 tons of produce, that earned it $3 million, and this was estimated to have increased to $3.5 million in 2005. Ham Minh is one of the biggest cooperatives/exporters of dragon fruit in Binh Thuan, and it obtained EurepGAP certification in November 2006.

Main problems in implementing the EurepGAP standard: lessons learned

In Viet Nam, activities related to the EurepGAP standard started in 2000 through the above-mentioned Swiss Import Promotion Programme. Two years later, government authorities and research institutions further promoted EurepGAP and its implementation. In 2003, Bao Thanh Co., which had participated in the activities of the Swiss Import Promotion Programme, decided to seek EurepGAP certification by investing in helping its suppliers in Binh Thuan province with EurepGAP implementation. Several professional institutes participated in the company's efforts, including the Institute for Marketecology (IMO Vietnam), which is now the only international EurepGAP certification body operating in Viet Nam, the Southern Sub-Institute of Agricultural Engineering and Post-Harvest Technology (SIAEP), Ho Chi Minh City Branch of the MARD and Binh Thuan provincial authorities.

Unfortunately the company's suppliers failed to successfully implement EurepGAP in 2003-2004, because there was unwillingness to cooperate in meeting the requirements, lack of human resources (especially agricultural engineers), a third reason was scattered farm sites and a fourth lack of effort (interview with owners of Bao Thanh Co., 2005). Nevertheless, kick-off activities yielded significant experiences and lessons. EurepGAP implementation was driven solely by the private sector, and it became clear that it needed the involvement and support of relevant government institutions and local authorities, such as a legal framework, support for setting up a satisfactory quality assurance infrastructure (e.g. accreditation/certification and a laboratory) and supportive/flanking policies, including financing for small producers. Moreover, the implementation of EurepGAP also requires cooperation and trust among the various actors in the supply chain.

EurepGAP covers the entire pre-farm-gate process: cultivation, harvesting, handling, packaging and storage. Apart from legal and commercial requirements with regard to appearance, shape and size (which are not covered by the EurepGAP standards), EurepGAP certification requires attention to other factors that can constitute additional challenges to the farmers, such as record keeping to ensure traceability, site history, site management, welfare and environmental issues. High investment costs are a major constraint, besides lack of trust in the supply chain.

Although the private sector may take the initiative for achieving EurepGAP certification, experience from the Bao Thanh company shows that it is important for such efforts to involve other stakeholders, including government agencies and subcontracted farmers. Tien Giang GAP in 2005, for instance, duly reflected the demands of all stakeholders and involved the relevant governmental bodies early in the process.

Key findings, conclusion and recommendations

Conclusions

The share of Viet Nam's FFV exports to European countries is relatively small (in terms of value), except for nuts. Apart from specific fruit, such as dragon fruit, overall, the EU-15 market accounted for only around 3 per cent of Viet Nam's total exports of fresh fruit (except nuts), in 2003. For vegetable exports, that market accounted for only around 6 per cent of Viet Nam's exports, in value terms, but again, this share has been higher for specific vegetables such as sweet corn. Thus, a fairly low proportion of the country's FFV may need to comply with EurepGAP requirements.

Some initiatives have been taken to promote GAP implementation in Viet Nam, but with limited success. This is attributable to the fact that GAP was not implemented using a clear and holistic approach. Governmental involvement and support has been inadequate. There has also been a lack of resources and poor coordination between the various agencies. Activities related to EurepGAP started in 2000 through various donor-driven projects, with technical involvement of government bodies and a few private companies. Although activities aimed at exploring EurepGAP implementation began largely as a private sector initiative, it soon became obvious that its implementation by farmers would need the involvement and support of relevant government institutions and local authorities and that such involvement is needed right from the beginning.

The Australian Agency for International Development, USAID and the Southern Fruit Research Institute (SOFRI), for instance, started the Dragon Fruit GAP Project in October 2005 to help the industry achieve standards that would be acceptable to European retailers, enabling better access to higher value export markets. Initial activities (training and demonstration projects) were to be carried out in Binh Thuan Province, and cooperation was established with exporters such as Metro Vietnam and Vegetexco to gain access to the EU and other Western markets. Farmers in other southern provinces were supposed to join later.

However, such projects have remained isolated initiatives or have run into problems. In the case of the Dragon Fruit GAP Project in Binh Thuan Province, the main problems encountered were: (i) little or no support or flanking measures by government institutions or local authorities, in particular technical and financial support, and lack of social recognition; (ii) lack of trust between the company investing in EurepGAP certification and suppliers, which is essential as implementation of EurepGAP requires the cooperation of various actors along the supply chain; and (iii) high start-up investment costs, which ultimately proved to be unaffordable. This does not alter the fact that some Vietnamese exporters such as Bao Thanh Company have been successful in entering the European markets with EurepGAP certification.

Recommendations

The following are some of the key recommendations arising from the study.

For the Government

In the short term (2–3 years):

- Establish a generic nationwide GAP framework for agricultural products, through a multi-stakeholder dialogue and a consultative working group;
- Develop implementation guidelines for specific subsectors;
- Develop policies to encourage producers and stakeholders to adopt GAP;
- Develop a road map for gradual implementation and conformity with international and or buyers' standards; and
- Organize awareness-raising and education campaigns for different targeted groups regarding GAP, including capacity-building for government and extension service officials; and developing markets for services.

In the medium term (5–7 years):

- Place more emphasis on setting up and maintaining an appropriate SMTQ system (i.e. standards, metrology, testing and quality assurance) at the national level; and

- Explore benchmarking or harmonization with regional (ASEAN), national (ChinaGAP and JGAP) and the GlobalGAP standards.

For businesses/enterprises

- Train personnel and enhance awareness among workers, especially those in processing enterprises. Greater awareness is more likely to induce workers to abide by regulations. Invest in human resources development and training to help meet strict requirements and to apply production methods that require advanced technologies and innovation;
- Build trust between the company seeking GAP certification and suppliers;
- Actively engage in national stakeholder consultations on conceptual and practical issues for developing national or regional GAP schemes and in creating appropriate public-private partnerships within national GAP programmes;
- Invest in technological innovation in order to apply quality/environmental management systems in conformity with HACCP, ISO 9,000, 14,001 and 22,000; and
- Establish long-term trading strategies, taking into account environmental standards and regulations, and carry out cost-benefit analyses.

GAP implementation

- GAP implementation should follow a holistic approach, with sufficient Government support and a clear understanding of the roles of the Government, the private sector and other stakeholders. The Government should be involved right from the beginning. Adequate attention should be paid to monitoring and enforcement; and
- In the conceptualization and implementation of national or regional GAP programmes, particular attention needs to be given to the concerns of and constraints facing small producers.

VII. RECENT DEVELOPMENTS AND THE WAY FORWARD

Recent developments

The Governments and private sector of the three countries examined in this monograph, Malaysia, Thailand and Viet Nam, have been advocating the use of GAP in the production of FFV. Its wider use has helped to increase efficiency in FFV production (including resource savings) and safer, healthier and better quality FFV for domestic consumers and export markets.

These countries have adopted incremental approaches to GAP development and implementation, with an initial focus on food safety (in particular safe agro-chemical use) followed by the gradual incorporation of additional requirements and attempts to meet the more demanding requirements of private GAP standards in international markets.

South-East Asian developing countries have been able to adopt a gradual approach for two reasons. First, since only a relatively small proportion of ASEAN FFV exports goes to the EU or to other markets with their own private GAP standards, the immediate and direct impact of the EurepGAP and similar private sector standards on ASEAN FFV producers and exporters has so far been relatively small. Second, whereas the rise of supermarkets has increased domestic demand for higher level third-party certification in South-East Asia, traditional markets have been resilient and have continued to be major markets for FFV (Vorley et al., 2006). Even where lead retailers have started to implement quality assurance schemes, they often adapt these schemes to local environments because of lack of both adequate suppliers and consumer purchasing power (Fulponi, 2007), as illustrated by the case of Tesco Lotus in Thailand.[67]

This gradual approach has facilitated the engagement of a relatively large number of farmers, including small-scale farmers in GAP implementation, in particular in Malaysia and Thailand. Alongside the wider use of GAP in FFV production, governments have adopted pragmatic and innovative instruments to support the marketability of produce from certified farms, for example through the activities of FAMA in Malaysia. Yet some problems have emerged. In particular governments may have been overly ambitious in targeting large numbers of GAP-certified farms and may have assumed too large a role, especially in certification and training, resulting in overstretching their implementation capacity. This, in addition to "soft" auditing as a strategy to convince small-scale growers that GAP implementation and certification is feasible, may have affected the quality and credibility of GAP certification. Also, whereas the provision of free certification services has helped small-scale growers' participation in GAP, there has been little or no development of a domestic private-sector certification infrastructure for third-party certification against higher level standards such as EurepGAP.

This has had two major effects. First, farmer acceptance of and participation in certification against national GAP standards has significantly increased, but these national standards are not recognized in international markets. Thus those producers and/or exporters who wish to target the EU market, for example, may be asked to show higher level EurepGAP certification. Second, local supermarket chains may largely ignore national GAP standards and instead either demand higher standards and third-party certification, such as EurepGAP, or develop their own (temporary) GAP schemes that aim at gradually pulling up suppliers to the EurepGAP standard.

One recent development is the drive towards EurepGAP benchmarking of SALM (an existing GAP standard) in Malaysia and an eventual ThaiGAP (once fully crafted and operational) in Thailand. These initiatives are only briefly analysed in this monograph, since they emerged after the country case studies had been prepared at the end of 2005 and subsequently discussed in a number of national and regional workshops in South-East Asia and Geneva. Some of the issues raised in these initial analyses were discussed with officials, private-sector actors and other stakeholders in September 2007 at the 8th EurepGAP Asia Conference in Bangkok and at the seminar on EurepGAP-SALM Accreditation and Export of Agro-Produce in Kuala Lumpur.

[67] In this context, Fulponi (2007) observes that two types of retailers coexist: the core or lead retailers and the medium-scale fringe retailers. She notes: "While the standards of the core are likely to diffuse over time, at present there is still room for those who need time to upgrade. Fringe markets provide access to a wider range of producers both in the domestic and international markets, a factor that needs to be considered in a development-oriented framework."

The current interest in benchmarking national schemes to EurepGAP in Malaysia and Thailand could be attributed to: (i) export considerations and (ii) domestic market considerations.

With regard to export considerations, producers and exporters targeting markets where EurepGAP certification is required may find it difficult to obtain such certification directly for the reasons mentioned above. From an individual exporter's perspective, demonstrating GAP compliance to importers or customers in external markets is however often an essential requirement. European importers and retailers, for example, increasingly demand certification to EurepGAP or an equivalent standard. Producers and exporters also derive pride from meeting stringent standards that enjoy broad market recognition. The country as a whole may also gain to the extent that EurepGAP benchmarking of a national GAP standard may help to improve the country's image with regard to the safety and quality of its FFV, thereby contributing to the competitiveness of its exported produce. For example, European supermarkets usually indicate the origin of the FFV they sell. Thailand's "kitchen of the world" project illustrates the importance that the Government and private sector attach to the country's image. Conforming to higher standards for FFV produce may also be seen as part of a move towards targeting higher level segments of export markets as a means of addressing competition from low-cost producers such as Viet Nam. Finally, with more countries in South-East Asia seeking EurepGAP benchmarking, the process towards meeting a higher standard with international recognition will be accelerated and may be a useful strategy to promote harmonization of GAP standards in regional markets.

With regard to domestic market considerations, producers supplying supermarket chains in the domestic market or in other South-East Asian markets may also need to respond to a growing demand for higher level certification than the existing (government-run) national GAP systems. Thus, even through the increasingly stringent requirements of supermarkets may so far have had a relatively small impact on the FFV exports of South-East Asian countries to Europe, a number of large European supermarkets have started operations in South-East Asia, and such FDI may augment the pressure for higher level GAP certification through local procurement policies and practices (in Thailand, for instance, several retailer-specific GAPs have recently emerged). Key fruit and vegetable producers and traders may be interested in the development of a harmonized higher level third-party certification standard for the domestic (and export) market to counter the proliferation of retailer-specific GAPs and thus preclude the need for multiple certification requirements.

However, for growers who are producing for the domestic market (other than large supermarket chains) or for less demanding export markets, higher level certification is expensive and may not provide a significant economic advantage. For these producers, gradually upgrading of national GAP schemes remains the preferable, if not the only, option for GAP implementation and certification. Addressing food safety and traceability should form the core of the first steps before incorporating other requirements in GAP. An appropriate strategy for creating awareness and capacity building of these traditional farmers should be clearly defined and should form the core basis of all efforts to promulgate the implementation of GAP systems. There is however a risk that too rapid upgrading of the requirements of national GAP schemes may significantly inhibit further spread in the use of GAP by small-scale producers and increase the possibility of their marginalization. It would thereby disconnect those that are most in need of pro-poor development efforts from international markets and local supermarket supply chains.

Interestingly, the development of GAP standards aimed at EurepGAP benchmarking in Japan (JGAP) and China (ChinaGAP) have revealed the utility of different certification levels which take into account the needs of producers that do not need EurepGAP- equivalent certification. The JGAP, for example, has two "frameworks" for certification: "framework 1" for those that need JGAP certification *without* EurepGAP equivalence and "framework 2" for those that need JGAP certification *with* EurepGAP equivalence. With regard to documentation requirements, both work with the JGAP control points and compliance criteria (CP/CC). However with regard to the general requirements (GR) "framework 1" uses JGAP GR whereas "framework 2" uses EurepGAP GR. The advantage of this approach is that JGAP CP/CC may gain both domestic and international recognition (Takeda, 2007). Similarly, ChinaGAP has introduced a "first class" certification level for those who need to show EurepGAP equivalence and "second class" certification for those who do not. Whereas full compliance with "major must" and 95 per cent compliance with "minor must" criteria are required for "first class"

certification, only "major must" criteria must be complied with for "second class" certification (Zhigang, 2007).

In light of the above, one of the most strategically important issues therefore is how to take account of the differing needs and capacities for GAP implementation and certification of a large number of diverse producers and other actors in the supply chain, targeting markets with very different characteristics. Discussions on the EurepGAP-benchmarking of SALM and the development of ThaiGAP already reveal the possible need for different certification levels.

As a result, modular approaches on GAP design and implementation are emerging in Malaysia and Thailand. Such approaches at the national level call for a coherent shaping of the "GAP modules" aimed at: (i) assuring the integrity of the whole system; (ii) allowing graduation from a simpler to a more advanced module; and (iii) creating interfaces between the modules. All this should serve to avoid confusion among producers and consumers, ease access to domestic and foreign markets and reduce or optimize certification costs.

Governments are called upon to actively participate in the shaping of the whole system, particularly with the objective of assuring a coherent approach that reflects development priorities, and to safeguard the integrity of the whole system. Governments may want to fully integrate government-run or sponsored national GAP programmes into the modular approach and improve their effectiveness and credibility, for instance by outsourcing certification to third-party certifiers in the private sector and by improving the functioning and resources of the government institutions that run these national GAP schemes. At the same time, it may be advisable for them to implement certain flanking or supportive measures to address existing shortcomings in specific areas, such as the provision of temporary bridging funding to farmers, and improvements in infrastructure and related institutions for quality assurance and in physical infrastructure.

In addition, special government (including donor) support could be targeted at retaining or integrating small farmers into the various GAP schemes. The examples of Malaysia and Thailand demonstrate that such support efforts could be focused on forming stable and well-managed groups of smallholders, improving related infrastructure and creating marketing channels that link small producers to large supermarkets. For some time, governments may also partly or fully cover certification costs of small producers, in particular when these concern government-run GAP schemes. Perpetuation of such subsidies should however be avoided to assure credibility of certification and real sustainability of smallholder production under GAP.

This should not mean that government support should only or mainly be directed towards linking small producers to modern supply chains (at the national and/or international level), because they represent the most advanced and most dynamic segment of modern agriculture. As Humphrey (2006b: 587) has noted, "given the continued importance of traditional marketing channels, improving the efficiency of these channels could easily outweigh any potential benefits from the expansion of small farmer production either for export or for domestic supermarkets." Governments might therefore consider investing in traditional local market outlets to improve their quality management and handling practices, thus reinforcing the "quality pull factor" of various GAP schemes and large national supermarkets and encourage smallholders to gradually integrate into government-run GAP schemes. In addition, small farmers could be assisted in exploring the potential for (i) niche markets, such as organic production or fair trade produce; (ii) "less demanding" export markets; and (iii) wage labour in agricultural production and post-harvest processing on large farms, as wage-based employment may be just as poverty-reducing as smallholder production (Humphrey, 2006b: 587-588). Such government support may provide new opportunities to those smallholders that cannot cope with GAP requirements in the short and medium term and thus reduce the risk of their marginalization.

Implications for developing clear GAP concepts and related policy dialogue

Compared to developing countries that were early movers in EurepGAP benchmarking (in particular Chile, Mexico and Kenya),[68] the starting position for Malaysia and Thailand's benchmarking initiatives

[68] These experiences have been examined in other, similar manuscripts prepared under UNCTAD's CTF.

is different in several respects. First, Chile, Mexico and Kenya already exported large volumes of FFV to developed countries where private-sector standards play an important role in the marketplace. The value of Mexico's and Chile's FFV exports to the EU and the United States reached $5 billion and $2 billion respectively in 2006. Kenya is a smaller FFV exporter in absolute terms (less than $200 million in 2004), but FFV exports represent around 14 per cent of its total agricultural exports, and over 90 per cent go to the EU market (in value terms). Malaysian and Thai FFV exports are much lower in value, and only a small proportion goes to the EU market.

Second, the objectives for seeking benchmarking were straightforward and related to exports to the EU (or in the case of Chile and Mexico also to the United States). Chile needed to avoid multiple audits for exporters targeting both the EU and United States markets. Kenya had to address the elimination of smallholders from supply chains to European supermarkets. The objectives of benchmarking in the Malaysian and Thai cases, on the other hand, seem more complex.

In the Asian context, EurepGAP benchmarking, apart from facilitating exports to the EU market, may be seen more as a means of anticipating possible future market developments, including those in the regional and domestic market. In Japan too, the objectives of benchmarking go beyond trade. For example, JGAP opted for benchmarking not only to facilitate exports of Japanese produce, but also to gain international recognition of the standard as well as its acceptance among Japanese retailers and distributors (Takeda, 2007).

Thus there is a particularly strong need for stakeholder dialogues and market intelligence to clarify the concept and objectives of national GAP approaches and benchmarking of GAP systems, as well as to ensure that the standards respond to market realities. Although the importance of exploring a coherent modular approach to the development of standards (whether by introducing modules with higher, EurepGAP-equivalent requirements than the baseline standard, or by providing options for a lower level of certification than a EurepGAP-benchmarked standard for those that do not need EurepGAP equivalence) and related supportive policies is self-evident, in reality this is the exception rather than the rule. In many cases, different modules are being shaped using a learning-by-doing approach, which is not necessarily bad in itself but may create higher costs at micro- and macro-economic levels as well as confusion among producers and consumers. UNCTAD's Consultative Task Force on Environmental Requirements and Market Access for Developing Countries (in close cooperation with FAO) can play a useful role in helping to clarify the concept and objectives of national GAP approaches by facilitating national stakeholder dialogues and exchange of experiences among developing countries (e.g. at the regional level).[69]

Finally, the particular characteristics of national GAP schemes and the market realities described above may also require flexibility in the benchmarking process and support from the EurepGAP secretariat. EurepGAP has been successful in working towards benchmarking of single-tier and private-sector-owned standards. However, EurepGAP should be open-minded about the overall context of GAP objectives in developing countries and the modular character of GAP standards there. In addition, there is a need to carefully analyse the impacts of future revisions of the EurepGAP standards on national GAP standards. Following the preparation of this monograph, EurepGAP changed its name to GlobalGAP on the basis that its proclaimed role in harmonizing GAP standards have gone beyond Europe. This development implies the need for more active participation in and contributions of developing countries to future GlobalGAP revisions. The GlobalGAP secretariat could facilitate this; indeed, the recent appointment of an Observer for Africa in the GlobalGAP sectoral committees is a step in the right direction.

[69] See, for instance, the debate and recommended follow-up activities of the joint FAO-UNCTAD Workshop on Good Agriculture Practices in Eastern and Southern Africa: Practices and Policies, held in Nairobi on 6-9 March 2007, accessible at: www.unctad.org/trade_env/meeting.asp?MeetingID=217.

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Statistical Annex

Table A.1. Production of fruit and vegetables of ASEAN member States, and shares in world production and production of all developing countries

	1979-1981	1989-1991	1999-2001	2003	2004
Production (thousand tons)					
Brunei Darussalam	12	10	14	15	16
Cambodia	493	711	792	798	800
Indonesia	6 648	10 257	15 402	20 399	22 357
Lao PDR	163	216	730	1 005	960
Malaysia	1 244	1 459	1 672	1 797	1 818
Myanmar	2 169	2 984	4 838	5 530	5 583
Philippines	1 1115	12 643	15 589	17 057	17 795
Singapore	48	9	5	5	5
Thailand	9 101	8 962	10 876	10 922	11 332
Viet Nam	4 993	6 509	10 923	12 726	13 254
ASEAN	35 987	43 759	60 842	70 254	73 920
Developing countries*	36 4404	54 4361	920 507	1 059 128	1 085 247
World	62 9744	81 2733	1 207 588	1 345 056	1 383 649
Share of case study countries in production of all developing countries (%)					
Malaysia	0.34	0.27	0.18	0.17	0.17
Thailand	2.50	1.65	1.18	1.03	1.04
Viet Nam	1.37	1.20	1.19	1.20	1.22
ASEAN	4.21	3.11	2.55	2.40	2.43
Share of case study countries in world production (%)					
Malaysia	0.20	0.18	0.14	0.13	0.13
Thailand	1.45	1.10	0.90	0.81	0.82
Viet Nam	0.79	0.80	0.90	0.95	0.96
ASEAN	2.44	2.08	1.94	1.89	1.91

Source: *FAO Statistical Yearbook* (various years).

* Excluding developing countries in Central Asia.

Table A.2. Principal developing-country exporters of FFV (in descending order of export earnings), 2005

Rank	FFV (HS 0701-0713, 071420, 08) Exporter	Value ($ m)	Fruit, excluding nuts (HS0803-0814) Exporter	Value ($ m)	Vegetables (HS 0701-0713, 071420) Exporter	Value ($ m)
1	Mexico	4 590.4	Chile	1 864.5	Mexico	3 116.1
2	China	4 039.3	Mexico	1 358.9	China	2 971.9
3	Turkey	3 034.2	Turkey	1 251.9	India	569.8
4	Chile	2 037.7	South Africa	1 182.3	Turkey	533.2
5	India	1 423.1	Ecuador	1 145.8	Morocco	309.0
6	Iran, Islamic Rep. of	1 381.6	Costa Rica	920.9	Peru	259.3
7	South Africa	1 286.7	China	868.7	Argentina	240.9
8	Ecuador	1 202.0	Argentina	781.9	Jordan	214.1
9	Argentina	1 023.6	Colombia	544.4	Thailand	198.8
10	Costa Rica	947.0	Iran, Islamic Rep. of	528.0	Kenya	161.1
11	Morocco	777.2	Morocco	456.8	Syrian Arab Rep.	135.5
12	Brazil	690.5	Brazil	452.4	Iran, Islamic Rep. of	126.4
13	Philippines	605.3	Philippines	447.7	Pakistan	109.9
14	Colombia	573.9	Guatemala	355.9	Guatemala	103.7
15	Thailand	511.9	Thailand	288.5	Malaysia	103.4
16	Guatemala	473.1	Panama	236.0	Korea, Rep. of	101.0
17	Peru	425.8	India	232.8	Chile	80.3
18	Viet Nam (2003)	373.8	Honduras	193.5	Taiwan, Prov. of China	72.7
19	Ghana	357.3	Côte d'Ivoire	148.1	Saudi Arabia	66.0
20	Côte d'Ivoire	255.9	Peru	146.5	Ecuador	56.1
21	Panama	253.4	Tunisia	123.1	Viet Nam	41.2
22	Indonesia	247.1	Pakistan	99.4	Indonesia	**41.0**
23	Jordan	246.3	Korea, Rep. of	85.5		
24	Honduras	228.2	Uruguay	70.6		
25	Korea, Rep. of	221.7	Malaysia	69.5		
26	Pakistan	211.3	Cameroon	68.5		
27	Kenya (2004)	204.4	Azerbaijan	62.0		
28	Syrian Arab Republic	195.5	Viet Nam (2003)	60.3		
29	Malaysia	186.1				
	ASEAN	2039.5	ASEAN	914.6	ASEAN	487.9

Source: COMTRADE.

Table A.3. EU-27 imports of FFV, in value terms, and principal developing-country suppliers (in descending order), 2006

Rank	FFV (HS 07 and 08) Exporter	Value (million euros)	Fruit, including nuts (HS 08) Exporter	Value (million euros)	Vegetables, including manioc (HS 07) Exporter	Value (million euros)
1	Turkey	1 478.2	Turkey	1233.7	China	399.4
2	South Africa	988.0	South Africa	972.1	Morocco	389.7
3	Costa Rica	880.2	Costa Rica	866.5	Turkey	244.5
4	Chile	874.6	Chile	838.7	Egypt	187.5
5	Ecuador	716.1	Ecuador	692.0	Kenya	176.9
6	Morocco	668.5	Colombia	627.0	Argentina	112.5
7	Colombia	627.9	Brazil	495.2	Peru	111.2
8	China	610.7	Argentina	486.9	Thailand	74.2
9	Argentina	599.4	Morocco	278.7	India	63.6
10	Brazil	501.7	India	236.5	Mexico	57.3
11	Egypt	309.5	Panama	225.8	Chile	35.9
12	India	300.1	Côte d'Ivoire	225.8	Ecuador	24.1
13	Peru	261.9	China	211.4	Senegal	21.8
14	Côte d'Ivoire	227.0	Iran, Islamic Rep. of	200.5	Ghana	21.2
15	Panama	226.3	Cameroon	187.3	Ethiopia	18.4
16	Iran, Islamic Rep. of	202.2	Peru	150.7	Guatemala	16.8
17	Kenya	199.4	Egypt	122.0	South Africa	15.9
18	Cameroon	190.5	Dominican Republic	119.4	Zambia	15.2
19	Mexico	128.6	Viet Nam	101.1	Costa Rica	13.7
20	Dominican Republic	125.6	Tunisia	76.3	Tunisia	11.6
21	Thailand	108.5	Mexico	71.3	Syrian Arab Rep.	10.0
22	Viet Nam	107.6	Uruguay	69.5	Bangladesh	9.4
	Philippines	34.2	Thailand	34,3	Viet Nam	6.5
	Indonesia	22.5	Philippines	34.0	Malaysia	1.0
	Malaysia	10.0	Indonesia	21.5	Indonesia	0.9
	Singapore	2.5	Malaysia	9.1	Singapore	0.5
			Singapore	2.0	Philippines	0.2
	Extra-EU-27	14 790.1	Extra-EU-27	11 763.5	Extra-EU-27	3 026.6

Source: European Commission, Export Helpdesk for Developing Countries.

Table A.4. ASEAN: exports of fresh fruit to principal markets, 2005

	World	Main regional markets					Other Asian developing countries	West Asia	EU-15	United States and Canada
		Subtotal	ASEAN	China	Japan	Hong Kong (China), Taiwan Prov. of China, Rep. of Korea				
	Exports ($ million)									
Indonesia	15.2	10.1	3.4	2.3	0.5	3.9	2.9	1.5	0.6	0.1
Malaysia	69.5	59.0	40.2	1.6	0.1	17.0	0.8	1.1	7.8	0.5
Philippines	447.7	357.5	5.7	36.5	224.2	91.0	37.0	34.5	1.6	3.9
Singapore	35.6	32.9	31.4	0.0	0.1	1.4	0.4	0.3	0.8	0.0
Thailand	288.5	231.5	67.9	98.7	14.9	50.0	2.7	7.4	16.7	22.3
Viet Nam	57.5	53.8	5.8	40.6	0.4	6.9	0.0	0.0	1.7	0.5
ASEAN	914.1	744.7	154.6	179.8	240.1	170.2	43.7	44.7	29.4	27.3
	Share of main export market (per cent)									
Indonesia	100	66.1	22.4	15.2	3.0	25.6	19.0	9.9	4.2	0.6
Malaysia	100	84.8	57.9	2.4	0.1	24.4	1.2	1.6	11.2	0.7
Philippines	100	79.8	1.3	8.2	50.1	20.3	8.3	7.7	0.4	0.9
Singapore	100	92.5	88.3	0.1	0.3	3.8	1.0	0.8	2.4	0.0
Thailand	100	80.2	23.5	34.2	5.2	17.3	0.9	2.5	5.8	7.7
Viet Nam	100	93.4	10.1	70.6	0.7	12.1	0.0	0.0	3.0	0.9
ASEAN	100	81.5	16.9	19.7	26.3	18.6	4.8	4.9	3.2	3.0

Source: COMTRADE.

Table A.5. ASEAN: exports of nuts to principal markets, 2005

	World	Main regional markets					Other Asian developing countries	West Asia	EU-15	United States and Canada
		Subtotal	ASEAN	China	Japan	Hong Kong (China), Taiwan Prov. of China, Rep. of Korea				
	Exports ($ million)									
Indonesia	190.9	65.9	62.1	0.8	0.3	2.7	99.9	1.5	5.0	8.3
Malaysia	13.2	4.3	3.9	0.0	0.0	0.3	4.4	2.3	0.6	0.0
Philippines	129.1	15.3	6.5	0.2	3.5	5.2	1.2	0.4	45.8	41.6
Singapore	44.6	11.7	11.2	0.1	0.1	0.3	2.2	1.4	17.2	1.0
Thailand	24.6	7.7	2.7	1.0	0.3	3.7	9.8	1.2	0.7	3.7
Viet Nam	285.0	74.0	5.3	59.5	2.8	6.4	0.5	5.0	55.4	104.0
ASEAN	687.4	179.0	91.7	61.7	7.0	18.6	118.1	11.7	124.7	158.6
	Share of main export market (per cent)									
Indonesia	100	34.5	32.5	0.4	0.1	1.4	52.3	0.8	2.6	4.4
Malaysia	100	32.3	29.4	0.1	0.1	2.6	32.9	17.5	4.7	0.1
Philippines	100	11.9	5.0	0.1	2.7	4.0	1.0	0.3	35.5	32.2
Singapore	100	26.3	25.2	0.3	0.2	0.6	5.0	3.1	38.4	2.2
Thailand	100	31.3	11.0	4.1	1.3	14.9	39.9	4.7	2.9	15.1
Viet Nam	100	26.0	1.9	20.9	1.0	2.2	0.2	1.7	19.4	36.5
ASEAN	100	26.0	13.3	9.0	1.0	2.7	17.2	1.7	18.1	23.1

Source: COMTRADE.

Table A.6. ASEAN: exports of fresh vegetables to principal markets, 2005

	World	Key regional markets					Other Asian developing countries	West Asia	EU-15	United States and Canada
		Subtotal	ASEAN	China	Japan	Hong Kong (China), Taiwan Prov. of China, Rep. of Korea				
					Exports ($ million)					
Indonesia	41.0	37.9	24.1	0.4	7.8	5.7	0.7	0.1	0.7	1.5
Malaysia	103.4	95.9	94.5	0.1	0.5	0.8	0.4	3.1	1.1	1.5
Philippines	28.4	26.3	4.4	0.1	20.9	0.9	0.0	0.0	0.0	2.0
Singapore	25.2	22.2	20.2	0.1	0.0	1.9	1.8	0.0	0.1	0.2
Thailand	198.8	121.5	15.3	0.9	86.2	19.2	2.2	3.6	47.8	11.6
Viet Nam	41.2	32.0	13.8	0.7	7.9	9.6	0.0	0.0	6.1	2.1
ASEAN	437.9	335.1	172.3	1.5	123.2	38.0	5.0	6.9	55.8	18.9
					Share of main regional market (per cent)					
Indonesia	100	92.4	58.8	0.9	19.0	13.9	1.6	0.3	1.7	3.7
Malaysia	100	92.8	91.4	0.1	0.5	0.8	0.3	3.0	1.0	1.4
Philippines	100	92.4	15.6	0.2	73.5	3.1	0.0	0.1	0.1	7.1
Singapore	100	88.0	80.2	0.3	0.0	7.5	7.0	0.1	0.5	0.8
Thailand	100	61.1	7.7	0.4	43.4	9.6	1.1	1.8	24.0	5.8
Viet Nam	100	77.8	33.5	1.8	19.2	23.3	0.0	0.0	14.9	5.0
ASEAN	100	76.5	39.4	0.3	28.1	8.7	1.1	1.6	12.8	4.3

Source: COMTRADE.

Table A.7. Major markets for FFV from Viet Nam, 1997-2005 ($ million)

	1997	1998	1999	2000	2001	2002	2003	2004	2005
					FFV				
United States	16.6	24.4	25.1	53.6	51.0	74.8	104.5	179.6	160.8
EU-15	13.4	24.9	17.0	36.0	44.7	50.4	77.1	90.0	120.8
China	4.1	4.5	6.9	12.3	49.7	69.7	69.4	32.7	58.3
Australia	12.5	16.1	16.0	21.4	19.5	23.5	35.2	47.7	55.3
ASEAN	6.5	4.8	7.3	4.7	6.8	8.6	12.1	18.5	26.6
Canada	4.0	4.0	4.5	6.7	8.2	9.0	16.4	24.4	23.4
Taiwan Prov. of China	n.a.	n.a.	n.a.	13.4	15.3	13.8	12.3	23.1	23.1
Japan	7.2	7.3	7.2	9.4	12.3	13.9	14.2	20.1	22.1
Hong Kong (China)	8.1	13.3	5.3	5.7	16.8	13.7	9.8	8.4	11.9
Rest of the world	8.9	5.9	10.5	8.8	6.9	10.7	20.6	17.6	46.5
Total	81.3	105.2	99.8	172.0	231.2	288.1	371.6	462.1	548.8
					Fruit				
China	1.7	2.8	5.4	10.0	36.4	51.6	57.0	25.8	47.0
EU-15	2.5	3.5	4.0	4.8	4.4	6.3	7.4	8.0	10.9
Hong Kong (China)	0.9	4.6	3.3	4.5	4.4	4.3	4.6	6.2	8.1
Taiwan Prov. of China	n.a.	n.a.	n.a.	5.0	5.3	4.2	3.7	4.3	8.1
ASEAN	0.8	1.1	1.1	1.2	2.0	2.3	3.8	5.6	6.1
Rest of the world	2.7	3.4	3.8	4.8	4.8	7.2	7.1	8.7	8.5
Total	8.7	15.5	17.6	30.3	57.3	75.9	83.6	58.6	88.7
					Nuts				
United States	16.0	23.5	23.6	52.1	49.8	72.3	102.6	177.1	159.0
EU-15	7.1	17.8	8.2	25.5	34.0	38.3	63.3	76.0	103.5
Australia	12.2	15.9	15.7	21.1	19.3	23.3	35.0	47.0	54.8
Canada	3.5	3.4	3.2	5.2	7.2	6.7	14.3	21.4	21.0
China	2.3	1.6	1.5	2.2	13.1	17.5	12.1	6.3	11.1
ASEAN	2.0	0.2	0.3	0.5	0.4	2.0	1.8	4.5	8.3
Rest of the world	15.1	12.9	11.4	11.5	23.3	25.1	25.6	31.0	50.9
Total	58.2	75.3	63.9	118.1	147.1	185.2	254.7	363.3	408.6
					Vegetables				
Japan	5.1	5.5	4.9	5.8	6.8	6.3	8.8	13.7	16.9
ASEAN	3.7	3.6	5.8	2.9	4.4	4.2	6.4	8.4	12.2
Taiwan Prov. of China	n.a.	n.a.	n.a.	7.0	8.6	7.1	7.8	5.7	9.9
EU-15	3.7	3.6	4.8	5.7	6.3	5.6	6.4	7.0	6.4
Rest of the world	1.9	1.7	2.8	2.3	2.0	3.9	4.0	5.5	6.1
Total	14.4	14.4	18.3	23.7	28.1	27.1	33.4	40.3	51.5

Source: COMTRADE, based on import data reported by trading partners.

Table A.8. Imports of FFV from Viet Nam as a share of FFV imports from the world, from all developing countries and from ASEAN (per cent), 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Imports from Viet Nam as a share of imports from the world									
FFV	0.23	0.29	0.26	0.45	0.59	0.68	0.76	0.84	0.90
Fruit	0.04	0.08	0.08	0.14	0.26	0.32	0.30	0.19	0.26
Nuts	1.35	1.90	1.53	2.87	3.83	4.42	5.18	5.79	5.30
Vegetables	0.13	0.12	0.15	0.19	0.20	0.19	0.21	0.22	0.27
Imports from Viet Nam as a share of imports from all developing countries									
FFV	0.36	0.46	0.40	0.71	0.92	1.06	1.18	1.28	1.37
Fruit	0.06	0.11	0.12	0.21	0.38	0.46	0.43	0.27	0.36
Nuts	2.07	2.94	2.25	4.29	5.94	6.88	8.23	9.64	9.03
Vegetables	0.23	0.22	0.27	0.35	0.37	0.34	0.37	0.40	0.47
Imports from Viet Nam as a share of imports from ASEAN									
FFV	4.6	6.6	5.8	8.7	10.7	11.9	14.0	15.6	16.4
Fruit	0.9	1.7	1.6	2.4	4.6	5.5	5.6	3.5	5.1
Nuts	19.4	23.8	22.3	36.8	51.9	46.6	47.8	56.1	53.2
Vegetables	3.1	3.7	5.4	5.9	4.5	4.2	5.2	6.0	6.2

Source: COMTRADE.

Table A.9. China: imports of FFV from the world and from selected ASEAN countries, 1997-2005

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Value ($ millions)									
World	282.2	281.1	303.3	428.0	423.3	429.4	542.8	679.7	760.9
Developing countries	226.2	221,2	213.6	306.6	280.3	290.0	360.8	445.3	498.6
ASEAN	120.7	132.5	109.5	166.5	199.7	217.9	250.0	308.0	348.7
Malaysia	3.3	3.5	1.9	3.2	3.5	3.3	2.9	3.9	3.3
Thailand	55.2	34.7	31.2	62.4	73.2	71.2	83.8	181.6	181.8
Viet Nam	4.1	4.5	6.9	12.3	49.7	69.7	69.4	32.7	58.3
Shares in total imports (per cent)									
World	100	100	100	100	100	100	100	100	100
Developing countries	80.2	78.7	70.4	71.6	66.2	67.7	66.5	65.5	65.5
ASEAN	42,8	47.1	36.1	38.9	47.2	50.7	46.1	45.3	45.8
Malaysia	1.2	1.3	0.6	0.8	0.8	0.8	0.5	0.6	0.4
Thailand	19.6	12.3	10.3	14.6	17.3	16.6	15.4	26.7	23.9
Viet Nam	1.5	1.6	2.3	2.9	11.7	16.2	12.8	4.8	7.7

Source: COMTRADE.

Table A.10. EU-15 and EU-27: volume of imports of FFV from selected ASEAN countries (tons)

A. EU-15: volume of imports of FFV from selected ASEAN countries, 2000-2005 (tons)

		2000	2001	2002	2003	2004	2005
Malaysia	Fruit and nuts	7 185	6 653	5 559	5 149	4 638	4 186
	Vegetables	50	57	157	265	91	563
	FFV	7 234	6 710	5 716	5 414	4 728	4 749
Thailand	Fruit and nuts	9 516	9 496	11 152	12 659	14 428	16 133
	Vegetables	12 771	15 072	14 236	13 310	13 949	17 247
	FFV	22 287	24 568	25 388	25 969	28 376	33 380
Viet Nam	Fruit	3 367	3 234	4 379	5 837	5 512	7 699
	Nuts	4 501	6 951	12 274	16 984	18 138	24 393
	Vegetables	4 484	4 448	4 373	5 100	5 397	5 062
	FFV	12 352	14 632	21 025	27 921	29 046	37 155

Source: European Commission Export Helpdesk.

B. EU-27: volume of imports of FFV from selected ASEAN countries, 2000-2006 (tons)

		2000	2001	2002	2003	2004	2005	2006
Malaysia	Fruit	5 191	4 634	4 133	3 920	4 041	3 845	3 536
	Nuts	3 962	3 013	2 426	2 112	886	653	554
	Vegetables	50	83	157	265	111	563	407
	FFV	9 203	7 730	6 716	6 297	5 038	5 061	4 497
Thailand	Fruit	10 081	10 303	11 550	12 148	13 901	15 706	18 455
	Nuts	1 198	987	1 023	1 133	1 444	1 374	1 524
	Vegetables	13 032	15 425	14 595	13 439	14 901	19 470	16 761
	FFV	24 311	26 716	27 168	26 719	30 246	36 550	36 741
Viet Nam	Fruit	3 842	3 684	4 692	6 246	5 865	7 999	9 072
	Nuts	4 521	7 043	12 755	17 574	18 627	25 657	24 734
	Vegetables	4 807	4 842	4 628	5 304	5 640	5 259	5 651
	FFV	13 170	15 569	22 075	29 124	30 132	38 915	39 457

Source: European Commission Export Helpdesk.

Table A.11. Malaysia: exports and imports of fresh and processed fruit and vegetables, 1997-2006

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
FFV	Exports (X) ($ m)	134.8	110.3	147.9	155.4	161.3	172.1	169.7	177.0	186.1	184.7
	Imports (M) ($ m)	429.3	327.2	365.8	354.6	382.6	406.1	397.5	475.5	533.8	591.3
	Trade balance ($ m)	-294.5	-217.0	-218.0	-199.2	-221.2	-234.0	-227.7	-298.4	-347.7	-406.6
	Export/Import ratio (per cent)	31.4	33.7	40.4	43.8	42.2	42.4	42.7	37.2	34.9	31.2
Fresh and processed fruit and vegetables	Exports (X) ($ m)	185.2	154.1	193.9	201.6	207.0	223.0	229.4	238.9	248.8	254.5
	Imports (M) ($ m)	491.7	364.7	419.7	415.6	449.3	469.2	463.8	550.3	615.7	684.0
	Trade balance ($ m)	-306.5	-210.6	-225.8	-214.1	-242.2	-246.2	-234.4	-311.4	-366.9	-429.5
	X/M ratio (per cent)	37.7	42.2	46.2	48.5	46.1	47.5	49.5	43.4	40.4	37.2

Source:COMTRADE.

Table A.12. Malaysia: area (ha) under cultivation for major fruit, 2000-2004

	2000	2001	2002	2003	2004
Durian	122 759	118 946	118 869	116 984	115 129
Banana	33 584	33 704	31 233	30 144	29 092
Rambutan	26 040	26 289	27 252	27 881	28 525
Dokong	18 498	18 829	20 300	21 275	22 297
Duku langsat	16 265	16 148	16 524	16 656	16 790
Pineapple	15 720	14 043	15 117	14 888	14 664
Cempedak	12 542	12 151	12 600	12 637	12 637
Mango	9 740	9 222	10 350	10 707	11 077
Mangosteen	8 150	8 058	7 557	7 989	8 447
Water melon	8 487	5 996	7 187	6 846	6 521
Sweet orange	6 276	6 956	6 621	6 821	7 027
Jackfruit	3 584	3 205	3 381	3 293	3 212
Pomelo	2 260	2 305	2 285	2 283	2 291
Papaya	2 257	2 202	2 125	2 062	2 001
Guava	1 809	1 642	2 076	2 255	2 449
Sapodilla (ciku)	1 354	1 297	1 189	1 115	1 045
Starfruit	1 244	1 203	1 018	923	837
Total	290 569	282 196	285 684	284 759	284 041

Source: Ministry of Agriculture and Agro-based Industries, Malaysia, *Agricultural Statistics Handbook 2004*.

Table A.13. Malaysia: area (ha) under cultivation for major vegetables, 2000-2004

	2000	2001	2002	2003	2004
Spinach	2 193	2 770	3 498	4 418	4 806
Cucumber	3 484	3 396	3 484	3 575	3 666
Chillies	3 264	2 900	3 263	3 670	3 958
Water spinach	2 236	2 699	433	448	4 245
Choysum	2 716	2 905	422	416	3 517
Lady's fingers (okra)	1 943	1 907	426	411	2 589
Brinjal	1 499	1 568	133	128	1 787
Pak Choy	1 519	1 285	69	58	1 942
Chinese kale	997	1 222	1 498	1 837	2 149
Cabbage	1 370	814	1 410	1 685	2 081
Lettuce	1 159	1 273	1 398	1 535	1 664
Tomato	951	628	950	1 439	1 554
Yam bean	663	327	662	1 343	1 143
Spring onion	439	417	439	462	465
Sweet shoot	418	404	418	433	448
Pumpkin	382	345	395	422	416
Radish	39	375	393	426	411
Cauliflower	114	98	114	133	128
Carrot	16	26	42	69	58
Total	25 402	25 359	29 603	34 609	37 027

Source: Ministry of Agriculture and Agro-based Industries, Malaysia, *Agricultural Statistics Handbook 2004.*