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**Research Report**

## Overview of the Sanitary and Phytosanitary Measures in QUAD Countries on Tropical Fruits and Vegetables Imported from Developing Countries

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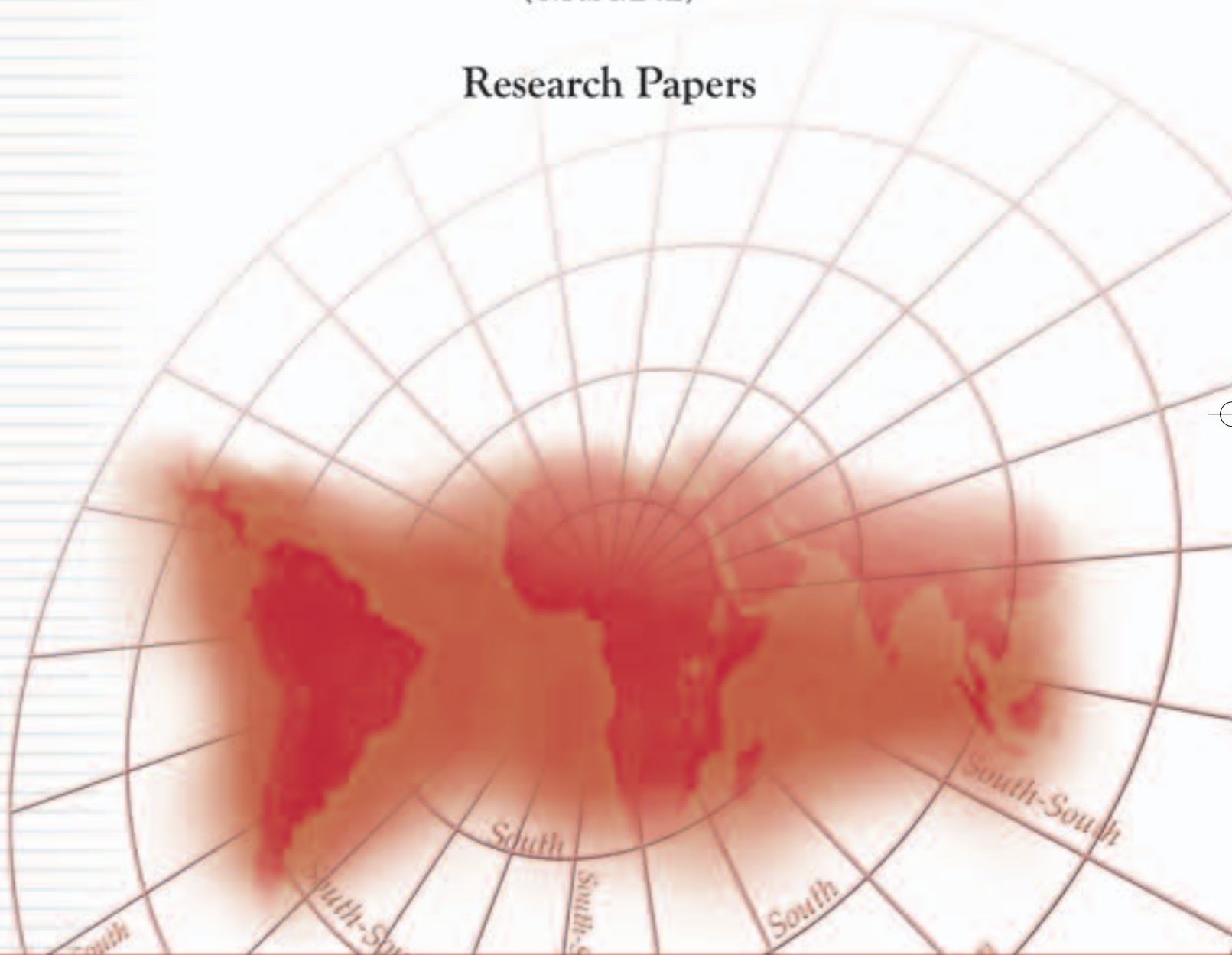
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Trade-Related Agenda  
Development and Equity  
(T.R.A.D.E)

Research Papers



Overview of the Sanitary and Phytosanitary  
Measures in QUAD Countries  
on Tropical Fruits and Vegetables  
Imported from Developing Countries

1

# **TRADE-RELATED AGENDA, DEVELOPMENT AND EQUITY (T.R.A.D.E.)**

## **RESEARCH PAPERS**

### **1**

#### **OVERVIEW OF THE SANITARY AND PHYTOSANITARY MEASURES IN QUAD COUNTRIES ON TROPICAL FRUITS AND VEGETABLES IMPORTED FROM DEVELOPING COUNTRIES**

This working paper was written by

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**SOUTH CENTRE**

**NOVEMBER 2005**

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## ACRONYMS

AAFC	Department of Agriculture and Agri – Food Canada
ACP	Africa, Caribbean and Pacific
APF	Agricultural Policy Framework (Canada)
APHIS	Animal and Plant Health Inspection Services
BSE	bovine spongiform encephalopathy
CDC	Centre for Disease Control and Prevention
CFIA	Canadian Food Inspection Agency
CFIS	Blueprint Document for the Canadian Food Inspection System
CFSAN	Centre for Food Safety and Applied Nutrition
CIAT	Centro Internacional de Agricultura Tropical (Columbia)
CHPA	Canada Health Protection Act
COLEACP	Europe-Africa- Caribbean Pacific Liaison Committee
EFSA	European Food Safety Authority
EPA	Environmental Protection Agency (US)
FDA	Food and Drugs Act (Canada)
FDA	Food and Drug Administration (US)
FSC	Food Safety Committee
GAP	good agricultural practices
GATT	General Agreement on Tariff and Trade
GDP	Gross Domestic Product
GSR	General Safety Requirements
HACCP	Hazard Analysis Critical Control Points
HC	Health Canada
IPPC	International Plant Protection Convention
KEPHIS	Kenyan Plant Health Inspectors Service
LOD	limit of determination
LDCs	Least Developed Countries
MAFF	Ministry of Agriculture, Forestry and Fisheries (Japan)
MFN	Most Favoured Nation
MHLW	Ministry of Health, Labour and Welfare (Japan)
MRLs	maximum residue level
OIE	International Office of Epizootics
PCPA	Pest Control Product Act (Canada)
PIP	Pesticides Initiative Programme
PMRA	Pest Management Regulatory Agency
PPA	Plant Protection Act (US)
PRAs	Plant Pest Risk Assessments
QUAD	Canada, the European Union, Japan, and the United States
SPS	Sanitary and Phytosanitary (measures)
TBT	Technical Barrier to Trade
USDA	United States Department of Agriculture

## **Organizations**

FAO	Food and Agricultural Organization
OECD	Organisation for Economic Cooperation and Development
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization



## EXECUTIVE SUMMARY

### **i. Scope and Objectives**

The unitary values of many traditional agricultural export crops have decreased steadily over the past decade, highlighting the risks involved for developing countries in depending upon a narrow product base for earning foreign exchange through exports. Conversely, unitary export values for tropical fruits and vegetables have held up fairly well over the past decade, suggesting that exports of these products may represent a valuable alternative to exports of traditional agricultural products for developing countries wishing to maintain or expand their agricultural export revenues. Trade analysts expect the strong upward trend in exports of tropical fruits and vegetables from developing countries witnessed over the course of the past two decades to continue in the medium term. Imports into the QUAD countries, which today represent over three fifths of worldwide imports of these products, are expected to continue to expand as consumers look for 'new' and 'exotic' foods.

Although tariff barriers to worldwide imports of agricultural and non - agricultural goods are being gradually dismantled as a result of successive trade liberalization rounds under the umbrella of the World Trade Organization (WTO), concerns are mounting that this is being accompanied by a parallel rise in the use of non - tariff barriers to imports, and particularly sanitary and phytosanitary (SPS) and technical (technical barriers to trade or TBT) measures.

To the extent that countries have the right to protect human, animal and plant life or health in their territories and to ensure that imported goods meet certain technical requirements, these measures are both morally and legally justifiable. Therefore, every country has the right to impose, and indeed imposes, SPS measures. To ensure that these measures are not used as disguised restrictions to trade or, in a manner that is discriminatory, arbitrary or unjustifiable, GATT member countries adopted an Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) when establishing the rules of the WTO in 1995. A growing body of literature discusses the extent to which developing countries can exploit the provisions of, and the mechanisms created by the SPS Agreement, to ensure continued market access to developed countries' markets. This paper attempts to contribute to this debate.

### **ii. Main Findings**

#### *The importance of tropical fruits and vegetables for developing countries*

Contrary to the worldwide production of tropical fruits and vegetables, the volume of tropical fruits and vegetables traded worldwide has increased considerably over the course of the past two decades. From 1985 to 1995, worldwide trade in these products increased by 4 per cent annually. This growth rate increased to 7 per cent for the period 1995 – 2000 and to 14 per cent for the period 2000 – 2003. Meanwhile, the production of tropical fruits and vegetables increased by an average annual growth rate of 0.9 per cent during the period 1995 – 2000, and fell by 1 per cent from 2000 to 2003. Over the period 1990 - 2003, developing countries accounted for roughly 98 per cent of worldwide production of tropical fruits and vegetables. They maintained a constant share in the value of world exports of tropical fruits and vegetables of 63 per cent over the period, while export revenues increased from US\$380 million in 1990 to US\$1.47 billion in 2003. The participation of Least Developed Countries (LDCs) is marginal in comparison with overall exports from developing countries. Meanwhile, the QUAD countries (Canada, the EU, Japan, and the United States) represent roughly 66 per cent of

worldwide imports of tropical fruits and vegetables, importing US\$1.9 billion worth of these products in 2003. This illustrates that changes in import requirements in these countries may have an important impact upon exports of tropical fruits and vegetables from developing countries.

#### *SPS requirements imposed by QUAD countries upon imported tropical fruits and vegetables*

As the demand for better food safety increases with growing consumer affluence and, in reaction to a number of highly publicised food safety crises, sanitary and phytosanitary standards, and especially food safety standards, in QUAD country markets are becoming increasingly stringent. Over the course of the past decade, QUAD countries have adopted an integrated approach to food safety on the basis of the farm-to-table principle, according to which food safety measures must be implemented at each stage of the food supply chain. QUAD governments are shifting the responsibility for the safety of their nations' food supply from public food safety authorities to private food business operators, who are increasingly held responsible for the safety of the foodstuffs they place on the market. As a result, food business operators are increasingly imposing food safety requirements upon their suppliers in foreign countries in an effort to eliminate as many food safety risks as possible.

Food safety authorities in QUAD countries are increasingly concerned about the impact upon human health of residues of active substances in and on foodstuffs, resulting in the development of ever more restrictive legislation in the field of plant protection products. As a result of stringent and costly registration and authorization procedures, the number of active substances authorized for use on foodstuffs consumed in the QUAD countries has decreased, while maximum residue levels (MRLs) are increasingly set at lower levels, making it ever more difficult for developing country suppliers to comply with these standards. The ongoing efforts of the EU to evaluate the safety of active substances in plant protection products and harmonize MRLs for example, have given rise to growing concerns that developing countries will be effectively prohibited from exporting fruits and vegetables to the EU or, that compliance costs will be so high that entrance into the European market will be restricted to a limited number of larger export growers.

#### *The SPS Agreement and its significance for developing countries*

Although the WTO Agreement on Sanitary and Phytosanitary Measures provides an international framework to ensure that plant health and food safety requirements are not more trade restricting than strictly necessary to protect human and plant health, a growing body of literature highlights the difficulties of developing countries to participate in the mechanisms developed by the Agreement. As a result, developing countries not only fail to fully exploit the potential opportunities created by the Agreement, but also become alienated from mainstream debates, especially with regard to standard setting activities. These difficulties are magnified by the intrinsic complexities of managing food safety and animal and plant health within fast evolving international agricultural trade patterns. Meanwhile, the number of SPS notifications submitted by QUAD countries - relating to fruits and vegetables in general and to tropical fruits and vegetables in particular - has increased consistently throughout the years, confirming the view that QUAD countries' activity in the field of food safety has intensified. Unfortunately, the bulk of the notifications submitted by QUAD countries are not harmonized, i.e. not based on internationally agreed standards.

### **iii. Conclusions and Recommendations**

The proliferation and increasing stringency of food safety and plant health requirements imposed by developed countries have led to growing concerns amongst many developing countries as to their administrative, technical and financial capacities to comply with these requirements and consequently maintain their access to export markets. While evidence suggests that the benefits of complying with SPS requirements seem to outweigh costs for developing countries as a group, these costs and benefits

may be distributed unevenly between countries and, between operators within countries. At the international level, concerns are that lower income countries with limited financial, human and technical resources may be unable to comply with SPS requirements imposed by developed countries, and thus be marginalized in international trade. At the national level, smaller exporters and smallholder farmers may be unable to comply with increasingly stringent SPS requirements due to their limited financial resources, and thus be excluded from export supply chains. Evidence illustrates that public policy can be decisive in determining whether growers lose or gain from SPS compliance.

In certain circumstances, SPS requirements may function as a 'catalyst' for competitive repositioning and enhanced export performance of developing countries. The transformation of Kenyan horticultural exports to the EU, which started in the second half of the 90s, illustrates that developing countries with limited resources can develop the regulatory and administrative framework to comply with public and private SPS requirements in developed country markets and, even turn them into a competitive advantage in supplying precisely those market segments that are most demanding in terms of food quality and security. Recent experiences have shown that it is of primordial importance for public authorities to engage in an open dialogue and to cooperate with the private sector. Indeed, since they are well informed about technical capacities and constraints, private operators can make an important contribution towards the identification of deficiencies in the sector's capacity to meet export markets' SPS requirements and the development of appropriate actions to remedy these deficiencies.



## INTRODUCTION

A number of developing countries,<sup>1</sup> and especially least developed countries (LDCs), rely on agriculture for their food security, export earnings and rural development. It has been estimated that the agricultural sector accounts for between 30 per cent and 60 per cent of gross domestic product (GDP) for many of these countries, and is the major source of foreign exchange. The Food and Agriculture Organization of the United Nations (FAO) (2002) noted that the economies of many developing countries depend on the exports of one or a few commodity exports, making them particularly vulnerable to price variations on specific commodities. It noted that single commodity-dependence is more pronounced in tropical regions, and notably so for specific tropical products including sugar, coffee, bananas, cotton lint and cocoa beans. The variability and decline of commodity prices is well documented (FAO, 2005). It erodes the competitiveness of commodities exported from non-subsidizing developing countries, discourages investment and expansion of their food exporting sectors and, in the event that developing countries depend heavily on agricultural exports, worsen their terms of trade.

According to the FAO's *State of Agricultural Commodity Markets* (2005), the variability and decline in international agricultural commodity prices has serious implications for developing countries that are highly dependent on commodity export earnings, especially from traditional tropical crops. Since tariff escalation in agricultural markets is regarded as one of the major factors hindering the processing of traditional products for export, analysts have explored the potential for exporting non - traditional fresh fruits and vegetables to QUAD countries (Canada, the EU, Japan and the United States). These are valid alternatives because first, tropical fruits and vegetables are not usually cultivated in QUAD countries and therefore, their trade is not distorted by domestic producer support measures. Secondly, consumer tastes in QUAD countries are diversifying into 'exotic' tropical fruits and vegetables. The FAO for example, is currently helping market players to develop international trade for organic mangoes and pineapples produced in Sub-Saharan Africa.

Effective market access in sectors of export interest for developing countries is fundamental for the development of these opportunities. Although tariff barriers in goods, particularly in agriculture, are being progressively lowered or eliminated, there is a perception that this has been accompanied by recurrent and increasing use of non-tariff barriers, particularly sanitary and phytosanitary (SPS) and technical (technical barriers to trade or TBT) measures. There is a fear that these are affecting the efficacy and actual usability of market access opportunities that have been secured through Most Favoured-Nation (MFN) and the preferential reduction of tariff barriers.

The rest of this paper is organized as follows: Section I describes world trade in tropical fresh fruits and vegetables and its importance for developing countries. Section II presents an overview of the actual SPS measures in the QUAD countries concerning tropical fruits and vegetables, and analyses their changing pattern over time. Section III describes the main features of the SPS Agreement, its significance for developing countries in terms of their capacity to implement its provisions, and changing patterns in notifications of SPS measures on tropical fruits and vegetables by QUAD countries. Section IV analyses the costs and benefits for developing countries and private operators of compliance with SPS requirements, and attempts to put forward a number of recommendations. Section V concludes.

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<sup>1</sup> According to FAO classification



# I. THE IMPORTANCE OF TROPICAL FRUITS AND VEGETABLES FOR DEVELOPING COUNTRIES

## I.1 Tropical Fruits and Vegetables: Defined

The dynamic nature of world production and trade on fruits and vegetables is well documented elsewhere (Diop and Jaffee, 2004). This report therefore focuses on fruits and vegetables cultivated in the tropics. Although the statistics on tropical fruits and vegetables tend to be dominated by bananas, this product is not included in this research because its production, trade and policy changes are already closely monitored by international commodity bodies within the FAO.<sup>2</sup> For the purpose of this paper, the category of products defined as 'tropical fruits' includes mangoes, pineapples, papayas, avocados and minor tropical fruits (see below).<sup>3</sup> The only 'tropical vegetable' taken into account in this study is sweet potato, as this is the only tropical vegetable traded internationally in significant volumes. Many root or tuber vegetables, including cassava, yam and coco yam (taro) are staple commodities in developing countries. However, they are not imported in significant volumes into the QUAD countries, and their consumption is limited to ethnic minority groups.

The report distinguishes between production and trade, as the largest producers of tropical fruits and vegetables are not necessarily the largest exporters.

## I.2 Production

World production of tropical fruits stood at 66.4 million tonnes in 2003, a 46 per cent increase relative to 1990, when production stood at 45.5 million tonnes. Production is highly concentrated in developing countries, which marginally increased their share in world production from 97 per cent in 1990 to 98 per cent in 2003. Mangoes are the most important tropical fruits in terms of production, accounting for 40 per cent (25.9 million tonnes) of world production of tropical fruits in 2003. They are followed by pineapples which account for 22 per cent (14.6 million tonnes), papayas for 10 per cent (6.4 million tonnes) and avocados for 6.4 per cent (2.6 million tonnes). These four fruits, which together accounted for 76 per cent of the developing world's tropical fruit output in 2003, are commonly referred to as *major* tropical fruits (FAO, 2003a). Other tropical fruits produced in smaller volumes, including *inter alia* durians, guavas, rambutans, carambolas, cherimoyas, jackfruits, longans and passion fruits, are referred to as *minor* tropical fruits. The group of minor tropical fruits comprises a wide variety of fruit types, traded in smaller volumes and mostly at a regional level. International trade statistics generally do not distinguish between these 'minor' fruit varieties (FAO, 2003a). The share of individual tropical fruits in the overall production of tropical fruits in the developing world has remained stable from 1990 to 2003.

Nearly three quarters of the developing world's mangoes, or 19.3 million tonnes, are produced in Asia (2003 figures). India is by far the largest producer accounting for 42 per cent, followed by China with 13 per cent. Latin America accounts for 15 per cent of the developing world's production of mangoes, where the largest producer is Mexico with 1.5 million tonnes. Africa produces close to ten per cent of the developing world's mangoes (2.6 million tonnes), and the region's largest producer is Nigeria with 730 000 tonnes.

With a total of 14.6 million tonnes, Asia produces over half of the developing world's production of pineapples (2003 figures). The region's largest producing countries are Thailand, the Philippines and China,

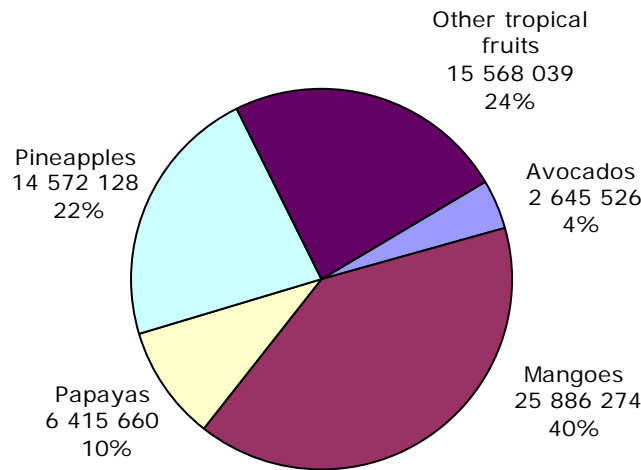
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<sup>2</sup> A Sub-Group on Tropical Fruits also exists within the Intergovernmental Group on Bananas and Tropical Fruits.

<sup>3</sup> The same categorization is used by FAO (see e.g. FAO, 2003)

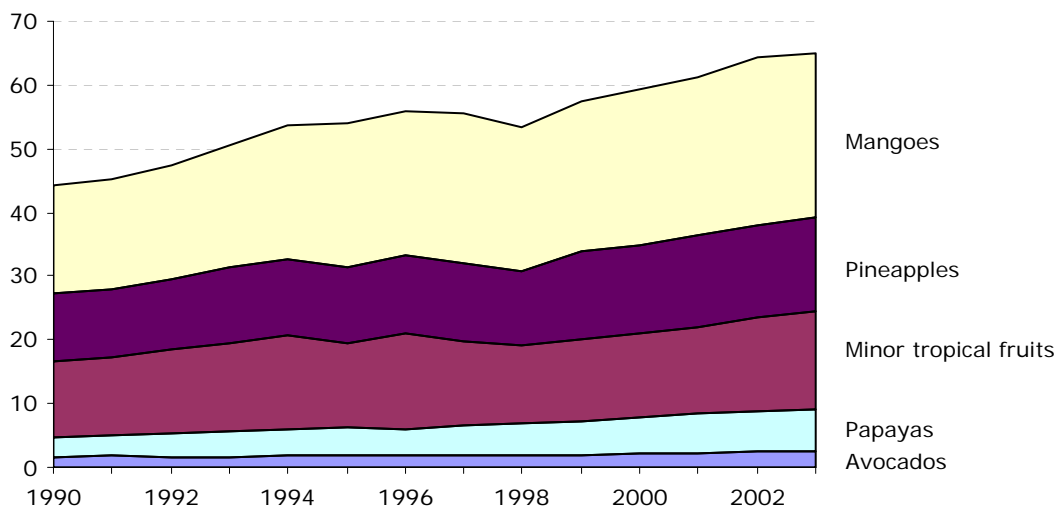
each accounting for about one tenth of the developing world's pineapple production. Latin America produced 30 per cent, or 4.5 million tonnes. Brazil has a large share in the region with a total production of 1.3 million tonnes, followed by Costa Rica (725 000 tonnes) and Mexico (721 000 tonnes). Finally, Africa produces 17 per cent (2.5 million tonnes), of the developing world's pineapples. Nigeria is the largest producer with 890 000 tonnes in 2004, followed by Kenya, Cote d'Ivoire, and Congo.

Figure 1: World production of tropical fruits, in tonnes (2003)



Source: computed from FAOSTAT

Figure 2: Evolution of world production of tropical fruits (1990-2002) (in million tonnes)



Source: computed from FAOSTAT



Over half of the developing world's papayas, or 3.3 million tonnes, are produced in Latin America (2003 figures). Brazil alone accounts for one quarter of the developing world's production of the fruit, or 1.6 million tonnes. Other important producers in the region include Mexico, Peru, Venezuela, Cuba and Colombia. Asia accounts for approximately 28 per cent of the world's production of papayas, or 1.8 million tonnes, with 72 per cent originating in India and Indonesia alone. Africa produces less than one fifth of all papayas, where the region's leader is Nigeria (755 000 tonnes in 2003), followed by Ethiopia and Congo.

Over three quarters of the developing world's avocados are produced in Latin America (2003 figures). Mexico alone produces one million tonnes, or 38 per cent of Latin America's production, followed at a distance by Brazil, Colombia, the Dominican Republic, Chile and Peru. Asia accounts for slightly over 14 per cent of the developing world's production of avocados, with Indonesia being by far the region's largest producer. Africa produces close to 10 per cent of the developing world's avocados, where Ethiopia, Congo and Cameroon are the region's largest producers. Avocados are the only tropical fruits that are produced in substantial quantities in developed countries. In 2003, ten per cent of the world's avocado crop was produced in the United States and Spain.

The vast majority of the minor tropical fruits (82 per cent) are produced by developing countries in Asia. (2003 figures). The Philippines, Indonesia, India and China dominate production in the region, with a combined output of 11 million tonnes. Latin America produces 14 per cent of the developing world's production, where the leader is Colombia. Other important producers in the region are Brazil, Mexico and Peru. Finally, Africa's most important producers include Madagascar, Tunisia, Zambia, Tanzania, Guinea and Kenya, whose combined output represents 3.2 per cent of the developing world's production of minor tropical fruits.

The developing world's output of sweet potatoes stood at 123.6 million tonnes in 2003, out of which nearly 90 per cent was produced in Asia. China alone produced 103.8 million tonnes, or 84 per cent of the developing world's total. Africa accounted for 8.6 per cent of developing countries' total production of sweet potatoes, or 10.7 million tonnes. By far the region's largest producers are Uganda and Nigeria, followed by Tanzania, Rwanda, Burundi and Kenya. Latin America's contribution to the developing world's output of sweet potatoes is minimal, the region accounting for only 1.6 per cent of world production.

### **I. 3 Exports and Imports**

#### ***I. 3.1 World Exports***

Contrary to the worldwide production of tropical fruits and vegetables, the volume of tropical fruits and vegetables traded worldwide has increased considerably over the course of the past two decades (see Table 1). From 1985 to 1995, worldwide trade in these products increased by 4 per cent annually. This growth rate increased to 7 per cent for the period 1995 – 2000 and to 14 per cent for the period 2000 – 2003. These figures compare with an average annual growth rate for the production of tropical fruits and vegetables of 0.9 per cent for the period 1995 – 2000, and 1 per cent for the period 2000 – 2003. The traded volumes of all tropical fruits and vegetables increased over the period 1985 – 2003, with the exception of sweet potatoes, for which positive growth rates were registered only from 2000 to 2003. Two – digit growth was registered from 1985 to 2003 for mangoes and papayas, and from 2000 to 2003 for mangoes, papayas, pineapples and minor tropical fruits.

**Table 1**  
**Annual growth rates of world exports of tropical fruits and**  
**vegetables in volume terms**  
*(per cent per annum)*

Product	1985-1995	1995-2000	2000-2003
Avocados	8	8	5
Mangoes	11	13	14
Papayas	18	11	12
Pineapples	5	6	15
Sweet Potatoes	-11	-8	4
Other trop	6	5	29
<b>TOTAL TROP F &amp; V</b>	<b>4</b>	<b>7</b>	<b>14</b>

*Source: computed from FAOSTAT*

Table 2 shows growth rates for world trade of tropical fruits and vegetables in value terms. A comparative analysis of Tables 1 and 2 indicates that from 2000 to 2003, unit prices increased for all tropical fruits and vegetables, with the exception of pineapples, for which trade in volume terms increased more rapidly than trade in value terms. Conversely, the increase in unit values for sweet potatoes fully compensated for the decrease in traded volumes, as exports of this product in value terms show exclusively positive growth rates. Overall, the analysis of both tables illustrates that unit values for tropical fruits and vegetables have held up fairly well over the past two decades.

**Table 2**  
**Annual growth rates of world exports of tropical fruits**  
**and vegetables in value terms**  
*(per cent per annum)*

Product	1985-1995	1995-2000	2000-2003
Avocados	22	11	13
Mangoes	9	7	20
Papayas	7	7	28
Pineapples	19	5	11
Sweet potatoes	0.3	5	13
Other trop	13	1	23
<b>TOTAL TROP F &amp; V</b>	<b>11</b>	<b>6</b>	<b>20</b>

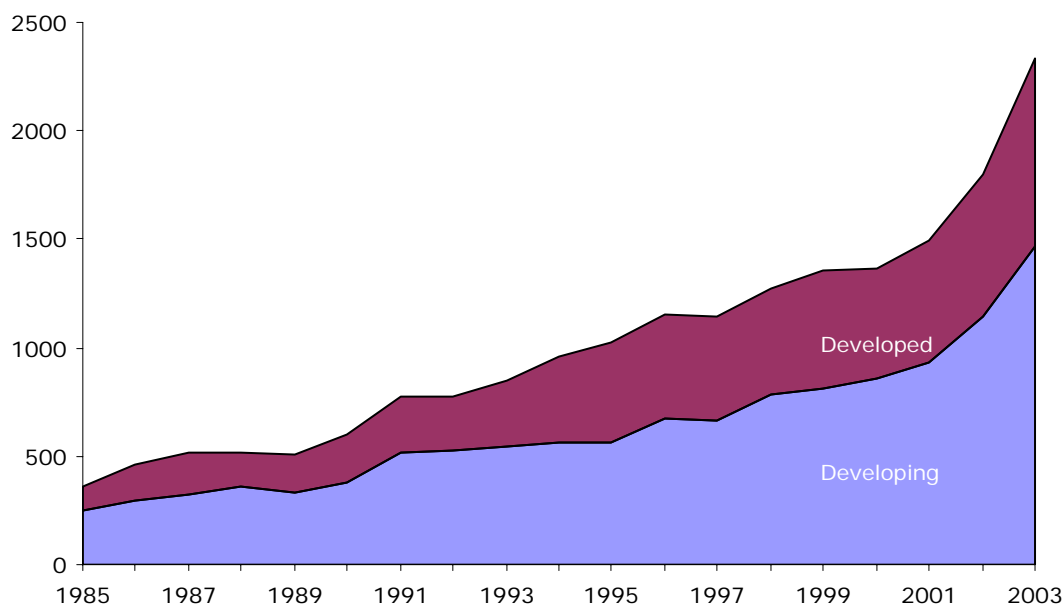
*Source: computed from FAOSTAT*

The remainder of this study concentrates on export revenues, as the value generated by these products is more representative of their contribution to the economies of developing countries than the actual volumes exported. Exports are valuable to countries not only for the externalities they generate inside economies, such as employment,<sup>4</sup> but also because they bring foreign exchange to buy imports. Another reason for concentrating on export values is that an increase in export volumes does not necessarily translate into an equally proportional increase in revenues. This question is further explored on p. 16.

### *1.3.2 Exports from Developing Countries*

Statistics indicate that developing countries maintained a constant share in the value of world exports of tropical fruits and vegetables of 63 per cent from 1990 to 2003, while export revenues increased from US\$380 million in 1990 to US\$1.47 billion in 2003.<sup>5</sup> The participation of LDCs is marginal in comparison with overall exports from developing countries. In 2003, exports of tropical fruits and vegetables from LDCs amounted to US\$22 million or 0.9 per cent of world export in value terms.

*Figure 3: Evolution of the value of exports of tropical fruits and vegetables from developed and developing countries (in US\$ millions)*



Source: FAOSTAT

Three fruits – mangoes, pineapples and avocados – account for 80 per cent of developing countries' total export revenues for tropical fruits and vegetables (see Table 3). Developing countries exported US\$440 million worth of mangoes, US\$426 million of pineapples and US\$313 million of avocados. Growth rates for exports of these three fruits over the past decade have been remarkable by any agricultural product standard. More recently, from 2000 to 2003, the export revenues of pineapples increased by an average annual growth rate of 21 per cent, mangoes by 11 per cent and avocados by a staggering 32 per cent (see Table 4).

<sup>4</sup> According to CIAT (2001), the production of tropical fruits is labour intensive and can provide steady employment and income, even for families with small parcels of land.

<sup>5</sup> The statistics of developed countries are an approximation because of re-exports.

**Table 3**  
**Relative weight of individual tropical fruits and vegetables in developing countries**  
**(per cent of total export revenues from tropical fruits and vegetables)**

<b>Product</b>	<b>1985-90</b>	<b>1995-2000</b>	<b>2000-03</b>
Avocados	4	13	20
Mangoes	21	40	31
Papayas	3	9	9
Pineapples	43	30	28
Sweet potatoes	17	2	2
Other trop	12	7	10
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>
Value per annum *	323 400	724 524	1 179 584

\* US\$ million, average

Source: computed from FAOSTAT

**Table 4**  
**Annual growth rates for developing country export revenues**  
**from tropical fruits and vegetables**  
*(per cent)*

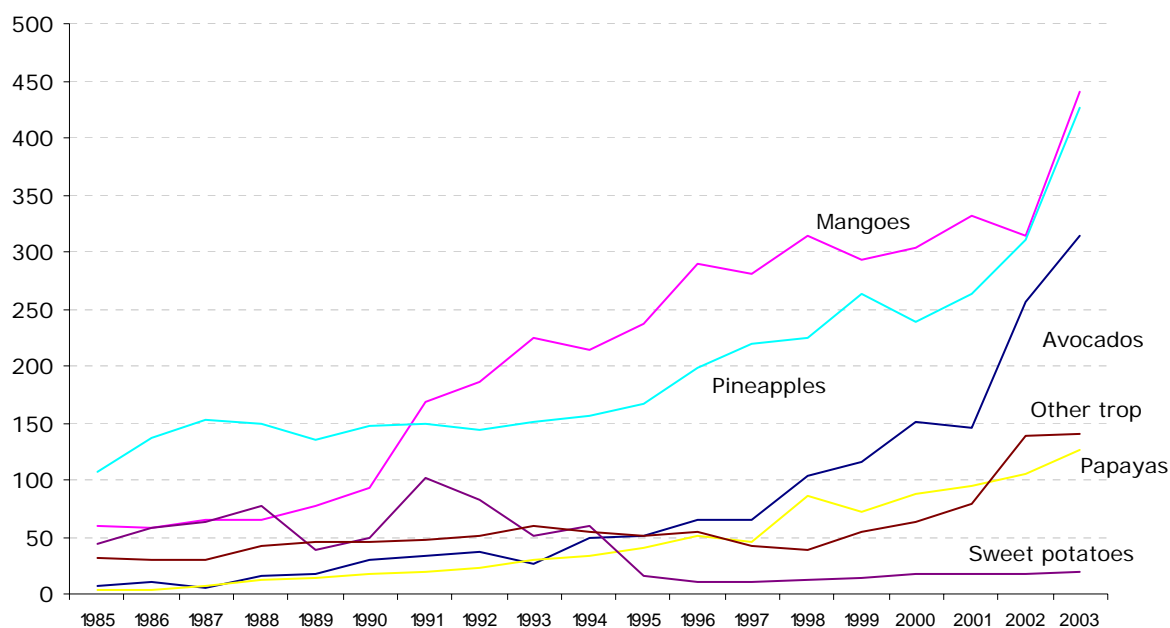
<b>Product</b>	<b>1985-95</b>	<b>1995-2000</b>	<b>2000-03</b>
Avocados	24.6	24.7	31.8
Mangoes	18.7	4.0	11.3
Papayas	28.0	16.8	13.2
Pineapples	2.5	7.8	21.0
Sweet potatoes	-4.1	4.5	2.1
Other trop	7.0	2.7	34.6
<b>TOTAL</b>	<b>8.9</b>	<b>8.5</b>	<b>19.8</b>

Source: computed from FAOSTAT

Exports of avocados have grown strongly and consistently in the last 20 years, and particularly fast in recent years. Their contribution to export revenues within this category of products increased from 4 per cent in the late eighties to 20 per cent in recent years. Pineapples used to dominate the income of this category of products in the late eighties, with a share of more than 40 per cent. However, they expanded slowly in the late eighties and lost some ground to more dynamic commodities like avocados and papayas. Nevertheless, they have been consistently gathering speed throughout the years and their current rate of growth of 21 per cent per annum guarantees them a significant position during this decade. Mangoes have shown an erratic behaviour, but their consistent growth has given them a significant presence within this group. The growth of other tropical fruits has also been erratic, but quite remarkable in the last three years (35 per cent). Finally, the fast expansion of export revenues from papaya by developing countries observed during the late eighties appears to be slowing down, decreasing from 28 per cent in 1985-1995 to 13 per cent in 2000-2003. Nevertheless, the two figure rates of growth experienced since the late eighties has given them an increasing importance within this category of products, where its contribution to export revenues has grown to close to 10 per cent in recent years.

Contrary to the situation on the production side, where tropical vegetables are far more important than tropical fruits, international trade in tropical vegetables is negligible in comparison with that in tropical fruits. Sweet potato is the only variety exported from developing countries in significant quantities. However, exports of this vegetable from developing countries fell by 58 per cent over the past decade, from US\$45.2 million in 1990 to a mere US\$19 million in 2003. In fact, what is particularly remarkable in the above tables is the consistent demise of sweet potato exports in the last few years.

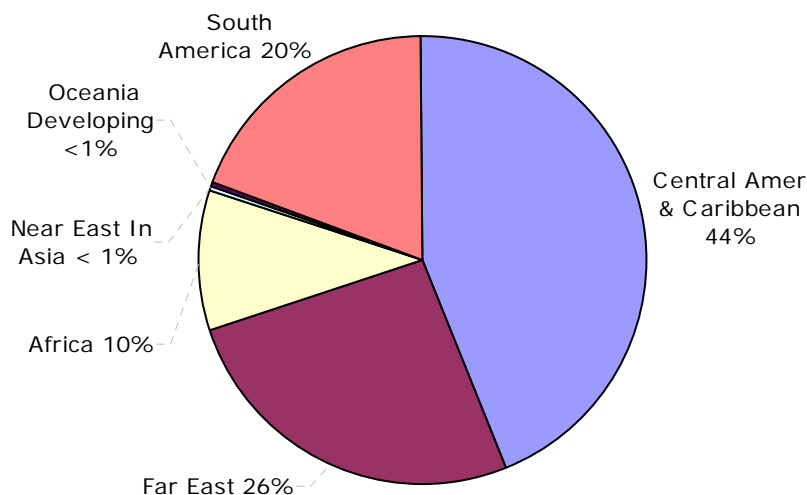
Figure 4: Evolution of export value of tropical fruits and vegetables in developing countries (in US\$000)



Source: FAOSTAT

Central America (including Mexico) and the Caribbean captured 44 per cent, or US\$641.9 million, of all export revenues of tropical fruits and vegetables from developing countries in 2003, followed by the Asia with 26 per cent (US\$379.9 million), South America with 20 per cent (US\$286.9 million) and Africa with 10 per cent (US\$149.8 million) (see Figure 6, figures for 2003). Remarkably, those regions which capture large shares of the world market for tropical fruits and vegetables are not necessarily the largest producers of these products. Central America and the Caribbean, which are by far the largest exporting regions, represent only 4 per cent of worldwide production of tropical fruits and vegetables, while Asia, producing 81 per cent of the world's tropical fruits and vegetables, accounts for only a quarter of worldwide trade in these products. South America, representing one fifth of worldwide exports, produces only 5 per cent of all tropical fruits and vegetables produced worldwide, while Africa accounts for roughly one tenth of both production and exports of these products.

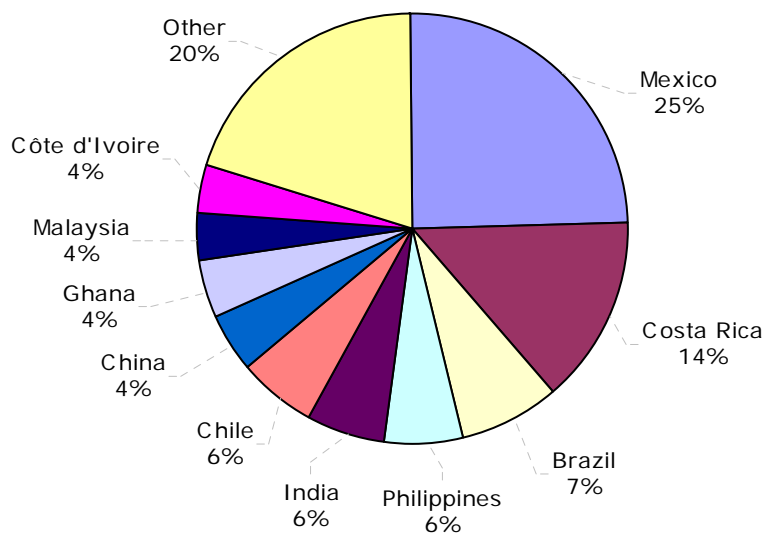
Figure 5: Share of export revenues from tropical fruits and vegetables by region (2003)



Source: FAOSTAT

Looking at individual countries, the statistics show that export trade in tropical fruits and vegetables in developing countries is highly concentrated (see Figure 6). Three countries – Mexico, Costa Rica and Brazil – accounted for 46 per cent (US\$676 million) of all exports of tropical fruits and vegetables from developing countries in 2003. Of these three countries, Mexico is by far the largest exporter, capturing 25 per cent (US\$364 million) of total export revenues in 2003. Exports from Mexico have increased rapidly over the past decade, rising from just over US\$100 million in the early 90s to over US\$346 million in 2003. However, the country’s relative share of the world market for tropical fruits and vegetables is declining, from nearly 50 per cent in 1998 to roughly 25 per cent in 2003. Conversely, Costa Rica and Brazil are increasing their shares of the world market. Costa Rica, the world’s second largest exporter, saw an increase from US\$41 million in 1993 to US\$203 million in 2003. Other important exporters include the Philippines (US\$88 million), India (US\$87 million), Chile (US\$86 million), China (US\$65 million), Ghana (US\$63 million), Malaysia (US\$60 million), and Côte d’Ivoire (US\$53 million). Together, these ten countries accounted for nearly 80 per cent of all exports of tropical fruits and vegetables from developing countries in 2003.

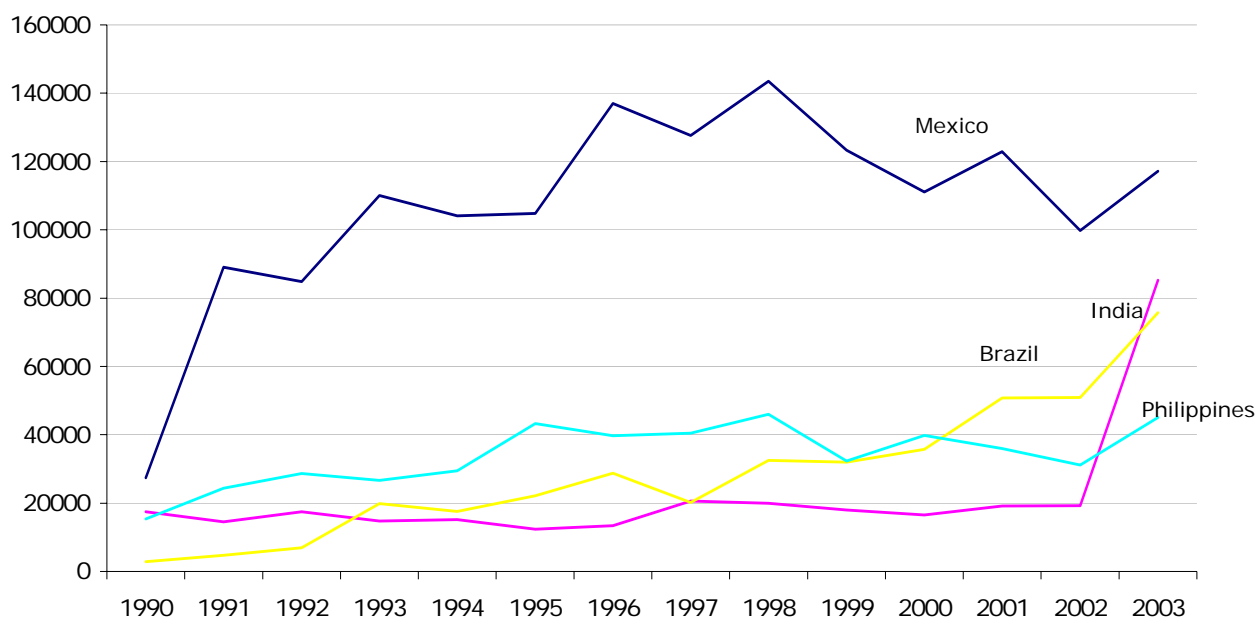
Figure 6: Share of export revenues from tropical fruits and vegetables in developing countries (2003)



Source: FAOSTAT

Mexico is the world's largest exporter of mangoes, and in 2003 its export revenues stood at US\$117 million. However, since 2000 Mexico's dominant position during the 90s, when the country captured well over half of all mango export revenues, has been progressively being eroded, and by 2003 its share had fallen to 27 per cent. Major competitors include India and Brazil, which in 2003 accounted for 19 and 17 per cent respectively of the export revenues from these products. Remarkably, Ecuador, which did not export any mangoes in the early 90s, had become the developing world's seventh largest exporter by 2003 (see Figure 7).

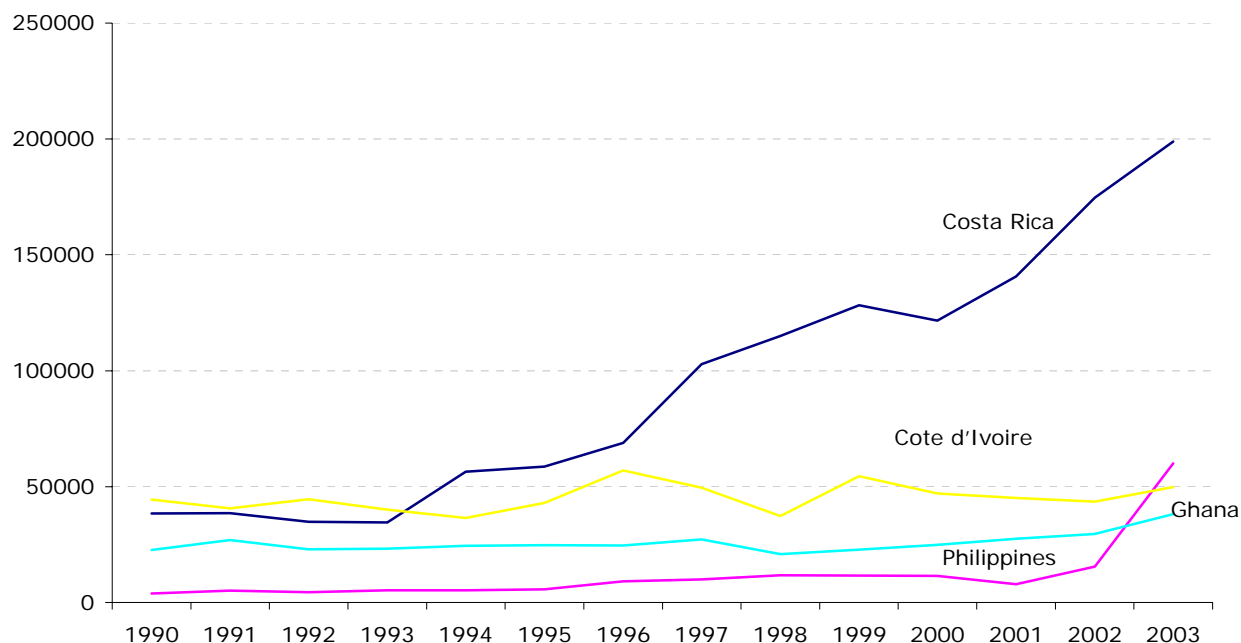
Figure 7: Mango export revenues of leading developing countries (1990-2003) (inUS\$ 000 )



Source: FAOSTAT

Costa Rica's expansion of pineapple exports has been remarkable by all standards and today it is the dominant country, accounting for almost half of all pineapple exports (US\$199 million in 2003). Its share in 1990 was 26 per cent, already dominant but shared with Cote d'Ivoire. The latter, a leading exporter in the late eighties saw its participation fall to 12 per cent by 2003. The remarkable expansion of Costa Rica has masked growth in other countries. For example, while both Honduras and Ecuador increased their pineapple exports in absolute terms over the period, their relative importance in overall exports from developing countries fell from 11 to 6 per cent and from 15 to 9 per cent respectively (see Figure 8).

Figure 8: Pineapple export revenues captured by leading developing countries (1990-2003) (in US\$000 )



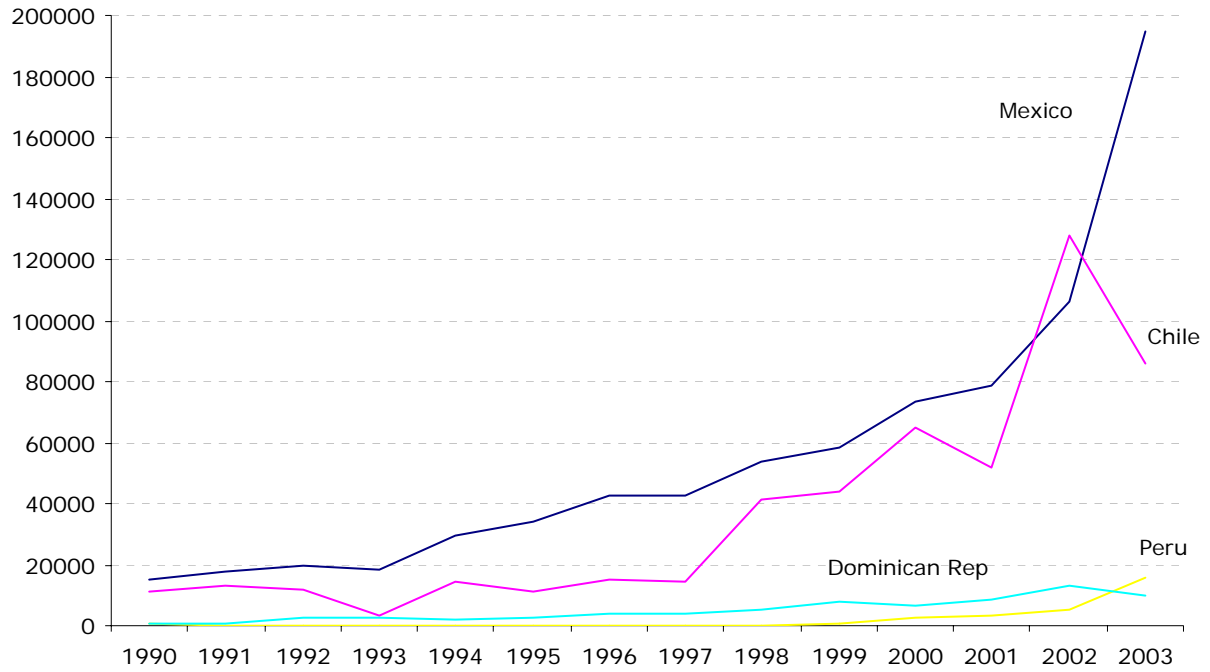
Source: FAOSTAT

Exports of avocados are highly concentrated, with 98 per cent of all exports by developing countries originating from just four Latin American countries: Mexico, Chile, Peru and the Dominican Republic. Mexico is by far the largest exporter of the group, with US\$195 million or 62 per cent of all exports in 2003. All four countries saw their avocado exports increase considerably from 1990 to 2003, by an average annual growth rate of 23 per cent in the case of Chile, 22 per cent in the case of the Dominican Republic, 19 per cent in the case of Mexico and 71 per cent in the case of Peru. This latter country increased its exports from negligible levels in the late 90s to US\$16 million in 2003, thereby becoming the world's third largest exporter of the fruit. Meanwhile, Africa's main avocado exporters, Zimbabwe and Morocco, together account for less than one per cent of all avocado exports from developing countries.

Three developing countries – Mexico, Brazil and Malaysia – accounted for 79 per cent or US\$100 million of the developing world's papaya exports in 2003. There have been some changes in the relative position of exporters since 1990. Today, Mexico alone earns one third of all export revenues of developing countries, up from just 4 per cent in 1990. Meanwhile, Malaysia, by far the world's largest exporter of papayas in the early 90s, ranked third by 2003, overtaken not only by Mexico but also by Brazil, which steadily increased its exports from US\$2 million in 1990 to US\$29 million in 2003. Other developing countries, including Ghana, the Philippines, the Dominican Republic and Ecuador, have considerably increased their papaya exports over the period, but still play only a secondary role in the overall papaya export trade from developing countries. Noticeably, papaya exports from Jamaica, which ranked as the developing world's third largest exporter in the mid-90s with annual exports amounting to almost US\$6.7 million, fell to less than half that level by 2003.

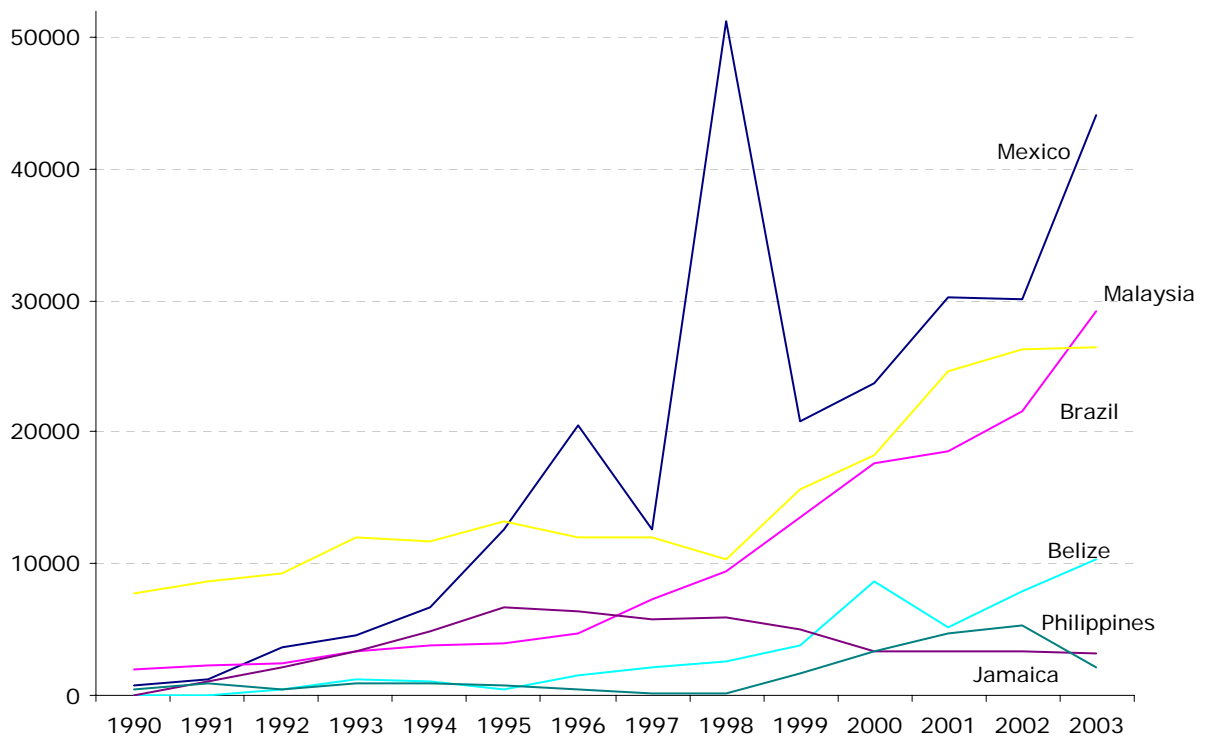


Figure 9: Avocado export revenues of leading developing countries (1990-2003) (in US\$000 )



Source: FAOSTAT

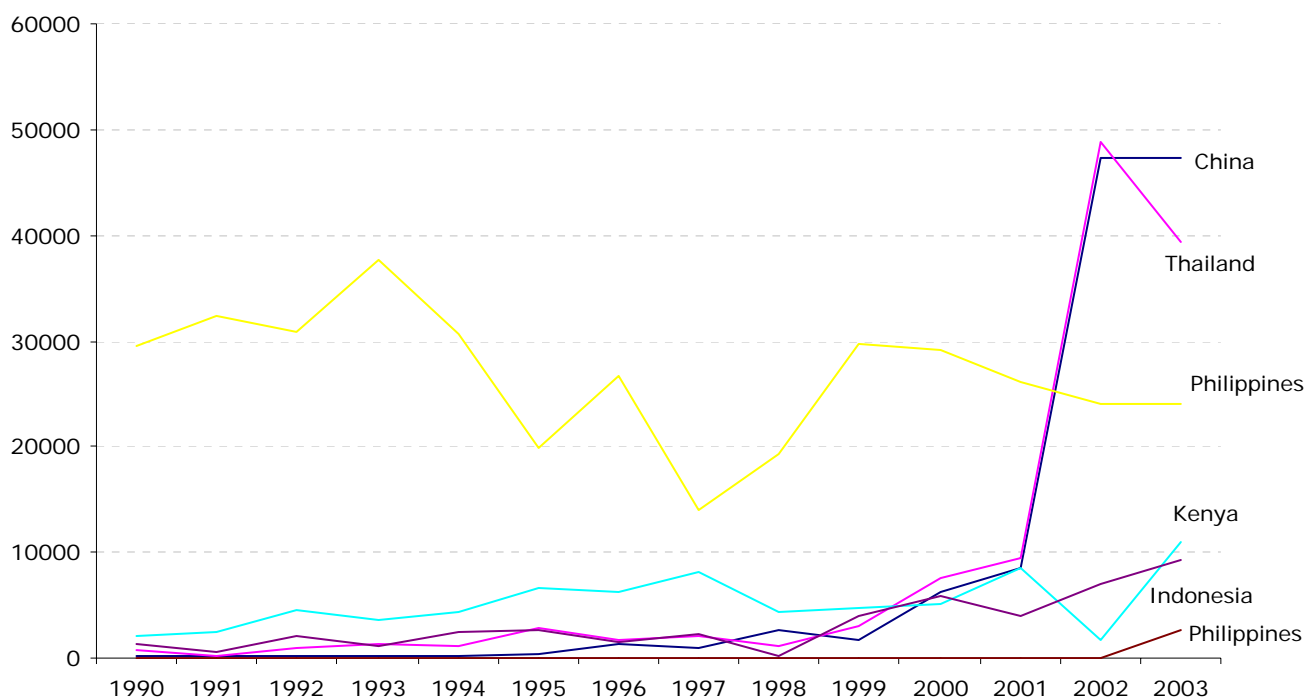
Figure 10: Papaya export revenues of leading developing countries (1990-2003) (in US\$000 )



Source: FAOSTAT

Exports of tropical fruits under the category ‘other tropical fruits’ are overwhelmingly dominated by South East Asian , which gained 89 per cent of the developing world’s overall export revenues. Within the region, three countries – China,<sup>6</sup> Thailand and Malaysia – account for 79 per cent. Malaysia, by far the world’s largest exporter of these fruits until 2000, is seeing its leading position being taken over rapidly by China and Thailand. By 2003, China’s exports of other tropical fruits were twice as high as those of Malaysia at over US\$47 million, while Thailand’s exports had reached nearly Two other South East Asian countries, Indonesia and the Philippines increased their exports of other tropical fruits considerably over the past decade but, their international significance remains limited in comparison with that of their three neighbours. Exports from Kenya, the only significant African exporter of other tropical fruits, followed a highly variable growth path during the 90s, but now seem to be recovering from their all – time low of 2002.

Figure 11: Other tropical fruits export revenues of leading developing countries (1990-2003) (in US\$ 000 )



The disappearance of sweet potatoes from developing country exports is explained by China alone. It was by far the developing world’s leading exporter of the product until the mid nineties, but exports from the country have since decreased rapidly from their peak of US\$97 million in 1991, to less than US\$7 million in 2003. Indonesia, which did not export significant quantities in the early 90s, now ranks second amongst the largest exporters with nearly US\$4 million in 2003. Only two other developing countries export significant volumes of this vegetable: Jamaica, whose exports have increased gradually from US\$0.7 million in 1990 to US\$2.5 million in 2003, and the Dominican Republic, whose exports have started to decline rapidly after their all - time high of US\$3.7 million in 2001.

<sup>6</sup> Including Hong Kong

***Is there room for new players in the structure of exports of tropical fruits and vegetables from developing countries?***

As argued on p. 6, an increase in export volumes does not necessarily translate into an equally proportional increase in export revenues. The expansion of the volume of exports of products that face relatively inelastic demand due to market saturation results in a fall in unitary price. In severe cases, where the price fall is more than proportional to the increase in supply, the result is an actual fall in total export revenues. This problem, commonly referred to as the 'adding up problem', can be of importance to niche products such as exotic fruits. Small countries that export to niche markets may face an elastic own price demand elasticity, but this elasticity rapidly falls as more countries export the same product and progressively saturate the market. The FAO (2004) has recently explored the possibility that the problem of 'adding up' may be present in a few non-traditional agricultural export markets.\* The analysis found that in the case of avocados, an increase in exports from Mexico, the world's largest avocado exporter, would result in depressed prices and a proportionately lower increase in revenue. The 'adding up' problem was not found to be directly relevant to smaller African and Asian avocado exporters, with the possible exception of Indonesia. However, it was suggested that a simultaneous expansion of avocado exports in Africa and Asia would result in a proportionately smaller increase in export revenues. For mangoes, it was found that due to a highly elastic demand, individual African and Latin American countries (with the exception of Mexico) are unlikely to experience an 'adding up' effect when increasing their exports. However, both Africa and Latin America as single entities would experience a less than proportional increase in export revenues when expanding their exported volumes, as would China and India, which face a relatively inelastic demand. In the case of pineapples, it was found that amongst the Asian exporters, Thailand, India, China and the Philippines face relatively low price elasticities of demand, and would therefore be likely to experience a slowdown in export revenues following an increase in exported volumes. Overall, Asia as a whole would experience serious 'adding up' problems following an expansion of exports. African and Latin American countries face higher price elasticities of demand, and would therefore not experience any 'adding up' effect when increasing their exports. However, the 'adding up' problem was found to be relevant for both Africa and Latin America as single entities.

\* *The adding-up problem can be explored in terms of the elasticity of export revenue with respect to volume. See FAO (2004), The Market for Non-Traditional Agricultural Exports, Rome.*

### ***1.3.3 Imports by QUAD Countries***

In 2003, the QUAD countries together imported US\$1.9 billion worth of tropical fruits and vegetables,<sup>7</sup> representing roughly 66 per cent<sup>8</sup> of worldwide imports of these products. Total imports of selected tropical fruits and vegetables in the QUAD countries in 2003 are represented in Table 5. Pineapples were by far the most important fruits in terms of import values, with imports amounting to US\$782 million. Next in line were mangoes (US\$477 million, followed by avocados (US\$456 million) and papayas (US\$136 million). Imports into the QUAD countries of sweet potatoes, the only tropical vegetable traded internationally in significant volumes, amounted to US\$44 million.

The EU is the largest importer of tropical fruits and vegetables within the QUAD group of countries, importing US\$987 million of these products in 2003. The United States is the second largest importer with total imports amounting to US\$620 million, followed by Japan (US\$162 million) and Canada (US\$127 million).

<sup>7</sup> To facilitate comparison between countries, only avocados, mangoes, papayas, pineapples and sweet potatoes are included in the analysis in this section.

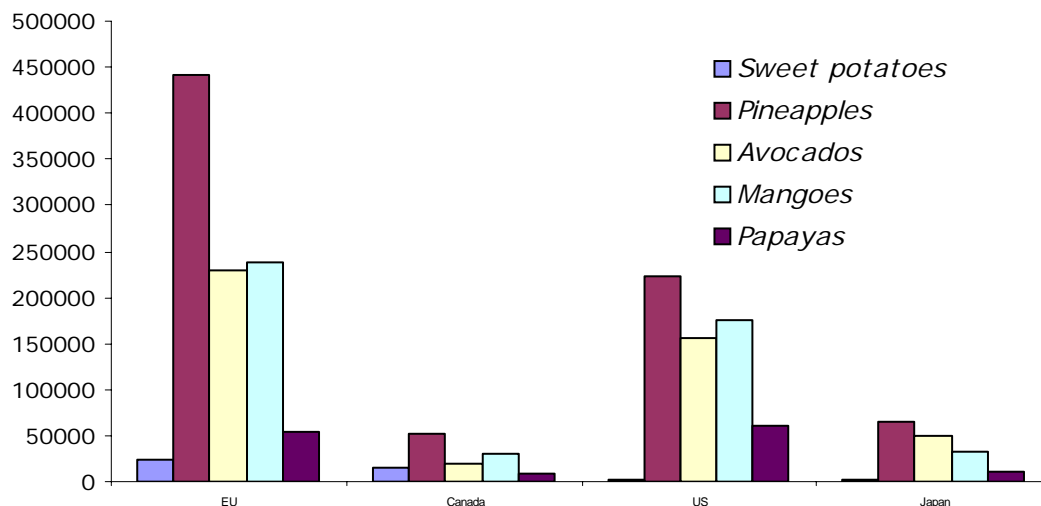
<sup>8</sup> Based on FAOSTAT

**Table 5**  
**Imports of selected tropical fruits and vegetables into the QUAD countries**  
 2003, in US\$

	Sweet potatoes	Pineapples	Avocados	Mangoes	Papayas	TOTAL
EU	23 425 640	441 479 931	230 031 964	237 369 326	54 746 963	987 053 823
Canada	15 048 285	52 055 168	19 677 459	30 628 840	9 709 088	127 118 840
US	2 347 043	223 939 590	156 701 199	176 139 111	60 797 676	619 924 619
Japan	3 175 000	64 346 000	49 953 000	33 191 000	11 414 000	162 079 000
<b>TOTAL</b>	<b>43 995 968</b>	<b>781 820 689</b>	<b>456 363 622</b>	<b>477 328 277</b>	<b>136 667 727</b>	<b>1 896 176 282</b>

Source: Computed from Eurostat, Statistics Canada, United States Census Bureau, FAOSTAT (US\$ values calculated on the basis of IMF average annual exchange rates)

Figure 12: Imports of selected tropical fruits and vegetables into the QUAD countries, 2003, In US\$ 000



### II.3.2.1 European Union

Total imports of the major tropical fruits and vegetables, including avocados, mangoes (including guavas and mangosteens), papayas, pineapples and sweet potatoes into the EU amounted to €877.1 million in 2003, up from €20.8 million in 1995. Pineapples were by far the most important tropical fruit, with imports valued at

€392 million in 2003. Next were mangoes (€111 million) and avocados (€104 million), followed by papayas (€49 million) and sweet potatoes (€21 million). From 1995 to 2003, imports of tropical fruits and vegetables grew by an average annual growth rate of 12 per cent. Over this period, the highest growth rate was recorded for papayas (18 per cent), followed by pineapples and mangoes (13 per cent), avocados (7 per cent) and sweet potatoes (6 per cent) (see Table 6).

**Table 6**  
**Imports of tropical fruits and vegetables into the EU, 1995 – 2003**  
 (in 000 €)

	Sweet potatoes	Pineapples	Avocados	Mangoes	Papayas	TOTAL
<b>1995</b>	12 682 233	144 576 728	117 374 668	79 192 109	12 866 751	366 692 489
<b>1996</b>	5 437 175	154 359 824	114 110 125	77 403 115	16 272 595	367 582 834
<b>1997</b>	5 751 932	186 053 609	107 794 587	83 758 629	18 092 866	401 451 623
<b>1998</b>	7 585 704	174 027 345	100 433 144	99 768 549	22 302 493	404 117 235
<b>1999</b>	7 760 203	181 370 715	130 849 722	121 185 892	24 229 063	465 395 595
<b>2000</b>	8 866 047	233 397 002	139 255 641	147 447 345	30 570 567	559 536 602
<b>2001</b>	12 236 655	275 541 699	159 161 487	166 732 061	34 119 522	647 791 424
<b>2002</b>	15 983 793	331 736 768	148 575 921	153 673 020	43 642 936	693 612 438
<b>2003</b>	20 816 094	392 300 391	204 407 093	210 927 095	48 648 316	877 098 989
<b>Average annual growth rate</b>	6 %	13 %	7 %	13 %	18 %	12 %

Source: Eurostat

Figure 13: Imports of tropical fruits and vegetables into the EU, 1995 - 2003 (in 000 €)

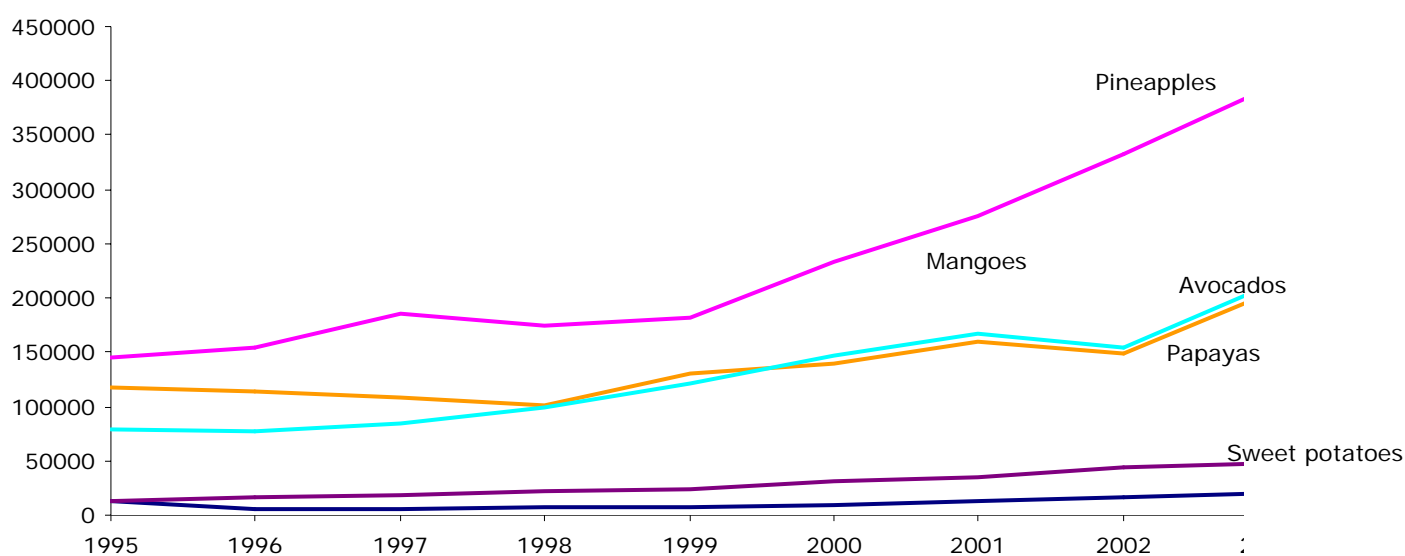
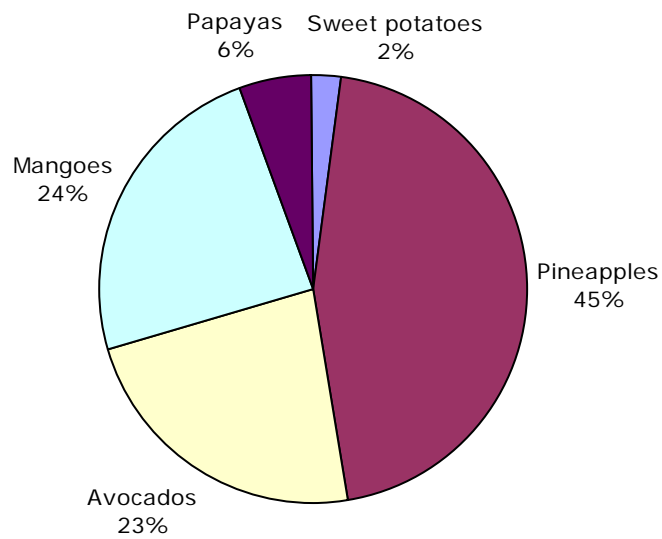
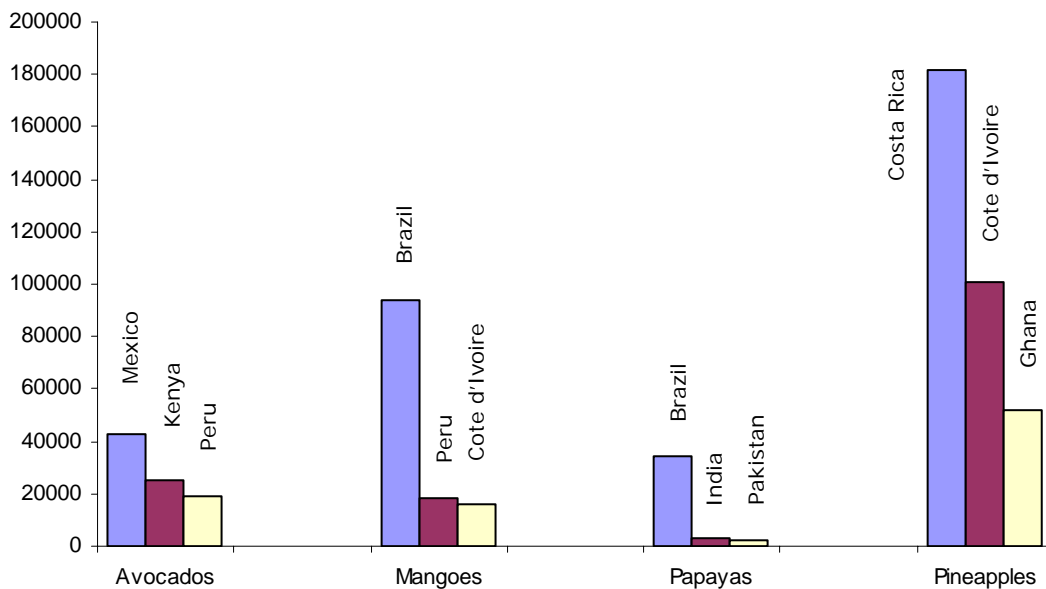


Figure 14: Imports of selected tropical fruits and vegetables into the EU, 2003 (in value)



Source: Eurostat

Figure 15: Main suppliers of imports of selected tropical fruits and vegetables into the EU, 2003 (in 000 €)



Source: Eurostat

## II.3.2.2. Canada

In 2003, Canada imported US\$127 million worth of tropical fruits and vegetables, up from US\$48 million in 1995. From 1995 to 2003, imports grew at an average annual growth rate of 13 per cent. Growth rates for individual products ranged from 24 per cent for pineapples over 11 per cent for avocados and 8 per cent for sweet potatoes and mangoes, to 6 per cent for papayas.

**Table 7**  
**Imports of tropical fruits and vegetables into Canada, 1995 – 2003**  
**(in US\$000)**

	Sweet potatoes	Pineapples	Avocados	Mangoes	Papayas	TOTAL
<b>1995</b>	8 289 059	9 221 936	8 575 511	16 119 859	6 042 449	48 248 814
<b>1996</b>	8 480 556	10 486 597	8 961 032	18 571 515	6 348 838	52 848 538
<b>1997</b>	9 416 979	14 961 617	10 023 414	20 010 055	5 935 575	60 347 640
<b>1998</b>	11 232 927	17 585 424	9 899 096	23 288 352	5 593 957	67 599 756
<b>1999</b>	10 983 355	21 587 294	11 347 481	24 770 293	6 803 582	75 492 005
<b>2000</b>	11 167 978	26 285 936	12 299 496	24 949 848	8 231 903	82 935 161
<b>2001</b>	11 607 839	31 299 912	15 124 919	28 486 725	8 903 312	95 422 707
<b>2002</b>	11 275 848	38 440 094	15 327 917	24 418 242	8 223 293	97 685 394
<b>2003</b>	15 048 285	52 055 168	19 677 459	30 628 840	9 709 088	127 118 840
<i>Average annual growth rate</i>	8 %	24 %	11 %	8 %	6 %	13 %

Figure 16: Imports of tropical fruits and vegetables into Canada, 1995 - 2003 (in US\$000)

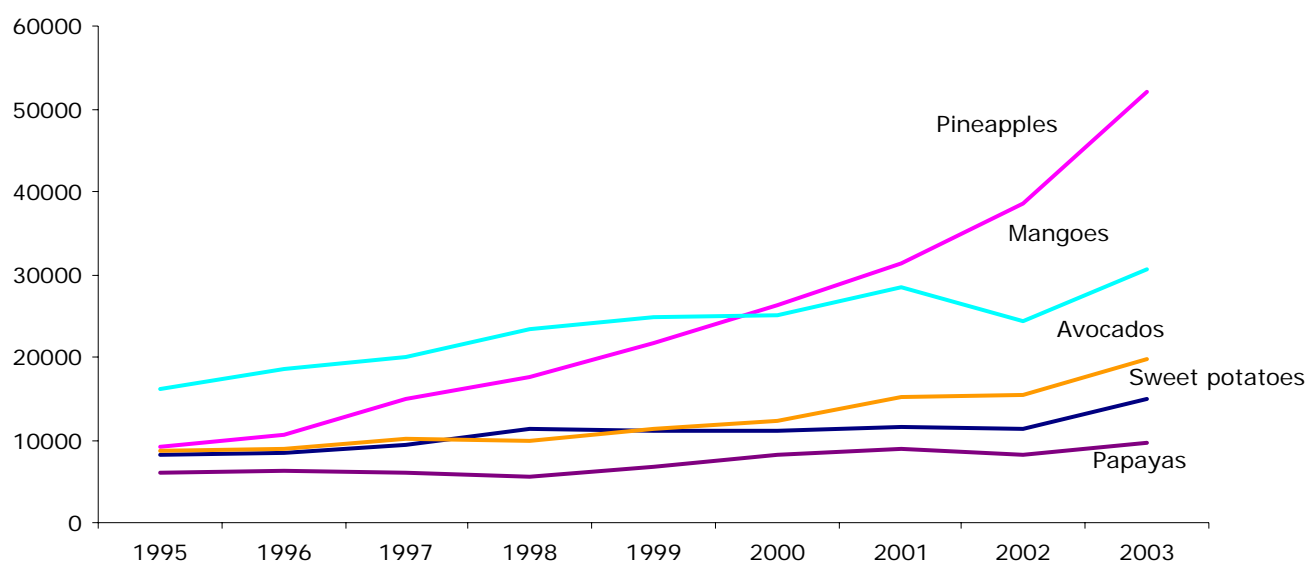


Figure 17: Imports of selected tropical fruits and vegetables into Canada, 2003 (in value)

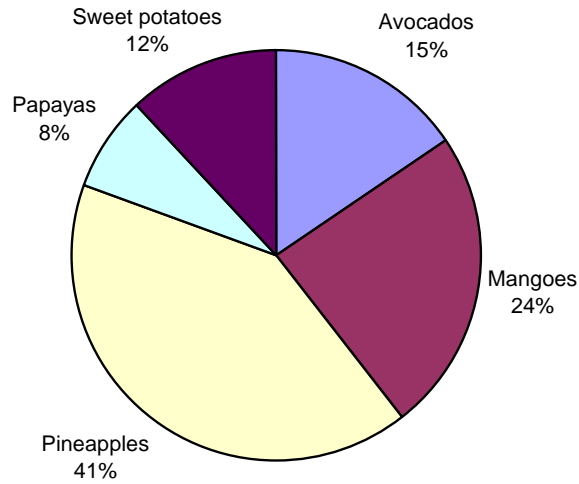
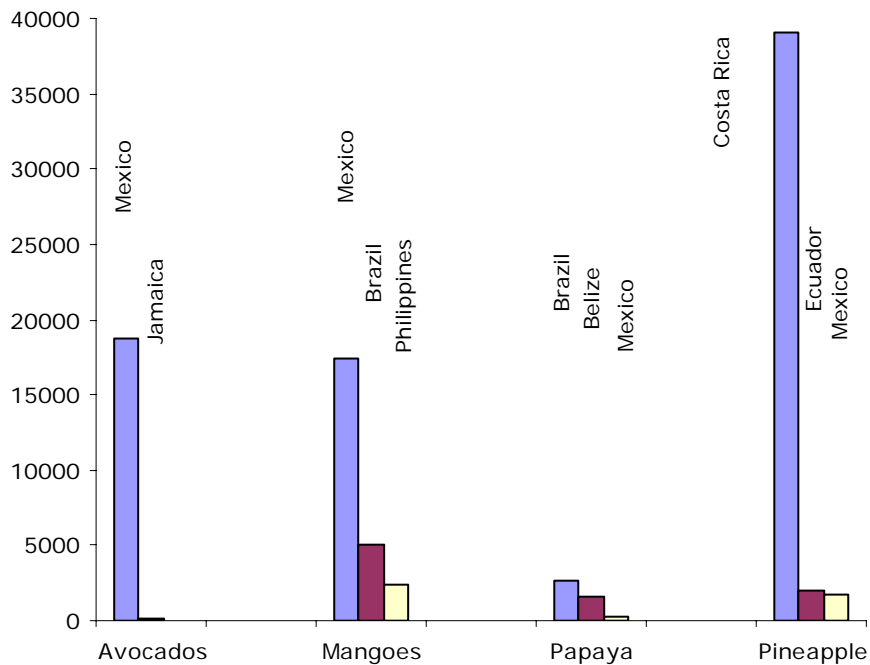


Figure 18: Main suppliers of imports of selected tropical fruits and vegetables into Canada, 2003



Source: Statistics Canada



## II.3.2.3. United States

In 2003, the United States imported US\$620 million of tropical fruits and vegetables, up 206 per cent compared to 1995. Pineapples were the most important tropical fruit imported into the country, with imports amounting to US\$224 million, followed by mangoes (US\$176 million), avocados (US\$157 million), papayas (US\$61 million) and sweet potatoes (US\$2 million). From 1995 to 2003, imports of tropical fruits and vegetables into the United States increased by an average annual rate of 15 per cent. The highest growth rate is recorded for imports of avocados, which increased by an average of 34 per cent annually. Substantial average annual growth rates were also recorded for pineapples (23 per cent), papayas (16 per cent) and mangoes (5 per cent). Imports of sweet potatoes decreased by an average annual rate of one per cent over the period.

**Table 8**  
**Imports of tropical fruits and vegetables into the United States, 1995 - 2003 (in US\$ 000)**

	Sweet potatoes	Pineapples	Avocados	Mangoes	Papayas	TOTAL
<b>1995</b>	2 570 293	42 947 128	14 719 594	123 744 136	18 020 751	202 001 902
<b>1996</b>	4 683 618	54 358 589	23 365 579	106 541 075	29 892 268	218 841 129
<b>1997</b>	5 321 503	85 303 009	28 143 707	121 894 659	24 719 197	265 382 075
<b>1998</b>	4 697 979	83 464 458	64 346 119	135 628 777	25 004 800	313 142 133
<b>1999</b>	5 156 356	120 605 562	72 646 509	146 959 240	44 462 908	389 830 575
<b>2000</b>	4 379 799	129 906 886	107 693 851	146 142 208	46 613 848	434 736 592
<b>2001</b>	4 274 864	153 256 027	83 931 854	162 529 305	54 692 853	458 684 903
<b>2002</b>	3 676 225	188 168 413	134 731 703	163 399 549	58 272 189	548 248 079
<b>2003</b>	2 347 043	223 939 590	156 701 199	176 139 111	60 797 676	619 924 619
<i>Average annual growth rate</i>	- 1 %	23 %	34 %	5 %	16 %	15 %

Figure 19: Imports of tropical fruits and vegetables into the United States, 1995 - 2003 (in US\$ 000\$)

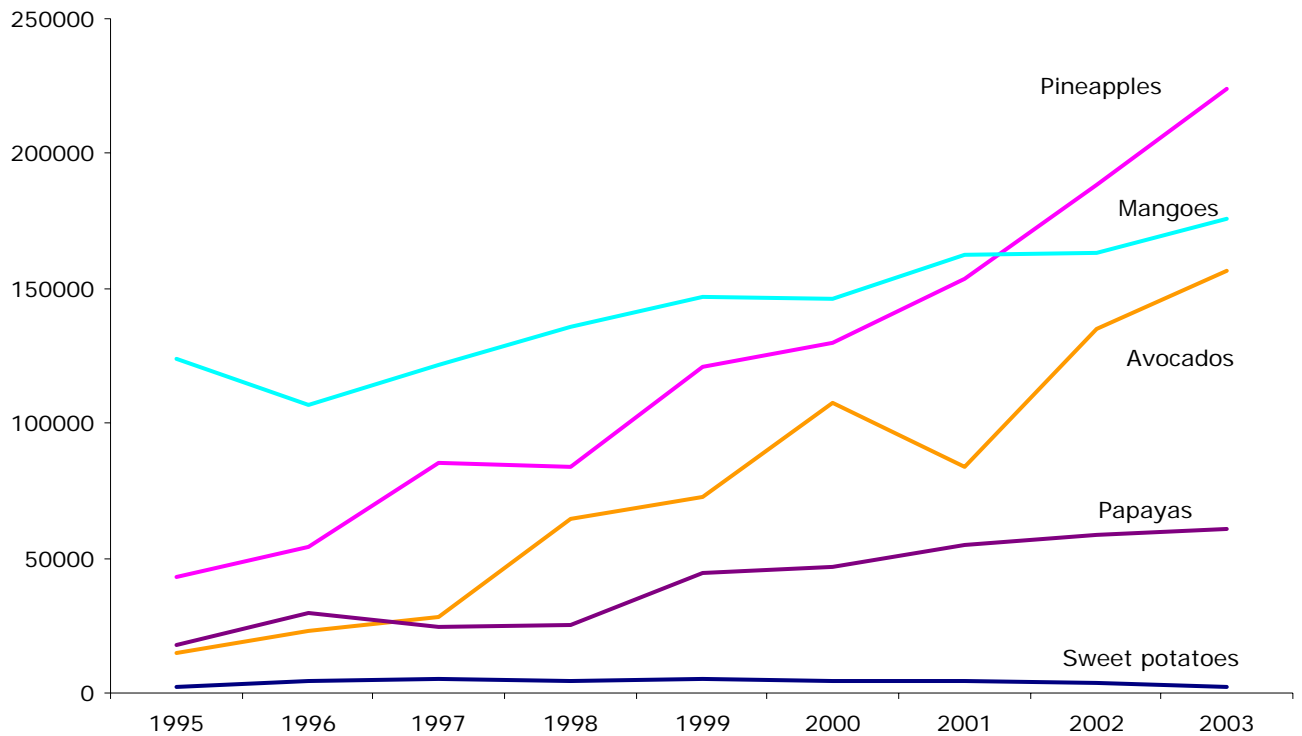
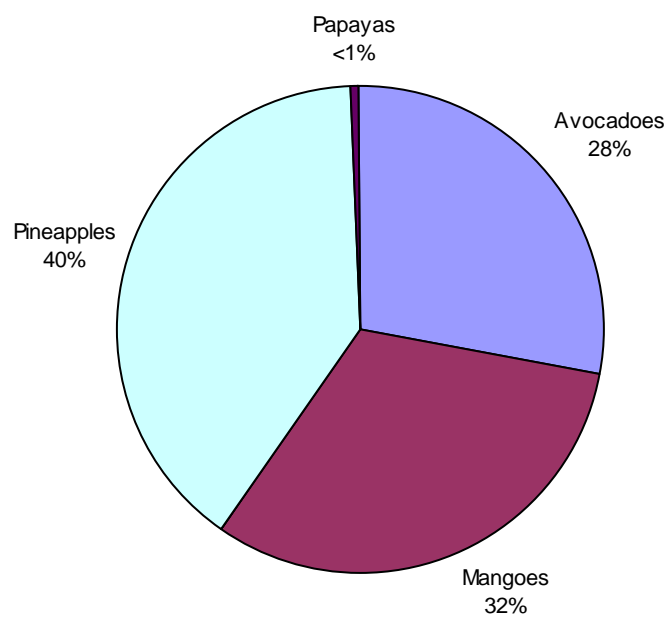
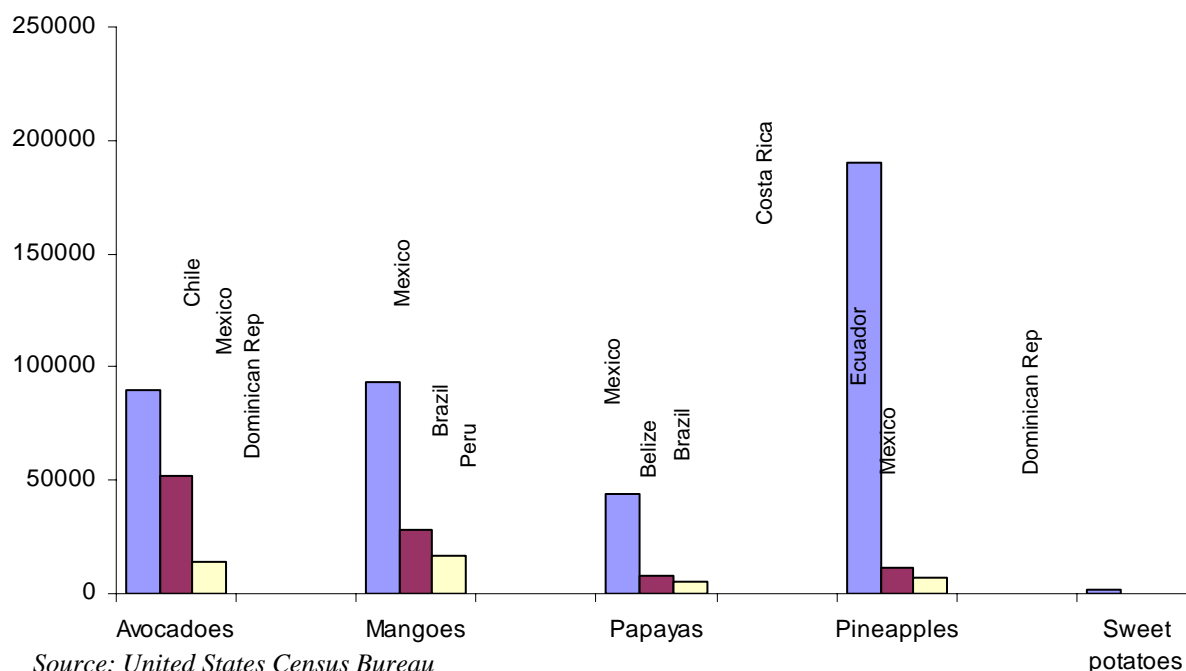


Figure 20: Imports of selected tropical fruits and vegetables into the United States, 2003 (in value)



Source: United States Census Bureau

Figure 21: Main suppliers of imports of selected tropical fruits and vegetables into the United States, 2003 (in US\$000)



#### II.3.2.4. Japan

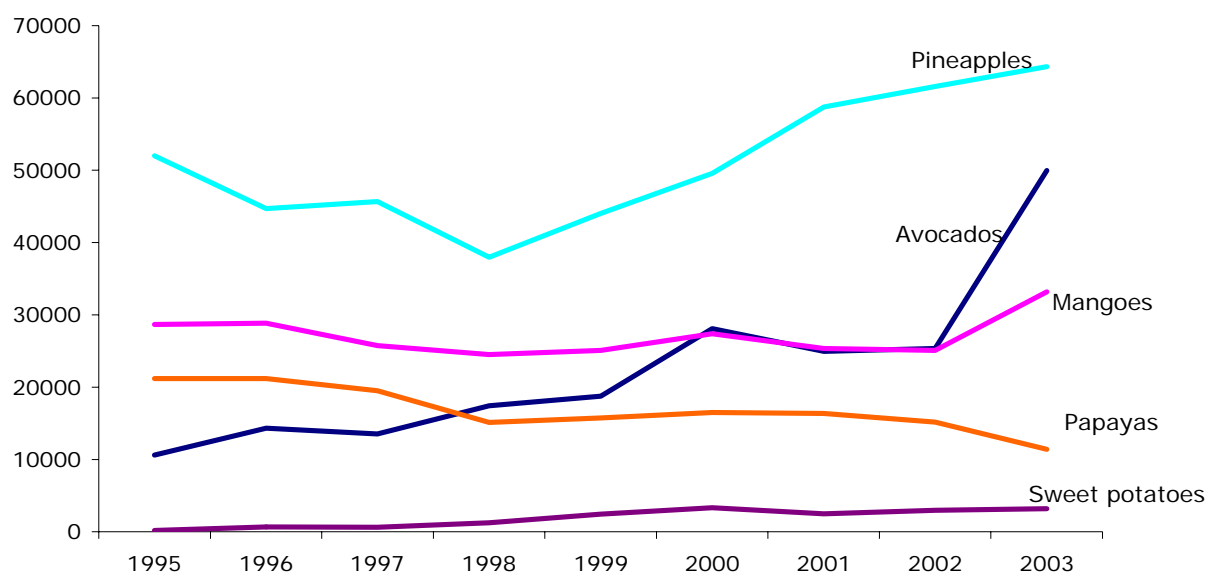
In 2003, Japan imported US\$162 million worth of tropical fruits and vegetables, up 43 per cent in comparison with 1995. Pineapples were the most important tropical fruit imported into the country, with imports amounting to US\$64 million, followed by avocados (US\$50 million), mangoes (US\$33 million), papayas (US\$11 million) and sweet potatoes (US\$3 million). From 1995 to 2003, imports of tropical fruits and vegetables into Japan increased by an average of 5 per cent annually. Imports of sweet potatoes grew by an average of 45 per cent per annum, but remain marginal in the country's overall import structure for tropical fruits and vegetables. Other average annual growth rates amounted to 21 per cent for avocados, 3 per cent for pineapples and 2 per cent for mangoes. Remarkably, imports of papayas into Japan fell by an average of 7 per cent annually from 1995 to 2003.

**Table 9**  
**Imports of tropical fruits and vegetables into Japan, 1995 – 2003**  
**(in US\$ 000 )**

	Avocados	Mangoes	Papayas	Pineapples	Sweet Potatoes	TOTAL
<b>1995</b>	10 620 000	28 656 000	21 178 000	52 004 000	161 000	112 619 000
<b>1996</b>	14 318 000	28 830 000	21 182 000	44 710 000	660 000	109 700 000
<b>1997</b>	13 545 000	25 766 000	19 501 000	45 667 000	641 000	105 120 000
<b>1998</b>	17 454 000	24 525 000	15 145 000	37 964 000	1 238 000	96 326 000
<b>1999</b>	18 768 000	25 083 000	15 751 000	44 007 000	2 414 000	106 023 000
<b>2000</b>	28 117 000	27 400 000	16 503 000	49 557 000	3 306 000	124 883 000
<b>2001</b>	24 937 000	25 344 000	16 389 000	58 748 000	2 473 000	127 891 000
<b>2002</b>	25 347 000	25 092 000	15 156 000	61 602 000	2 951 000	130 148 000
<b>2003</b>	49 953 000	33 191 000	11 414 000	64 346 000	3 175 000	162 079 000
<i>Average annual growth rate</i>	21 %	2 %	- 7 %	3 %	45 %	5 %

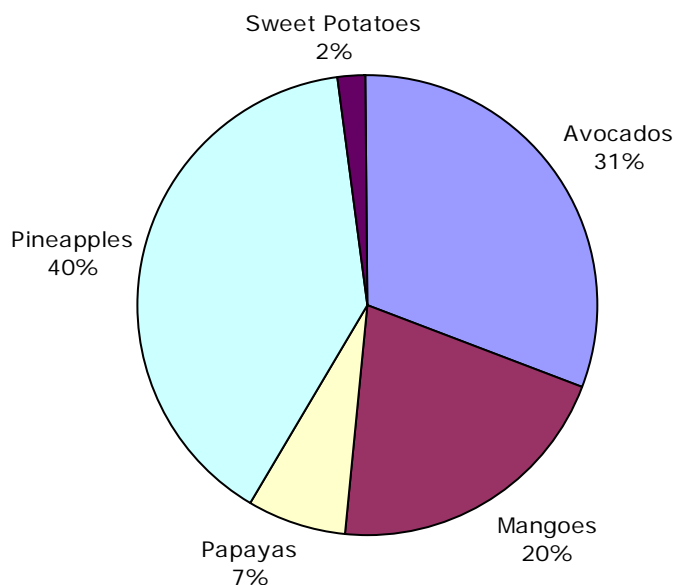
Source: FAOSTAT

Figure 22: Imports of tropical fruits and vegetables into Japan, 1995 - 2003 (in US\$ 000)



Source: FAOSTAT

Figure 23: Imports of selected tropical fruits and vegetables into Japan, 2003 (in value)



### WORLD MARKET OUTLOOK FOR 2010

According to the latest projections of the FAO (2003b), the outlook for the demand for fresh tropical fruits over the next decade is favourable. The demand for tropical fruits is expected to grow by nearly 8 per cent until 2010, which is a conservative estimate compared to the growth since 2000. The caution of the projection is due to the observed downward trend in prices, caused by a slowly stagnating demand that faces a fast expansion in supply. The best prospects are for the demand for mangoes, which according to FAO can grow close to 10 per cent per annum in volume terms until 2010. The demand for papayas would follow closely with a rate of growth of 8.3 per cent, and pineapples at the slower rate of 6 per cent. No projections are available for avocados. World trade of the main tropical fruits is expected to reach 4.3 million tonnes, 87 per cent of which would be imported by QUAD countries. The FAO estimates that prices for major tropical fruits can be expected to be guided by quality attributes, whereas those of minor tropical fruits may remain relatively firm, firstly due to their novelty in QUAD markets and secondly, because they are generally destined for ethnic minorities and the catering industry.

## **II. SPS REQUIREMENTS IMPOSED BY QUAD COUNTRIES UPON IMPORTED TROPICAL FRUITS AND VEGETABLES**

Food safety standards in the QUAD countries are becoming more stringent. Increased scientific knowledge of acute and long term public health risks associated with the consumption of unsafe food, and improvements in detection, information and reporting systems, have led to a greater degree of complexity in the way food safety among public health authorities is put in practice. Meanwhile, the demand for better food safety has increased with growing consumer affluence and, in reaction to a number of highly publicized food safety crises which have hit the QUAD countries during the past decade.

Furthermore, developed countries are increasingly relying upon imported foods to extend the range of products offered to consumers and ensure their year round supply. As importing countries generally have limited possibilities of enforcing their food safety standards beyond their national territories, and may consider exporting countries' standards inadequate or unreliable, food safety requirements imposed upon imported foods are strengthened (Buzby, 2003; Buzby and Unnevehr, 2003). Thus, the objective of the protection of human health by ensuring the safety of foodstuffs, which has now become paramount to QUAD countries' food safety policy, may interfere with the trading interests of foreign suppliers.

Over the course of the past decade, QUAD countries have adopted an integrated approach to food safety on the basis of the 'farm-to-table' principle, according to which food safety measures must be implemented at each stage of the food supply chain. Science-based risk assessment procedures, carried out by independent advisory agencies, have become an integral part of QUAD countries' food safety policies. It is generally accepted that risk managers may undertake actions to protect human health if there is reason to believe that an unacceptable risk exists, even if the supporting information necessary to carry out a comprehensive risk assessment is not sufficiently complete. This is known as the precautionary principle, and its adoption has increased QUAD governments' discretionary power over which foodstuffs can be traded in their markets, be they produced domestically or imported from abroad.

While new regulations are being developed to improve the responsiveness of food safety systems to new hazards, existing legislation has been modernized and consolidated with a view to increase transparency, to reduce overlap, to improve the efficiency of food safety systems and to clarify stakeholders' responsibilities. In reaction to the food safety crises of the past 10 years, QUAD governments are shifting the responsibility for the safety of their nations' food supply from public food safety authorities to private food business operators, who are increasingly held responsible for the safety of the foodstuffs they place on the market. As a result, food business operators are increasingly imposing food safety requirements upon their suppliers in foreign countries in an effort to eliminate as many food safety risks as possible.

Food safety authorities in the QUAD countries are becoming increasingly concerned about the negative impact upon human health of residues of active substances in and on foodstuffs. Increased scientific knowledge on the residual behaviour of active substances and improved detection methods have generally led to the setting of lower maximum residue levels (MRLs), making it more difficult for foreign suppliers to comply with these limits. Furthermore, the number of active substances authorized for use on foodstuffs consumed in the QUAD countries has decreased as a result of stringent and costly registration and authorization procedures, which may limit producers in developing countries in their choice of optimal production methods. Recent legislative initiatives undertaken by QUAD governments give reason to believe that these trends will persist in the short to medium term.

This section describes the most relevant phytosanitary and sanitary requirements, applicable to tropical fruits and vegetables and, of particular interest to developing countries, of the SPS import regimes in all QUAD countries: the United States, the European Union, Japan and Canada.

## II.1 The United States

### II.1.1 Phytosanitary

Imports of plant products, including fruits and vegetables, into the United States are regulated by the Plant Protection Act (PPA), which became law in June 2000 after 17 years in the making. It consolidates all or part of ten previously existing plant health laws of the United States Department of Agriculture (USDA) into one comprehensive law. The PPA gives the Secretary of Agriculture, and through delegated authority, the Animal and Plant Health Inspection Service (APHIS), the ability to prohibit or restrict the importation of plants and plant products into the United States and, to prevent the introduction and spread of plant pests that are new or not widely distributed within the United States. The Plant Protection Act 'Subpart – Fruits and Vegetables' (7 CFR 319.56 through 319.56-8) regulates the importation of fruits and vegetables.

No imports of fruits and vegetables are allowed into the United States territory<sup>9</sup> unless they are accompanied by a permit issued by the Permit Staff of APHIS. The permit, which is valid for five years,<sup>10</sup> is issued if the USDA is satisfied that the fruit or vegetable:

- ◆ is not attacked by injurious insects in the country of origin;
- ◆ has been treated or is to be treated for all injurious insects that attack it in the country of origin;
- ◆ is imported from a definite area or district in the country of origin that is free from all injurious insects that attack it; or
- ◆ is not attacked by certain injurious insects in a definite area or district of a country and has been treated for all other injurious insects that attack it in the area or district in the country of origin.

In the latter two cases, the plant protection authorities of the country of origin must: demonstrate the absence of infestations of injurious insects in the definite area or district; adopt and implement measures to prevent the introduction of injurious insects into the definite area or district that are deemed to be at least equivalent to the requirements imposed to prevent the introduction of injurious insects into the United States and, submit written procedures for the conduct of surveys and the implementation of the measures.

In the evaluation of the risk of introducing pests in imported fruits and vegetables preceding the issue of an import permit, APHIS relies on its Risk Analysis Staff, which carries out Plant Pest Risk Assessments (PRAs). A PRA identifies pests that may be introduced with a commodity, and estimates how likely it is that those pests would be introduced and what the potential consequences of the introduction are. The compilation of scientific data regarding the prevalence of pests and the effectiveness of risk mitigation measures necessary to carry out a PRA may prove highly burdensome for developing countries whose financial, technical and human resources are limited. This may prevent certain developing countries from applying for a PRA, or significantly delay the finalization of a PRA.

Tropical fruits and vegetables originating from developing countries and currently approved for entry into the United States are listed in Table 10. Specific treatment, growing or inspection requirements apply *inter-alia* to the following tropical fruits and vegetables:<sup>11</sup> mountain papayas, passion fruits and cherimoyas from Chile; litchis from China; litchis from India; carambola from Mexico; mangoes from Central America, South America and the West Indies; avocados from Mexico; papayas from Central America and Brazil, and mangoes from the Philippines.

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<sup>9</sup> Except dried, cured or processed fruits and vegetables, fruits and vegetables grown in Canada and fruits and vegetables grown in the British Virgin Islands and imported into the United States Virgin Islands.

<sup>10</sup> Permits for the importation of Mexican avocados are valid for one year only

<sup>11</sup> Any fruit or vegetable that is required to be treated or subjected to growing or inspection requirements to control one or more of the 11 species of fruit flies and one species of seed weevil may instead be treated by irradiation. Authorized treatments are listed in the Plant Protection and Quarantine Manual, which is incorporated in the PPA.

**Table 10**  
**Tropical fruits and vegetables originating from developing countries**  
**approved for entry into the United States**

Commodity	Country of origin
Pineapple	Algeria, Angola, Antigua and Barbuda, Argentina, Barbados, Belize, Benin, Bolivia, Brazil, Burkina Faso, Cameroon, Cayman Islands, Chile **, Colombia, Congo, Costa Rica, Côte d'Ivoire, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, French Guyana, French Polynesia, Ghana, Grenada, Guadeloupe, Guatemala, Guinea, Haiti, Jamaica, Liberia, Mali, Martinique, Mauritania, Mexico, Morocco, Netherlands Antilles, Nicaragua, Niger, Nigeria, Panama, Paraguay, Peru, Philippines, Saint Lucia, St Vincent and the Grenadines, Senegal, Sierra Leone, Thailand *, Togo, Trinidad and Tobago, Tunisia, Turkey *, Uruguay, Venezuela
Papaya	Antigua and Barbuda, Bahamas *, Barbados, Belize, Bermuda, Brazil (state of Espirito Santo only), Cayman Islands, Chile, Costa Rica, Dominican Republic, El Salvador, Grenada, Guadeloupe, Guatemala, Honduras, Martinique, Mexico, Nicaragua, Panama, St Kitts and Nevis, Saint Lucia, St Martin, St Vincent and the Grenadines, Trinidad and Tobago
Avocado	Antigua and Barbuda *, Barbados *, Bermuda, Cayman Islands *, Chile, Dominica *, Dominican Republic *, Guadeloupe *, Haiti *, Jamaica *, Martinique *, Mexico, Philippines *, St Kitts and Nevis *, Saint Lucia *
Mango	Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Peru, Philippines (Guimaras Island only), Venezuela
Carambola	Mexico
Mangosteen	Antigua and Barbuda, Bahamas, Barbados, Belize, Cayman Islands, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Mexico, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Trinidad and Tobago *
Durian	Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, French Guyana Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, Peru, Philippines, Suriname, Uruguay, Venezuela
Litchis	Bahamas *, China, Dominican Republic *, Grenada, Haiti *, India, Jamaica *, Mexico, Thailand
Longan	Bahamas *, Bermuda, China, Dominican Republic *, Haiti *, Jamaica *
Rambutan	Belize, Costa Rica, Grenada, Guatemala, Honduras, Mexico, Nicaragua, Panama
Guava	Bermuda
Passion fruit	Bermuda, Chile **, Grenada, St Vincent and the Grenadines
Cherimoya	Chile
Yellow pitaya	Colombia
Sweet potato	Dominican Republic *

*Tropical fruits and / or vegetables imported from countries marked with an \* may only be imported through selected ports in the United States.*

*Regional exceptions apply to countries marked with \*\*.*

Source: USDA APHIS



### II.1.2 Sanitary

Tropical fruits and vegetables imported into the United States must comply with the health and safety requirements established under the *Federal Food, Drug and Cosmetics Act* of 1938 by the Center for Food Safety and Applied Nutrition (CFSAN) of the Food and Drug Administration. The *Food, Drug and Cosmetic Act* prohibits commerce of adulterated or improperly labelled foods, drugs and cosmetics. Among CFSAN's main responsibilities are to ensure the safety of food additives and biotechnology foods, address health risks associated with food borne chemical and biological contaminants, and ensure the proper labelling of foods.

The *Federal Insecticide, Fungicide and Rodenticide Act*, which was first approved in 1947, directs the United States Environmental Protection Agency to register all pesticides and other chemicals used in the United States, and to establish residue tolerances for chemicals on domestic and imported food. The United States Food and Drug Administration (FDA) of the United States Department of Health and Human Services and Public Health Service inspects domestic and imported food to ensure that illegal chemicals are not present in the products and residue tolerances are respected.

A historical overview of recent initiatives developed by the United States administration in the field of food safety and health illustrates that public authorities' concern over these issues has increased markedly over the past decade. As a result, food safety and health requirements imposed upon both domestic and imported foodstuffs have been strengthened.

In 1997, United States President Bill Clinton launched the *National Food Safety Initiative*, a multi – agency effort designed to reduce the incidence of food borne illness by strengthening and improving food safety practices and policies. The initiative included several new programmes to promote food safety, including improved inspection and prevention systems (e.g. HACCP), and stepped up funding for FDA inspections and food safety research. That same year, a report entitled *Food Safety From Farm to Table: A National Food Safety Initiative* was prepared at the President's request by the Department of Health and Human Services, the USDA and the EPA, outlining recommendations to improve the safety of food consumed in the United States.

In response to a number of highly publicized outbreaks of food borne diseases linked to (imported) fruits and vegetables, the Clinton Administration launched, in 1997, the *Produce and Import Safety Initiative*, aimed at upgrading domestic food safety standards and strengthening food safety systems in foreign countries. The initiative is implemented in coordination with the FDA and CFSAN. In 1998, President Clinton instructed Congress to pass food safety legislation giving the FDA greater authority over imported foods, to ensure it halts imports of fruits, vegetables and other food products imported into the United States from foreign countries with food safety systems that do not provide the same level of protection required for domestic United States products. The *Produce and Import Safety Initiative* also required FDA to halt imports from countries or facilities that do not allow FDA inspections to take place. Ways were sought to improve the monitoring of agricultural and manufacturing practices abroad and to assist foreign countries in improving these practices where necessary. The initiative was taken further in 1999 when President Clinton announced several new measures to prevent unsafe food from being imported into the United States, by preventing 'port shopping', requiring the destruction of imported food that poses a serious public health threat and, by increasing the bond that importers must post. These procedures were enacted by the FDA in 2001.

In 1998, the FDA and the USDA developed the voluntary Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables, to assist both domestic and foreign fruits and vegetables producers to ensure the safety of their products by addressing microbial food safety hazards and good agricultural and management practices. To date, the FDA does not have mandatory food safety requirements with respect to microbial contamination of fruits and vegetables. However, good agricultural practices are promoted as a way to minimize the risk of microbial contamination, instead of counting on relatively unreliable testing at the United States border (Calvin, 2003).

The initiative on microbial contamination was taken further in 2004 with the Action Plan to Minimize Foodborne Illness Associated With Fresh Produce Consumption, targeting microbial food safety hazards, including bacteria, viruses and parasites in, or on fruits and vegetables consumed in the United States,

whether produced in the United States or abroad. The Action Plan is being developed by the FDA in coordination with the Center for Disease Control and Prevention (CDC) and the USDA. Based on the principle that each actor involved in producing, packing, processing, transporting, distributing or preparing of fruits and vegetables is responsible for the reduction and control of microbial contamination, the Action Plan extends to all parts of the food chain, from farm to retail and consumption, involving both the public and the private sectors.

## II.2 The European Union

### II.2.1 Phytosanitary

EU plant health legislation is governed by Council Directive 2000/29/EC on 'Protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community', which was published in 2000. The Directive is aimed at protecting the safety of food derived from plants, including fruits and vegetables, and securing the health and quality of crops in all EU Member States. The Directive lists all harmful organisms, plants and plant products whose introduction into the EU is prohibited, and lays down provisions for restrictions on the introduction of certain plants and plant products into the EU. Certain fruits and vegetables, including cherimoyas, mangoes, passionfruits and guavas, must be accompanied by a phytosanitary certificate and are subjected to plant health inspections upon arrival in the EU.

All tropical fruits and vegetables may in principle be imported into the EU, without any restrictions regarding the country of origin. This means that the plant health regime in the EU is distinctively different from that of the United States. Whereas in the United States no fruit or vegetable variety can be imported unless a Plant Risk Assessment has demonstrated that the importation does not represent an unacceptable risk to United States plant health, no plant health risk analysis is required to import fruits and vegetables into the EU. Restrictive measures in the EU are implemented only in cases where a specific problem has been detected.

### II.2.2 Sanitary

As in the United States, the EU also responded with legislation to a number of highly controversial food safety crises in the late 90s. The European Commission in 2000 adopted its *White Paper on Food Safety*, setting out a strategy for the development of a proactive new European food safety policy. The objective of the *White Paper* was to ensure a high level of human health and consumer protection by modernizing legislation into a coherent and transparent set of rules, reinforcing controls 'from the farm to the table' and, increasing the capacity of the European scientific advice system. The strategic priorities of the *White Paper* are:

- ◆ to create a European Food Safety Authority (EFSA);
- ◆ to implement a 'farm-to-table' approach to food safety legislation and,
- ◆ to establish the role of all stakeholders in the food safety system: the primary responsibility for food safety lies with feed and food operators, while Member States ensure surveillance and control of these operators, and the European Commission tests the Member States' control capacities through audits and inspections.

Following the publication of the *White Paper*, the EU adopted in 2002 Regulation 178/2002 on the *General Principles of Food Law*, or the *General Food Law*,<sup>12</sup> which constitutes the core of the EU's food safety re-

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<sup>12</sup> A guidance document was developed by a group of EU Member State experts in 2004 to clarify the main requirements of the General Food Law, including traceability of food and feedstuffs, responsibility of operators, withdrawal of unsafe food or feed from the market and notification to authorities, to EU food chain operators and third country trading partners. This document can be downloaded from

gime. According to the *General Food Law*, feed and food operators are responsible for the safety of the feed and food they produce, transport, store or sell; they shall not place unsafe food or feed on the market, and shall immediately withdraw food or feed from the market if they have reason to believe that it is not safe.

The *General Food Law* further lays down the principles of risk analysis in relation to food and feed safety, by establishing the three interrelated components of risk analysis: risk assessment (scientific advice and information analysis); risk management (regulation and control); and risk communication. It establishes the structures and mechanisms for the scientific evaluations undertaken by the European Food Safety Authority, which provides independent scientific advice on all matters with a direct or indirect impact on food safety. The *General Food Law* formally establishes the precautionary principle to guide risk management. According to this principle, risk managers may undertake actions to protect human or animal health if there is reason to believe that an unacceptable risk exists, even if the supporting information necessary to carry out a comprehensive risk assessment is not sufficiently complete.

Among the core requirements of the *General Food Law* is the identification of food and feed sources. Regulation 178/2002 defines traceability as the ability to trace and track food, feed and ingredients through all stages of production, processing and distribution. The European requirement for traceability – effective 1 January 2005 – is limited to the ability to identify at least the immediate supplier of the foodstuff in question and its immediate subsequent recipient, with the exemption of retailers to final consumers (the one step back – one step forward principle). Food entering the EU from third countries must be traceable to the point of import. Exporters in trading partner countries are not legally required to fulfil the traceability requirement imposed within the EU.<sup>13</sup> However, the importer must be able to specify by whom the product was exported from the country of origin.

In its *General Food Law*, the European Commission provided for a radical revision of the EU's food hygiene rules. In 2004, after nearly four years of negotiations, a package of five measures intended to update and consolidate the existing 17 hygiene directives, was adopted. The Hygiene Regulation, which will apply as from 1 January 2006, is aimed at making a single, transparent hygiene policy applicable to all operators within the food chain on the basis of the farm-to-table principle, and creating effective instruments to manage food safety and any future food crises throughout the food chain. Based upon the principle that food business operators bear primary responsibility for food hygiene, the Regulation requires the implementation of Hazard Analysis Critical Control Points (HACCP)<sup>14</sup> and adherence to Codex rules. Food business operators shall comply with the general hygiene requirements of the Regulation, and implement a number of specific hygiene measures (e.g. compliance with microbiological criteria and temperature control requirements, sampling and analysis). All food business operators shall convey information regarding the nature of their business and the premises where operations are carried out, to the relevant authorities, with a view to the registration of each establishment by these authorities. Businesses may be inspected to ensure their compliance with the requirements of the Hygiene Regulation, which is a precondition for trading. If all requirements are met, a registration number will be issued, which must be placed on all foodstuffs produced by the operator in question. The general and specific hygiene requirements and the requirements for the registration of food business operators apply not only to operators based within the EU, but likewise, to all foreign operators exporting foodstuffs into the EU.

In the early 90s, the European Commission embarked upon a comprehensive review process of all active substances used in plant protection products<sup>15</sup> used in the EU, under the procedures governed by Council

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[http://www.europa.eu.int/comm/food/food/foodlaw/guidance/index\\_en.htm](http://www.europa.eu.int/comm/food/food/foodlaw/guidance/index_en.htm).

<sup>13</sup> It is common practice among EU food business operators to request trading partners to meet traceability requirements as part of the operators' contractual arrangements.

<sup>14</sup> The seven principles of HACCP are: analysis of hazards; identification of critical control points; establishment of preventing measures; establishment of monitoring procedures; establishment of corrective actions; establishment of procedures to verify that the system is working properly and, the establishment of record keeping to document the system.

<sup>15</sup> Plant protection products are substances, or mixtures of substances, of a chemical or biological nature, or formulated preparation of microorganisms (fungi, viruses, bacteria, protozoa or other microscopic self-replicating biotic entities), intended for use in agriculture, horticulture, forestry, gardens and amenity areas, on stored plant products and on land

Directive 91/414. The regulation distinguishes between active substances that had been approved for use in crop protection products within the EU prior to July 1993 (the 'existing substances'), and new active substances introduced after that date. Under Regulation 91/414, pesticide manufacturers apply for the registration of an active substance by submitting a 'dossier' containing all scientific information necessary for the evaluation of the substance. After completing the evaluation process, during which Member States peer-review the application and EFSA provides its opinion, the European Commission decides to either include the substance in the annex to Directive 91/414, thereby authorizing its use in the EU or, to exclude it from the list in order to effectively prohibit the use of the substance in question.

Although Directive 91/414 originally established a twelve-year timeframe for the re-evaluation of active substances on the market before July 2003, the deadline has now been extended to 2008. By November 2004, evaluation had been completed for 531 of the 942 active substances included in the list of 'existing substances'; 39 active substances had been included in the annex to Regulation 91/414, while 492 were withdrawn from the list. The remaining 411 active substances were still awaiting a final decision.

Fruits and vegetables imported into the EU must comply with the relevant maximum residue levels (MRLs) for a given active substance in combination with a given commodity. In 2005, EU legislators adopted Regulation 396/05 setting out the ways in which MRLs in foodstuffs are set and controlled. The MRL Regulation consolidates existing EU legislation on MRLs into one legislative text. As with the authorization procedure for active substances, the setting of a harmonized European MRL depends on appropriate scientific data being submitted by interested parties to determine the residue results from good agricultural practices (GAP) and to evaluate consumer safety criteria. In cases where insufficient data are available to determine a MRL, the MRL remains 'open' for a limited period of time, during which data can be collected. Failing the submission of test data, the MRL is set at the lower limit of determination (LOD) – effectively close to zero.

The Regulation creates two categories of MRLs: 'definitive' tolerances, considered at EU level, and 'temporary' tolerances, set for active substances which have not yet been evaluated at EU level. The latter tolerances are based on MRLs set nationally by Member States. Temporary MRLs are gradually reviewed and, where appropriate, transferred to the 'definitive' list as active substances complete their passage through the European review process. A default MRL of 0.01 mg / kg applies to products for which no specific MRL is set and, to active substances which have been banned or withdrawn from the EU market.

To facilitate international trade, an import tolerance can be set where the use of an active substance is not authorized in the EU<sup>16</sup> or, a different MRL is appropriate because the existing EU MRL was set for reasons other than public health reasons. An import tolerance can be requested by traders wishing to import a commodity which: contains residues of a substance which is authorized in the EU but, where the commodity is not produced in the EU (this situation applies to most tropical fruits and vegetables); is treated with a substance which is no longer or not yet used in the EU; or is treated with a substance that is in use in the EU but where the foreign good agricultural practices (GAP) allow higher residues than the EU's GAP. Active substances for which an import tolerance is sought must be registered in the country of origin.

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not intended for cropping, for the purpose of protecting plants or plant products by destroying, repelling or limiting the growth of pests; destroying or limiting the growth of weeds or undesired plants; controlling or modifying the growth of plants (other than as nutrients). They include: fungicides, bactericides, insecticides, acaricides, nematocides, rodenticides, herbicides, molluscicides, virucides, soil fumigants, insect attractants (e.g. pheromones), repellents (bird, wild life, rodent, insect repellents), stored product protectants, plant growth regulators, products to improve plant resistance to pests, products to inhibit germination, products to eliminate aquatic plants and algae, desiccants and defoliant to destroy parts of plants, products to assist wound healing, products to preserve plants or plant parts after harvest, timber preservatives (for fresh wood), additives to sprays to improve the action of any other plant protection product, additives to reduce the phytotoxicity of any other plant protection product. They do not include: fertilizers and timber preservatives (European and Mediterranean Plant Protection Organization, standard defined in 2004).

<sup>16</sup> Only if the active substance is not authorized for a specific product and use for reasons other than public health reasons.

### **Implications of MRL setting in the EU for exports of tropical fruits and vegetables from developing countries**

The ongoing efforts of the EU to evaluate the safety of active substances in plant protection products and harmonize MRLs have given rise to growing concerns that developing countries will be effectively prohibited from exporting fruits and vegetables to the EU or, that compliance costs will be so high that entrance into the European market will be restricted to a limited number of larger export growers (Jaffee, 2003). Growers of tropical fruits and vegetables may be particularly hard hit by the new regulations as many of the active substances most widely used in tropical developing countries will be phased out through the authorization process and, a disproportionate number of MRLs applicable to tropical fruits and vegetables will be set at LOD (Chan, 2000; Hirst, 2001).

Indeed, many of the active substances used in developing countries are outdated, out-of-patent, low cost chemicals for which the major chemical manufacturers do not consider it worthwhile to collate the data package required for registration and authorization. Agrochemical companies have been forced to selectively defend active substances in accordance with commercial interests, focusing on those used in 'major crops' exported to large markets. None of the tropical fruits or vegetables exported by developing countries to the EU are considered to be "major crops". This gives rise to concerns that insufficient alternative treatments will be available to growers in developing countries, who are likely to be forced to use a limited range of higher cost plant protection products.

Concern has also arisen over the implications of the EU's ongoing efforts to establish harmonized MRLs. Comparisons between MRLs harmonized internationally through Codex and those set by the EU have shown that European MRLs are usually lower or equal to Codex standards, and rarely higher (Buurma, 2001; Jaffee, 2003). However, for many tropical fruits and vegetables internationally harmonized MRLs are absent altogether. Due to poor communication and a lack of understanding of the consequences of the changes, developing countries have failed to sufficiently promote the setting of MRLs for tropical fruits and vegetables, while agrochemical companies are not interested in defending MRLs for these products as their potential return on investment for research and data collection is limited (Hirst, 2001). As a result, many MRLs for tropical fruits and vegetables may be set at LOD, which effectively prohibits the application of the active substance in question. This situation is likely to lead to higher crop wastage and failure and to a reduced ability to meet market requirements for organoleptic and other quality standards, especially in tropical regions, where pest and disease pressure tends to be higher and is unrelieved by cold winters (Hirst, 2001; Jaffee, 2003).

According to analysts, the increasing stringency adopted by the EU in the authorization of active substances and the setting of MRLs may have a negative impact upon the economies of developing countries. Developing countries may be forced to reduce their use of pesticides while being unable to implement effective pest management programmes due to the limited degree of organization of their export industries. This may endanger the commercial viability of their production. Exporters in developing countries may decide to give up on small-scale growers due to the costs related to training and control of a high number of small, dispersed production units. Even if they continue to supply exporters, poorer growers may find production costs to be prohibitive when most of the older, generic and thus cheaper pesticides are withdrawn (Chan, 2000; Hirst, 2001; Jaffee, 2003).

For those countries or export growers unable to financially support the required changes, the only options are to abandon, downscale export production or, to find new outlets with less strict import requirements. Since export horticulture is a highly labour – intensive sector, any fall in production and export levels invariably results in a reduction in employment. It should be noted that many of the jobs provided by export horticulture are occupied by women. It is estimated that 75 per cent of the sector's workforce in Uganda and 90 per cent in Zimbabwe are women (Chan, 2000).

## II.3 Japan

### II.3.1 Phytosanitary

Japanese plant health requirements are governed by the Plant Protection Law, whose objective is to prevent the outbreak and/or spreading of pests on imported and domestic plants and plant products and to ensure the stabilization and development of Japanese agricultural production. The Plant Protection Law distinguishes between plants and plant products which are: banned indefinitely (see table 11 below); subjected to plant health inspection (all fruits and vegetables which are not banned) or do not require plant health inspection (including tea). All fruits and vegetables imported into Japan must be accompanied by a phytosanitary certificate issued by the country of origin. Nonetheless, if pests are found during the import inspection in Japan, the fruits and vegetables have to be treated (disinfected) or discarded, depending on the particular conditions.

**Table 11**  
**Tropical fruits prohibited indefinitely for importation into Japan**

Country of origin	Product
Jordan, Syria, Turkey, Lebanon, Africa, El Salvador, Guatemala, Costa Rica, Nicaragua, Panama, Honduras, Argentina, Uruguay, Ecuador, Colombia, Brazil, Peru, Bolivia, Bermuda, West Indies	Avocado, mango, and various minor tropical fruits including carambola, longan, litchi, passion fruit, guava, breadfruit, jackfruit, cherimoya
India, Indonesia, Viet Nam, Cambodia, Sri Lanka, Thailand, China, Pakistan, Bangladesh, East Timor, Philippines, Malaysia, Myanmar, Laos, Papua New Guinea, Micronesia	Avocado, papaya, mango, and various minor tropical fruits including a.o. carambola, rambutan, longan, litchi, passion fruit, cherimoya, guava, breadfruit, jackfruit
Easter Island, New Caledonia, Papua New Guinea, French Polynesia	Avocado, papaya, mango and various minor tropical fruits including a.o. carambola, guava, litchi, passion fruit, cherimoya

However, certain tropical fruits from a specific country of origin may be imported into Japan under bilaterally negotiated conditions of quarantine (e.g. fumigation or vapour heat treatment) and specified procedures, which may include the inspection by Japanese plant health officials of the place of production. Among the fruits and vegetables for which specific import conditions have been agreed upon, are papayas and mangoes from the Philippines, litchis from China, mangoes from Thailand and yellow pitaya from Colombia. Nonetheless, if pests are found during the import inspection in Japan, the fruits and vegetables have to be treated (e.g. disinfected or fumigated) or discarded, depending on the particular conditions.

None of the bilateral phytosanitary quarantine conditions which Japan has negotiated to date have been notified to the WTO SPS Committee nor, are these conditions available from the Ministry of Agriculture's website. Given this lack of transparency, it is conceivable that the bilateral authorization of the importation of a specific fruit or vegetable from a specific country of origin and the determination of specific plant health requirements may be influenced by factors unrelated to actual plant health risks.

### II.3.2 Sanitary

Food safety issues fall within the competences of both the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Health, Labour and Welfare (MHLW).<sup>17</sup> All Japanese ministries and agencies were reorganized in 2001. Within the MHLW, food safety now falls within the jurisdiction of the Department of Food Safety under the Pharmaceutical and Food Safety Bureau.

<sup>17</sup> An amendment of the legislation to further harmonize the responsibilities of both ministries is underway.

As in the United States and the EU, following a number of serious food safety crises that hit Japan in 2000/02, including the outbreak of bovine spongiform encephalopathy (BSE), escherichia coli infection, the detection of pesticide residues in vegetables imported from China and false labelling by food operators, the Japanese government adopted in 2003 the *Food Safety Basic Law* which provides the basic principles for Japan's food safety policy and administration. The *Food Safety Basic Law*, which became effective in July 2003, clarifies the responsibilities of national and local governments, food operators and consumers, with a view to ensure food safety 'from farm to table'. The law establishes that food business operators have primary responsibility for assuring food safety, while consumers are to be educated and involved in the policy making process. Although the law stipulates that food safety measures must be based on scientific risk assessment, it also lays down that in the case of an emergency, exceptional measures can be taken to prevent serious food borne health damages (the precautionary principle). Under the law, the Food Safety Committee (FSC), an independent advisory committee under the Prime Minister's Office, was established. The FSC performs independent risk assessment and provides scientific advice to both the MAFF, which implements measures for food safety, and the MHLW, which is responsible for risk management for agricultural, livestock, and fishery products. In addition, the FSC is charged with the implementation of risk communication among stakeholders, including consumers and food business operators and, responding to food borne accidents and emergencies.

As the Food Safety Basic Law applies to both domestic and imported foodstuffs, it is expected that food safety standards for entry into the Japanese market will become more stringent (Fukuda, 2003; Jonker et al., 2005).<sup>18</sup> In addition, the Supplementary Resolutions included in the law call for the promotion of traceability by the government. Although these Resolutions do not have any legally binding authority, they do set the tone for the future development of implementing legislation.

In the wake of the enforcement of the Food Safety Basic Law, Japan's Food Sanitation Law (under the jurisdiction of MHLW), and the laws regarding fertilizers, pesticides and feedstuffs (under the jurisdiction of MAFF) were drastically amended. The modified Food Sanitation Law establishes new specifications for pesticide residues and food additives. It provides for the development of a 'positive list' system, whereby only those substances included in the list may be present, within the legal limits, in imported foodstuffs. Products exceeding the legal limits or containing non – listed substances cannot be imported into the country. The amended law authorizes the Japanese Government to ban imports from particular countries in case of repeated violations of chemical residue standards. Japan expects foreign countries to make requests for establishing or revising MRLs for agricultural chemicals when these chemicals are newly approved in the countries for foods exported to Japan. The applicant country must submit toxicity data and residue data to support the application. The executive summary of the data package should be in Japanese; other accompanying documents, such as study reports, may be written in English.

According to Jonker et al. (2005), it is likely that the modified legislation will lead to the setting of lower MRLs, making it more difficult for foreign suppliers to comply with these MRLs. In addition, foodstuffs containing active substances for which no MRLs are set, are not allowed to enter the Japanese market.<sup>19</sup> In 2002, MRLs were established for 229 pesticides on 130 crops, while approximately 350 active substances were authorized for domestic use under the Agricultural Chemicals Restriction Law, and about 700 active substances are authorized for use by third country suppliers (Jonker et al., 2005). In addition, it is conceivable that due to financial and technical constraints, the requirement to submit a toxicity and residue data package with each application for the setting of a MRL may prove highly burdensome for developing countries wishing to export foodstuffs to Japan.

The modified Food Sanitation Law further stipulates that business operators are obliged to acquire knowledge and techniques related to food safety, conduct testing, investigate the cause of food poisoning and to retain records about food sources, to prevent the spread of food poisoning. In addition, it provides for a tightening of Japan's food safety inspection and testing system, while calling upon the MHLW to prepare and publish guidelines for inspection and guidance for imported foods. The law stipulates that persons wish-

<sup>18</sup> It is also expected that importers will increasingly call for additional documentation from suppliers (Fukuda, 2003).

<sup>19</sup> According to MHLW, a transition period will apply until May 2006, during which the current informal system for handling pesticides for which no MRLs have been set will continue.

ing to import foodstuffs must notify the MHLW prior to each importation. Food inspectors at the quarantine station of the port or airport where customs clearance takes place examine the notification and systematically inspect the imported foodstuffs. Products which are found to violate the law are discarded, reshipped, or otherwise treated.

## II.4 Canada

### II.4.1 Phytosanitary

Like all imported plants and plant products, tropical fruits may be subjected to inspection by Canadian plant health officials upon arrival in Canada, to establish whether the products are free from pests, soil, sand, leaves and plant debris. Tropical fruits are exempt from further Canadian phytosanitary import requirements, as these fruits are not normally expected to harbour plant pests that could become established in Canada. No phytosanitary certificates or permits to import are required.

### II.4.2 Sanitary

Canada's food safety policy is governed by the Food and Drugs Act (FDA) of 1953, which prohibits the production and sale of unsafe or adulterated foodstuffs in the country. The Act is supplemented by a wide body of regulations that lay down specific requirements for the safety and nutritional quality of foodstuffs. All fruits and vegetables imported into Canada from third countries must comply with these requirements.

Canada's food safety regime is based upon three fundamental principles: the health of the population is paramount; policy decisions must be based upon scientific evidence and, all sectors and jurisdictions must collaborate to protect consumers.

In 1994, the Canadian federal and provincial governments adopted the *Blueprint Document for the Canadian Food Inspection System* (CFIS), a guidance document aimed at developing an integrated, risk based food inspection system to guarantee the supply of high quality, safe food to Canadian consumers. A CFIS Implementation Group was established to develop harmonized national standards and codes of practices.<sup>20</sup>

In 1997, all federal food, plant and animal health inspection and quarantine services formerly provided by the Departments of Agriculture and Agri – Food Canada (AAFC), Health Canada (HC), Fisheries and Oceans Canada and Industry Canada, were merged under one inspection body, the Canadian Food Inspection Agency (CFIA). Among the objectives of the reform were to clarify responsibilities in the field of food safety and to improve service efficiency by reducing overlap and duplication. Under the CFIA Act, HC is responsible for the establishment of food safety standards and policy, for risk assessment related to food safety and human health, for the prioritization of policy issues, for food borne disease surveillance and, for the evaluation of the effectiveness of CFIA's food safety initiatives. The CFIA, which reports to the Department of Agriculture and Agri – Food, is responsible for the enforcement of the policies and standards established by HC, as well as for risk assessment and risk management in the areas of animal and plant health protection.<sup>21</sup>

In 1990, following concerns from farmers, pesticide manufacturers and consumers, a multi -- stakeholder Pesticide Registration Review Team was created to develop recommendations for improving the country's federal pesticide regulatory system. In 1995, the Canadian Government created the Pest Management Regulatory Agency (PMRA), within the Department of Health, in response to the recommendations of the team. The remit of the PMRA is to protect human health and the environment by minimizing risks asso-

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<sup>20</sup> In 2004, the Group adopted the Canadian Code of Practice – General Principles of Food Hygiene, which lays down good manufacturing and hygiene practices to be applied by the food industry in Canada.

<sup>21</sup> The Minister of Agriculture and Agri - Food retains responsibility for establishing standards related to animal and plant health.



ciated with the use of pesticides. It is responsible, on behalf of the Minister of Health, for the establishment of MRLs under the Pest Control Products Act (PCPA). A new Pest Control Products Act (PCPA) received Royal Assent in December 2002, and will come into force on a date yet to be determined. While the new Act is aimed at modernizing pesticide regulation and increasing the transparency of the pesticides registration system, it is likely that the Act will reduce the number of active substances authorized for use on foodstuffs consumed in Canada, be they produced domestically or imported from abroad. Indeed, the Act will provide the PMRA with the authority to remove pesticides from the market if the data required for supporting their application for registration are not supplied. In addition, the Act will require the re - evaluation of pesticides after they are registered.

To address emergency situations, the Public Safety Act was adopted in 2002, to provide new powers to several Ministers, including the Health Minister, to issue *emergency interim orders*. An *emergency interim order* can be applied in cases where there are grounds to believe that immediate action is required to address a significant risk to human life, health and safety (the precautionary principle).

Health Canada has recently issued the draft Canada Health Protection Act (CHPA), based upon a General Safety Requirement (GSR), which lays primary responsibility for food safety with food business operators. Under the GSR, food operators, including importers, would be obliged to evaluate the safety of a product before putting it on to the market. Failure to comply with any of the food safety obligations under the GSR would constitute a criminal offence.

The adoption and implementation of the CHPA is likely to lead to a tightening of food safety requirements imposed upon foodstuffs imported into Canada from third countries. While the GSR would not prevent the establishment of regulatory standards for food safety and nutritional quality, it would operate as a safety net where such regulatory standards do not exist. With the GSR, a standard could be legally enforced even if it is not incorporated in the regulations. The GSR would thus allow the Canadian government to enforce a standard that is generally accepted as the practice by an industry sector, without going through the legislative process required for issuing a regulation.

An industry standard that would be a prime candidate for enforcement through the GSR is HACCP. The development and implementation of HACCP – based food safety control programmes dates back to the late 1980s. The introduction and development of these programmes is accomplished through voluntary industry participation, backed by funding, scientific advice and support from the Canadian Government. Packers, transporters, distributors, wholesalers and retailers are encouraged to participate, on a voluntary basis and in partnership with the government, in the development and spreading of HACCP – based food safety control programmes, e.g. through the Agricultural Policy Framework (APF) developed by AAFC.

### III. THE SPS AGREEMENT AND ITS SIGNIFICANCE FOR DEVELOPING COUNTRIES

Prior to the Uruguay Round, trade in agriculture was effectively excluded from the multilateral trading system. The Uruguay Round brought discipline into agriculture trade, notably by countries agreeing to tariffify<sup>22</sup> non-tariff barriers on agricultural products, and reduce tariffs and production and export subsidies.<sup>23</sup> However, these attempts at liberalizing their economies were accompanied by an increase in Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT).

To the extent that countries have the right to protect human, animal and plant life or health in their territories by ensuring that imported goods meet certain quality requirements, these measures are both morally and legally justifiable. Therefore, it is clearly understood that each country has the right, and indeed imposes, SPS measures. However, concerns were raised during the GATT negotiations that member countries were using them to shield their national industries from foreign competition. Therefore, when establishing the rules of the World Trade Organization in 1995, member countries adopted an Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). The SPS Agreement is a set of multilateral rules that recognize the need for countries to take measures necessary for the protection of human, animal or plant life in their territories, as long as these are not used as disguised restrictions to trade, or in a manner that is discriminatory, arbitrary or unjustifiable. This section describes the SPS Agreement and its significance for developing countries.

#### III.1 The SPS Agreement

The SPS Agreement is part of the Agreement Establishing the World Trade Organization (the 'WTO Agreement'). As with any Agreement of the WTO, in cases where countries fail to resolve disputes bilaterally, they may resort to various dispute settlement mechanisms, including good offices, conciliation, mediation and arbitration. In a dispute under the SPS Agreement, the dispute settlement panel may seek scientific or technical advice from experts before submitting its recommendations to the WTO Dispute Settlement Body. Unless the latter unanimously rejects the panel's report, the defendant is obliged to implement the panel's recommendations.

The WTO Agreement establishes a Committee on Sanitary and Phytosanitary Measures to monitor the implementation of the provisions of the SPS Agreement and further its objectives. The Committee serves as a platform for consultation and negotiation between countries on specific sanitary or phytosanitary issues, and maintains close cooperation with relevant international organizations, and especially with the Codex Alimentarius Commission, the International Office of Epizootics and the secretariat of the International Plant Protection Convention.

The rights and obligations of countries signatories to the SPS Agreement are based on five pillars: harmonization, equivalence, regionalization and appropriate levels of protection and transparency.

Under the first pillar of the SPS Agreement, *harmonization*, countries are expected to base their sanitary and phytosanitary measures upon international standards, guidelines or recommendations, where they exist. The Agreement specifically refers to the work of the 'three sisters', the Codex Alimentarius Commission (Codex) on food safety, the International Office of Epizootics (OIE) on animal health and the Interna-

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<sup>22</sup> 'Tariffication' refers to the process of converting non-tariff barriers to their tariff equivalent.

<sup>23</sup> Tariff peaks, tariff escalation, and subsidies remain problematic and are high on the agenda of the ongoing negotiations on Agriculture under the Doha Work Programme.

tional Plant Protection Convention (IPPC) on plant health. In this paper, an SPS measure is considered ‘harmonized’ if it is based on the recommendations of at least one of the above ‘sisters’.

Where international standards do not exist, countries are required to justify their standards. Countries have the right to choose their own appropriate level of protection, which may be higher than international norms, without necessarily violating its principles. Trade analysts have argued that in practice this provision means that the work of the ‘three sisters’ does not function as a floor nor ceiling to national regulations (Stanton, 1994). Indeed, the lack of agreement between countries has in occasions given rise to international trade disputes.

The second pillar of the SPS Agreement is the concept of *equivalence*, whereby countries are expected to recognize the measures of other countries as equivalent to theirs, if they provide ‘*the same appropriate level of sanitary or phytosanitary protection*’. During the process of setting up equivalences or, during disputes where a country believes that the equivalence of its system should be recognized, countries are expected to grant access to carry out on-site inspections and product testing by the interested parties.

The third pillar of the SPS Agreement is *regionalization*. Countries are required to adapt their sanitary and phytosanitary measures to the specificities of the area – all of a country, part of a country or all or parts of several countries – wherefrom a product originates. They shall not unnecessarily restrict imports from pest- or disease-free areas or areas of low pest or disease prevalence. Reasonable access shall be granted to importing countries to establish the pest or disease status of a particular area. Many SPS notifications in fact relate to the need to update the areas from which specific products can or cannot be imported.

In general it is recognized that the potential benefits of harmonization are large in comparison with those of regionalization or equivalence, as they allow for greater economies of scale in adjusting national production structures. In spite of this potential, the impact of harmonization upon international agricultural trade is limited by the lack of international standards. Roberts et al. (1999) indicate that the vast majority of SPS measures notified to the WTO from 1995 to 1999 had no international standard. With a particular reference to fruits and vegetables, Roberts and Krissoff (2004) indicate that no international standard existed for 70 per cent of food safety notifications submitted between 1995 and 2000. According to the authors, the fact that international standards are a public good has led to underinvestment in their development. This in turn results not only in a lack of international standards but also in many outdated standards, which may account for their limited adoption by WTO members (Roberts and Krissoff, 2004).

The fourth pillar of the SPS Agreement is the *appropriate level of protection*. Countries are required to base their sanitary and phytosanitary measures upon an appropriate assessment of risks to human, animal or plant life or health, using techniques developed by relevant international organizations. As argued above, the Agreement recognizes the right of countries to choose their own appropriate level of protection, responding to social and cultural sensitivities (Stanton, 1994). Though countries are required to ensure that the measures are not more trade distorting than required, the SPS Agreement allows countries to provisionally adopt protective measures in cases where scientific evidence is insufficient to allow for a technical and economic assessment of the risks associated with the importation of a certain product.

The fifth and final pillar of the SPS Agreement is *transparency*. ‘*Countries are required to notify and publish all sanitary and phytosanitary measures which may directly or indirectly affect international trade in a timely manner, to allow trading partners to become acquainted with them*’. In practice this translates into countries being required to clearly spell out their SPS measures, to put in place enquiry points to respond to requests for information or clarification from interested countries and, to notify changes in their systems to the WTO.

### III.2 The SPS Agreement and Developing Countries

Participating in the WTO is expensive for countries: it requires logistical resources and multidisciplinary, high level technical expertise. This is also true of the SPS Agreement, which requires countries to constantly monitor and analyse the possible impact of notifications on their economies. The SPS Committee serves as a

forum where countries can discuss SPS – related difficulties or challenge other countries' proposed or already implemented SPS measures, but unfortunately developing countries do not fully exploit these possibilities (Zarrilli, 1999) because they do not dispose of the financial, human and technical resources necessary for effective participation (Jensen, 2002).

Developing countries are often unable to keep track of, assess and comment upon notifications submitted by their trading partners. Official bodies in developing countries are often unable to correctly assess the economic impact of a regulatory measure due to the lack of effective communication channels between government institutions and the private sector. Developing countries have complained that even when they were able to comment on a proposed regulation, those comments were not taken into account by the notifying country (Jensen, 2002; Zarrilli, 1999). Jaffee and Henson (2002) argue that these difficulties are magnified by the intrinsic complexities of managing food safety and animal and plant health within fast evolving international agricultural trade patterns.

In signing the SPS Agreement, countries agree to provide technical assistance, especially to developing countries, to allow them to adjust to and comply with SPS requirements in their markets (Art 9 of the SPS Agreement). Such assistance may take the form of advice, credits, donations and grants or, training and equipment to develop technologies, undertake research or set up infrastructure, including the establishment of national regulatory bodies. Countries are supposed to take account of the special needs of developing countries, and especially least developed countries (LDCs), when setting and applying sanitary and phytosanitary measures, for example by allowing them longer time frames for compliance.

Representatives of developing countries to the WTO have argued that both the level and type of technical assistance provided by developed countries has been inadequate. This is partly due to the vagueness and lack of commitment in the formulation of Art 9 (Jensen, 2002), as well as to the lack of a systematic and concerted approach to the provision of technical assistance by developed countries (NRI, 2000; Jensen, 2002). Notably, the development of an efficient food safety and agricultural health management system is closely related to the availability of wider technical, administrative and scientific capacities, which reflect the overall level of economic development of a country. Examples include the capability to undertake epidemiological surveillance and risk assessment, access to accredited laboratories and internationally recognized systems for certification (Jaffee and Henson, 2004). According to Jensen (2002), these problems are difficult to solve with technical assistance, which is 'more appropriate for isolated problem solving within an overall sound standards infrastructure'.

### *Transparency*

The SPS Agreement is in constant operation, as the number of SPS measures increase due to novel pests and diseases, scientific progress and trade diversification. Since its inception, signatory countries have intensified their efforts to improve the transparency of their official regulatory actions on food safety and animal and plant health, not only warning countries of changes but also allowing them to comment on proposed measures, either bilaterally or through the Committee. Nearly 5 500 SPS notifications were submitted to the Committee from the entry into force of the SPS Agreement and until December 2004, and the annual rate of submission is increasing. In addition, many countries have opened websites where information regarding the SPS requirements can be obtained. While all OECD countries had installed a central enquiry point by 1995 and designated notification authorities since 1997 (OECD, 2002), the participation of developing countries in the implementation of the SPS Agreement continues to be limited.<sup>24</sup>

Although the transparency of national food safety and agricultural health measures has increased since the implementation of the SPS Agreement, developing countries have suggested that the way in which the transparency principle has operated to date does not take due account of their special circumstances. In particular, it has been argued that in many cases the length of time between the notification of a new SPS measure and its effective implementation is inadequate for developing countries to adapt their products to new

<sup>25</sup> Whilst many African or least developed countries hardly participate in the SPS Agreement, other – mainly middle income – developing countries are relatively active. Examples include Argentina, Brazil, Uruguay, Chile, South Africa, the Philippines and Thailand.

requirements (Henson and Loader, 2001). Making SPS measures more transparent does not necessarily mean that their impacts are less damaging to the economies of those trading partners that face costs of compliance beyond their means.

#### *Harmonization*

Due to harmonization, the ability of countries to participate in international standard setting procedures (Codex, IPPC and OIE) is crucial to preserve their commercial interests (Jensen, 2002). Henson and Loader (2001) indicate that only one third of low – and middle – income countries are members of all three standard setting organizations referred to in the SPS Agreement, compared to nearly two thirds of upper middle – and high – income countries. As a result, it has been argued that international standards may not take due account of their special needs and interests (Jensen, 2002; Zarrilli, 1999), which may constitute a barrier to participate in export markets. As far as tropical fruits and vegetables are concerned, interviews carried out by the author with FAO staff indicated that only major exporters, such as Mexico and Brazil, actively participate in Codex.

#### *Equivalence*

The SPS Agreement obliges countries to accept the SPS measures of other countries as equivalent, if the exporting country demonstrates that its measures achieve the importing country's appropriate level of sanitary and phytosanitary protection (Art 4.1). However, developing countries have repeatedly indicated the reluctance of developed countries to recognise their SPS measures as being equivalent. Rather than adopting the principle of equivalence, developed countries look for 'sameness'. In other words they require strict compliance with the letter of their requirements (Zarrilli, 1999; Henson and Loader, 2001). According to Zarrilli (1999), equivalence would significantly enhance developing countries' access to developed markets when international standards are lacking or harmonization is inappropriate in view of specific climatic, developmental and technological conditions faced by developing countries.

#### *Regionalization*

The principle of regionalization as stipulated in the SPS Agreement is based on the recognition that many sanitary and phytosanitary problems, including the prevalence of pests and animal and plant diseases, do not follow national borders. It is of particular relevance for large developing countries, where climatic and epidemiologic conditions may vary considerably from one region to another. According to Zarrilli (1999), proving that a particular area is free of a pest or disease is highly demanding in terms of time and technical knowledge. It has therefore been suggested that the capacity of developing countries to take advantage of this possibility remains limited.

#### *Dispute Settlement*

The lack of financial and human resources and technical knowledge deters many developing countries from participating in the WTO – often lengthy - dispute settlement process. Jensen (2002) suggests that the ability of a country to carry a complaint through the entire dispute settlement procedure is positively correlated with the income level of that country. Of the 49 issues raised in the SPS Committee from 1995 to 2004, 14 cases related to a concern raised by a developed country regarding a measure proposed or maintained by another developed country. Fifteen issues related to a concern raised by a developed country regarding an SPS measure proposed or maintained by a developing country, while 13 issues were raised by developing countries regarding an SPS measure proposed or maintained by a developed country. Only six cases concerned an issue raised by a developing country regarding an SPS measure maintained or proposed by another developing country.

Roberts and Krissoff (2004) identified only four dispute settlement procedures on fruits and vegetables from 1995 to 2004. In 2001, Ecuador requested consultations on import procedures for fresh fruit in Turkey. In 2002, the United States filed a request for consultations on measures affecting the importation of apples in Japan, while the Philippines requested consultations on certain measures affecting the importation of fresh pineapples and other fruits and vegetables into Australia.

### III.3 SPS Notifications Submitted by QUAD Countries

#### *Number of Notifications*

The total number SPS notifications has consistently grown through the years, and the annual rate of submission increased from 198 in 1995 to 920 in 2004. By December 2004, a total of some 5 300 notifications had been submitted to the Committee. Notifications on fruits and vegetables in general, and on (tropical) fruits and vegetables in particular, have followed a similar upward trend: a total of 888 notifications, increasing from 29 in 1995 to 170 in 2004. Their share of the total has remained stable through the years (10 per cent), suggesting that the import requirements of these products have evolved in a similar fashion to those of other agricultural products. The number of notifications specific to tropical fruits and vegetables<sup>25</sup> increased from two in 1995 to 27 in 2004. By the end of 2004, a total of 197 notifications relating to tropical fruits and vegetables had been submitted to the Committee (Table 12).

Notifications on fruits and vegetables submitted by QUAD countries increased from seven in 1995 to 121 in 2004. This represents an increase from 24 to 71 per cent of the total on fruits and vegetables, and therefore an increasing predominance of notifications from QUAD countries. Conversely, the share of QUAD countries in total notifications specific to tropical fruits and vegetables is limited, ranging from a minimum of three per cent in 2002 to a maximum of 33 per cent in 2000. This is most likely due to the limited interest of QUAD countries in the domestic production of tropical fruits and vegetables and, the resulting low importance attached by these countries to plant health issues related to these products. Indeed, most notifications specific to tropical fruits and vegetables were in fact submitted by developing countries.

**Table 12**  
**Notifications to the SPS Committee (1995 – 2004)**

	TOTAL SPS NOTIFICATIONS	NOTIFICATIONS ON F&V	NOTIFICATIONS ON F&V BY QUAD	NOTIFICATIONS ON TROPICAL F&V	NOTIFICATIONS ON TROPICAL F&V BY QUAD
1995	198	29	7	2	0
1996	241	32	21	6	1
1997	272	32	15	12	2
1998	335	36	17	12	1
1999	443	57	33	36	6
2000	464	87	73	12	4
2001	769	120	86	27	7
2002	803	156	111	36	1
2003	852	169	115	27	6
2004	920	170	121	27	5
	5297	888	599	197	33

Some of the notifications are general in nature and affect tropical fruits and vegetables as much as other products. Adding them to the above figures results in a total number of submissions by QUAD countries of 154. These increased from two in 1995 to 27 in 2004, with a record number of 34 in 2003. The submission

<sup>25</sup> Based on research carried out in WTO's 'Documents Online'. The notifications on tropical fruits and vegetables include all notifications, specifically mentioning avocados, mangoes, papayas, pineapples, tropical fruits or sweet potatoes. They do not include notifications that cover fruits and vegetables (including tropical fruits and vegetables) in general.

by country has been notoriously different; out of these 154 notifications, 91 were from the United States, 46 from the EU, 14 from Japan and three from Canada (Table 13).

**Table 13**  
**Notifications affecting tropical fruits and vegetables submitted by QUAD countries (1995-2004)<sup>26</sup>**

	UNITED STATES		CANADA		EU		JAPAN		TOTAL
	MRL	OTHER	MRL	OTHER	MRL	OTHER	MRL	OTHER	
1995		1			0	0	0	1	2
1996	1	2			1		1		5
1997		2	1		0		1		4
1998	1	1			1		1		4
1999	3	1	2		2		2		10
2000	10	4			9		1		24
2001	10	7			7		1		25
2002	6	4			8	1			19
2003	22	5			6		1		34
2004	6	5			11		5		27
<b>TOTAL</b>	<b>59</b>	<b>32</b>	<b>3</b>	<b>0</b>	<b>45</b>	<b>1</b>	<b>13</b>	<b>1</b>	<b>154</b>

#### *Nature of Notifications*

There is a notorious predominance of notifications related to the setting of maximum residue levels (MRLs) for pesticides in and on tropical fruits and / or vegetables (120) relative to other food safety and plant health issues (34). Of the total 120 notifications related to the fixing of MRLs, 103 were submitted in the period 2000 – 2004, while only 17 notifications were submitted during the first five years of operation of the SPS Committee, indicating that QUAD countries have become more active in the field of MRL setting.

Over the period 1995 – 2004, the United States submitted 30 notifications relating to plant health issues, while the EU, Canada and Japan did not submit any plant health notifications. A possible explanation for the high number of notifications on plant health issues by the United States is to be found in the nature of the United States plant health regime, which in principle prohibits the importation of all plants or plant products. It is only after a pest risk assessment has demonstrated that the importation of a specific fruit or vegetable from a particular country of origin does not present unacceptable risks to United States plant health that an import permit may be granted. Under this system, each product / origin combination that is allowed for importation into the United States gives rise to a modification of plant health regulations and thus to an SPS notification. This may account for the high number of plant health notifications submitted by the United States. In addition, as a result of this regime, most notifications submitted by the United States in the field of plant health are authorizations of imports of a particular product / origin combination, relaxing existing import restrictions. Conversely, plant health notifications submitted by the EU generally create new import restrictions.<sup>27</sup> This can be explained by the fact that all fruits and vegetables can in principle be imported into the EU, unless a particular product / origin combination presents a specific plant health problem, in which

<sup>26</sup> Based on WTO's 'Documents Online'. Contrary to the notifications studied in the above analysis, these notifications include both notifications that refer specifically to one or more of the tropical fruits or vegetables studied in this paper and, to general notifications related to imports of all fruits and vegetables.

<sup>27</sup> It is important to note that the trade – expanding nature of the United States SPS notifications, and the trade – restricting nature of those of the EU, does not necessarily indicate that the United States plant health regime is less restrictive than that of the EU.

case imports are restricted. The fact that the EU did not submit any plant health notifications related to tropical fruits and vegetables over the period 1995 – 2004 therefore seems to indicate that no particular plant health problems arose during that period.

#### *Harmonization*

In terms of harmonization, there is a net predominance of notifications not based on internationally agreed standards. This indicates that there is a clear gap between the food safety and plant health requirements imposed by QUAD countries and those available in Codex and IPPC. Of the total 154 notifications related to tropical fruits and vegetables submitted from 1995 to 2004, only 32 were based on internationally harmonized standards. Ninety notifications clearly indicated that the notified measure was not based on harmonized standards, while 29 notifications were partially harmonized, meaning that they notified both harmonized and non – harmonized measures (Table 14).

**Table 14**  
**Harmonized and non – harmonized notifications on tropical fruits and vegetables by QUAD countries (1995 – 2004)**

	UNITED STATES		CANADA		EU		JAPAN		TOTAL
	MRL	OTHER	MRL	OTHER	MRL	OTHER	MRL	OTHER	
Harmonized	2	28			1	1		0	32
Non - harmonized	52	4	3		21		9	1	90
Partially harmonized	2				23		4		29
Not indicated	2								2

Most non-harmonized measures fall within the setting of MRLs. This may be due to either a lack of internationally harmonized MRLs, or to a failure of QUAD countries to adopt such MRLs. Of the total 120 notifications related to the fixing of MRLs, only three were based on MRLs set by Codex and the rest concerned the setting of either partially harmonized or non-harmonized MRLs.

Most notifications relating to plant health issues were based on internationally harmonized measures set by the IPPC. A majority of these harmonized plant health measures merely referred to paragraph 1 of article VI of the International Plant Protection Convention, which authorizes contracting parties to require phytosanitary measures provided such measures are no more stringent than measures applied to the same pests within the territory of the contracting part, and, are limited to what is necessary to protect plant health and can be technically justified by the contracting party.



#### IV. THE COSTS OF COMPLYING WITH SPS REQUIREMENTS

The proliferation and increasing stringency of food safety and plant health requirements imposed by developed countries have led to growing concerns amongst many developing countries as to their administrative, technical and financial capacities to comply with these requirements. More specifically, concerns are that the financial costs related to the transformation and upgrading of the supply chain in order to comply with SPS requirements may exceed financial capacities of developing country suppliers, affecting their competitive positioning, and in certain cases effectively prohibiting their access to developed country markets. In addition, frequently changing SPS measures may create uncertainty and confusion amongst growers and exporters in developing countries. Uncertainty regarding the possible imposition of new SPS measures or the tightening of existing measures may be a disincentive for compliance by economic actors in developing countries, even when they have the technical and financial capacity to comply. This has led to increasing concerns regarding the further marginalization within international trade of weaker economic actors, including least developed countries, small businesses, and smallholder farms.

Estimating the costs of compliance with SPS requirements for developing countries is problematic. Hard data on compliance costs are sparse, and the few available estimates focus on the costs of compliance with quality and safety standards set by larger private customers,<sup>28</sup> rather than those related to requirements imposed through public legislation (see e.g. World Bank, 2005; Jaffee, 2003).

Developing countries face various types of costs of compliance with SPS requirements. The World Bank (2005) distinguishes between non-recurring and recurring costs (e.g. the one-off costs of upgrading processing facilities vs. the recurring costs of collecting and analysing samples in laboratories) and between tangible and intangible costs (e.g. the costs related to upgrading laboratory infrastructure vs. the costs related to reduced investment in domestic food safety controls). Failure to identify and distinguish between these costs results in incomplete estimates of the compliance costs related to SPS measures.

A number of additional difficulties complicate the correct estimation of compliance costs. First, compliance costs should be isolated from more general costs related to developing and maintaining a modern horticultural operation, such as for example the costs related to improving general hygiene conditions in packing stations. Second, compliance costs are imposed on both public authorities and private operators. Public administrative structures may need to be improved and government controls may need to be strengthened, while private operators may need to upgrade their food safety strategies. Public and private actions may substitute for each other (e.g. public vs. private research institutions) or, complement one another (e.g. sharpened government testing vs. upgraded food safety systems at enterprise level). Third, compliance costs vary considerably between countries, depending *inter alia* upon the existing organization of the supply chain and existing administrative and technical capacities, as well as between individual enterprises facing different starting points for compliance, depending upon previous investments in agricultural health and food quality and safety.

Compliance with SPS requirements not only entails costs, but may also generate important benefits for developing countries and their private operators. The most evident benefit of compliance for developing countries is of course continued access to export markets. Additional potential benefits for the exporting country include *inter alia* increased production efficiency, less waste losses and, improved working conditions for agricultural workers through better hygiene or a more responsible use of pesticides. In addition to

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<sup>28</sup> A growing number of European retailers are requiring their overseas suppliers to be certified for compliance with EurepGAP. The EurepGAP Protocol for Fresh Fruit and Vegetables encourages farmers to apply good agricultural practices, including measures geared toward the reduction of the use of chemicals, the protection of the environment, and the improvement of workers' safety and welfare.

these direct benefits, SPS compliance may also generate beneficial 'spill-over' effects for the population of the exporting country. The development and maintenance of the infrastructure required for SPS compliance may stimulate the demand for local supplies and technical services, and create additional jobs. Meanwhile, local consumers may benefit when growers and governments implement measures to ensure increased food quality and safety. In this view, 'improved food safety and agricultural health is both a national and international good' (World Bank, 2005).

As argued above, the few attempts made until now to identify and quantify costs and benefits of SPS compliance focus on compliance with private requirements as opposed to requirements imposed by law. There is an urgent need for further research into the identification and estimation of the costs related to compliance with the latter requirements. However, the growth in exports of tropical fruits and vegetables from developing countries witnessed over the past decade indicates that developing countries as a group have managed to maintain their access to developed country markets, despite the proliferation and increasing stringency of SPS requirements in these markets.

While SPS compliance benefits seem to outweigh costs for developing countries as a group, these costs and benefits may be distributed unevenly between countries and, between operators within those countries. Identifying and quantifying the distribution effects of SPS compliance is problematic, as these effects are interlinked, and there may be several 'rounds' of effects over time. Research carried out by the World Bank (World Bank, 2005) allows the identification of a number of ways in which the costs and benefits of compliance affect developing countries and their operators.

At the international level, concerns are that lower income countries with limited financial, human and technical resources may be unable to comply with SPS requirements imposed by developed countries, and thus be marginalized in international trade. However, the evidence supporting this concern is rather weak. Exports of tropical fruits and vegetables were concentrated in a limited number of lower middle income and upper middle income countries well before the rise in SPS requirements in developed countries in the 90s, while LDCs have always been virtually excluded from international trade in tropical fruits and vegetables. According to the World Bank, there is little evidence to suggest that the rise in SPS requirements as a separate factor has had a significant impact upon horticultural exports from developing countries. However, the World Bank also indicates that small countries supplying niche markets are far more vulnerable to market exclusion and loss of reputation following a food safety problem than large exporting countries supplying more mainstream products.

At the national level, there are fears that smaller exporters and smallholder farmers may be unable to comply with increasingly stringent SPS requirements due to their limited financial resources, and thus be excluded from export supply chains. Smaller enterprises may be at a disadvantage in comparison with their larger competitors when compliance with SPS requirements entails economies of scale or requires specialised technical knowledge. Experience from the COLEACP - PIP programme (see box below) illustrates that the lack of information and training regarding the EU's food safety requirements is one of the main handicaps faced by smallholder farmers in developing countries. In addition, smallholder producers may find it difficult to obtain credit, which is often only available to large growers. In some cases, small farmers have been forced to cut back on production due to a lack of financial resources, for example to buy the required phytosanitary products (COLEACP, 2004). According to Stanford (2002), the phytosanitary requirements imposed by the USDA upon Mexican avocado production effectively limited access to the United States avocado market to a limited number of 'elite' growers, representing less than one per cent of Mexico's total 6 000 avocado growers.

While these experiences support concerns that smallholder farmers and smaller exporters may be negatively affected by rising SPS requirements, the World Bank also argues that smallholders operating in favourable geographic circumstances, with adequate infrastructure and in the context of strong producer organizations, may well be able to implement the necessary technical adjustments and investments to comply with these SPS requirements. The experience of the Kenyan horticultural sector (see p. 51) shows that public policy can be decisive in determining whether growers lose or gain from SPS compliance.

Compliance with SPS requirements may have wider spill-over effects into the local economy of the exporting country. As argued earlier, local consumers may benefit when producers and authorities implement measures to improve food safety and safeguard agricultural health. The investments related to SPS compliance may stimulate the demand for local supplies and technical services. Domestic consumers may be affected when the production of foodstuffs for local consumption competes for resources with that of foodstuffs for exports. Local residents may be affected, negatively or positively, by the environmental and social impact of prescribed production methods.

**Box**

**Beyond the Cost Debate: SPS Standards as Catalysts**

It has been argued that SPS requirements may, in certain circumstances, function as a ‘catalyst’ for competitive repositioning and enhanced export performance of developing countries (Jaffee and Henson (2004) and Jaffee (2003). In this view, SPS standards, be they public or private, can serve as a ‘bridge’ between developing country suppliers and increasingly demanding, distant consumers. A case in point is the transformation of Kenyan horticultural exports to the EU, which started in the second half of the 90s (see Jaffee, 2003). It illustrates that developing countries with limited resources can develop the regulatory and administrative framework to comply with public and private SPS requirements in developed country markets, and, even turn them into a competitive advantage in supplying precisely those market segments that are most demanding in terms of food quality and security. The transformation of the Kenyan horticultural supply chain has required – and will continue to require - considerable private investments to adjust production, packing and logistic operations, supplemented by actions developed by the Kenyan government and private sector organizations (Jaffee, 2003).

The extent to which this ‘standards – as – catalysts’ perspective materializes crucially depends upon the capability of developing countries to adjust and modernize their supply chains to comply with requirements, and to demonstrate compliance. This capability in turn depends upon the human and financial capacities of governments and administrations to perform regulatory, research and management (e.g. inspection) functions, which in many cases reflect the overall level of economic development of a country. To ensure that government intervention responds to the needs and constraints of private operators, it is of paramount importance that public authorities and the private sector engage in an open and sustained dialogue. Such a dialogue allows private operators to air their concerns and ensure that they are taken into account by the authorities in the development of policies and actions. Since they are well informed about technical capacities and constraints, private operators can make an important contribution towards the identification of deficiencies in the sector’s capacity to meet export markets’ SPS requirements and the development of appropriate actions to remedy these deficiencies.

The process of modernization and adjustment of the Kenyan horticultural export industry would not have been possible without the intense collaboration within the private industry and between the industry and the Kenyan government. In 2002, the Kenyan Ministry of Agriculture set up a National MRL Steering Committee, to address the challenges created by the changing EU legislation on maximum residue levels (MRLs). In 2004, the Committee was renamed National Task Force on Horticulture, to reflect its broadened scope of activity. The Task Force, which comprises government ministries, industry associations, producers, exporters, service providers and pesticide manufacturers, aims at ensuring that Kenya’s horticultural exports comply with public and private requirements in the field of SPS and traceability in the EU. The Task Force serves as a unique platform where all stakeholders can jointly discuss matters of concern to the industry. These discussions, which usually take place once a month, have allowed for the development of a collaborative approach towards the challenges faced by the industry, thus reducing the sometimes hostile relationship between some actors. The Taskforce is chaired by KEPHIS, the Kenyan Plant Health Inspectorate Service, which recently became an official WTO enquiry point for SPS issues (COLEACP, 2005).

A significant development in the process of transforming Kenya’s horticultural export sector has been the approval, in April 2002, of the Code of Practice for the Horticultural Industry, by the Kenya Bureau of Standards. The Code prescribes the requirements for the responsible and safe production of horticultural products, with a particular focus on export – oriented production. It encompasses elements of Good Agricultural Practices, product quality management, hygiene and food safety management, supply chain management and traceability, environ-

mental protection and worker safety and social management, blending both public and private food quality and safety requirements. The gradual implementation of the Code will undoubtedly be instrumental in ensuring the compliance of Kenya's horticultural export industry with public and private requirements in the EU.

The analysis of the transformation of the Kenyan horticultural export industry and a study of the available literature (see e.g. Willems et al., 2005, and Gujadhur, 2003) allows us to draw a number of important lessons on how developing countries can best tackle SPS requirements imposed upon their exports to developed country markets.

- ◆ National governments should create an *enabling export environment* by providing reliable and efficient quality and safety control services, including the establishment of reliable laboratories; by developing harmonized regulations and monitoring practices; by setting up research institutes and, by providing adequate transportation and communication infrastructure.
- ◆ *Producers and exporters must be informed of changes in target markets' SPS requirements.* This could be done through the establishment of national monitoring systems, alerting business operators of SPS notifications submitted by importing countries. The Brazilian public authorities have developed a tool called 'Alerta Exportador', which enables exporters to receive daily updates, via email, of new WTO notifications on technical regulations and conformity assessment procedures. Similar systems could be developed to cover notifications relating to SPS regulations.
- ◆ *National governments should engage in a dialogue and collaborate with the private sector* to adequately identify deficiencies in the sector's capacity to meet SPS requirements and develop and implement appropriate actions to remedy these deficiencies. An effective government – private sector partnership requires a high degree of organization and cooperation within the private sector, e.g. through the establishment of industry associations that can voice the concerns of private operators.
- ◆ The private industry and public authorities should work towards the *standardization and harmonization of production and handling processes* e.g. through the development of voluntary or mandatory codes of practices which may blend public and private market requirements of both domestic and export markets.
- ◆ Producers, and especially small – scale farmers, should be *trained* on issues such as HACCP, the safe and effective use of pesticides, food safety, Good Agricultural Practices etc, and assisted in acquiring a practical *understanding* of developed countries' requirements in these fields (cfr p. 51: 'The Way Forward: the PIP Experience').
- ◆ *Coordination between business operators in exporting developing countries and importing developed countries* can significantly facilitate access to export markets. A good example is COLEACP, the Liaison Committee Europe – Africa–Caribbean–Pacific (ACP), an interprofessional organization of exporters, importers and other stakeholders in ACP – EU horticultural trade, financed by the EU. The organization provides a platform for discussion and exchange of experiences between ACP exporters and producers of horticultural products and their buyers in the EU.

### **The Way Forward: the PIP Experience**

To assist fruit and vegetable producers and exporters in African, the Caribbean and the Pacific (ACP) countries in complying with European SPS and traceability requirements, the EU launched in 2001, at the request of the ACP Group of States, the so-called Pesticides Initiative Programme, managed by the sector's interprofessional association COLEACP. The PIP's actions include creating awareness and providing information to ACP producers and exporters regarding EU regulations and requirements; assisting companies in setting up food safety and traceability systems; training stakeholders, from company executives and technical managers to small – scale farmers. Although the PIP is aimed at both public and private actors, the private sector constitutes the programme's preferred

partner. To date, the PIP has signed cooperation agreements with some 105 companies in 21 ACP countries. Through these agreements, the programme reaches nearly 75 000 small farmers who benefit from the support and training it provides. In a first phase, the PIP organized awareness raising workshops for general managers of ACP producing and exporting companies, to inform them about the importance of complying with European SPS and traceability requirements. A range of issues are dealt with, relating to food safety management, the safe use of pesticides, hygiene, traceability tools, pest recognition, crop protection and access to information. Then the focus of the programme shifts to the middle management, including production, traceability, quality, crop and packhouse managers, who deal with the day – to – day implementation and management of food safety and quality systems. This phase constitutes the core of the PIP training programme, as the middle management can transfer information and know – how to the lower ranks of the company, including farm and packhouse workers, small – scale producers etc, which are difficult to reach directly due to their diverse and scattered nature.

For more information regarding the PIP, see <<http://www.coleacp.org/pip>>.

## V. CONCLUSIONS

The unitary values of many traditional agricultural export crops have decreased steadily over the past decade, highlighting the risks involved for developing countries in depending upon a narrow product base for earning foreign exchange through exports. Conversely, unitary export values for tropical fruits and vegetables have held up fairly well over the past decade, suggesting that exports of these products may represent a valuable alternative to exports of traditional agricultural products for developing countries wishing to maintain or expand their agricultural export revenues. Trade analysts expect the upward trend in exports of tropical fruits and vegetables from developing countries, witnessed over the course of the past two decades, to continue in the medium term. Imports into the QUAD countries, which today represent over three fifths of worldwide imports of these products, are expected to continue to expand as consumers look for 'new' and 'exotic' foods.

Although the prospects for the further development of the QUAD markets for tropical fruits and vegetables look promising, many challenges lie ahead. As the demand for better food safety increases with growing consumer affluence and, in reaction to a number of highly publicized food safety crises, sanitary and phytosanitary standards, and especially food safety standards, in QUAD country markets are becoming increasingly stringent. Food safety authorities in QUAD countries are increasingly concerned about the impact upon human health of residues of active substances in and on foodstuffs, resulting in the development of ever more restrictive legislation in the field of plant protection products. As a result of stringent and costly registration and authorization procedures, the number of active substances authorized for use on foodstuffs consumed in the QUAD countries has decreased, while MRLs are increasingly set at lower levels, making it ever more difficult for developing country suppliers to comply with these standards.

In reaction to the food safety crises of the past 10 years, QUAD governments are shifting the responsibility for the safety of their nations' food supply from public food safety authorities to private food business operators, resulting in an increasing prominence of private quality and safety standards in international trade. There is an urgent need for scientific research into the consequences of this proliferation of private standards upon exports of foodstuffs from developing countries, as well as for the development of recommendations on how to deal with this evolution.

Although the WTO Agreement on Sanitary and Phytosanitary Measures provides an international framework to ensure that plant health and food safety requirements are not more trade restricting than strictly necessary to protect human and plant health, a growing body of literature highlights the difficulties of developing countries to participate in the mechanisms developed by the Agreement. As a result, developing countries not only fail to fully exploit the potential opportunities created by the Agreement, but also become alienated from mainstream debates, especially with regard to standard setting activities. Meanwhile, the number of SPS notifications submitted by QUAD countries - relating to fruits and vegetables in general and to tropical fruits and vegetables in particular - has increased consistently throughout the years, confirming the view that QUAD countries' activity in the field of food safety has intensified. Unfortunately, the bulk of the notifications submitted by QUAD countries are not harmonized, i.e. not based on internationally agreed standards.

The proliferation and increasing stringency of food safety and plant health requirements imposed by developed countries have led to growing concerns amongst many developing countries as to their administrative, technical and financial capacities to comply with these requirements and consequently uphold their access to export markets. While evidence suggests that the benefits of complying with SPS requirements seem to outweigh costs for developing countries as a group, these costs and benefits may be distributed unevenly between countries, and between operators within countries. At the international level, concerns are that lower income countries with limited financial, human and technical resources may be unable to comply with SPS requirements imposed by developed countries, and thus be marginalized in international trade. At the na-

tional level, smaller exporters and smallholder farmers may be unable to comply with increasingly stringent SPS requirements due to their limited financial resources, and thus be excluded from export supply chains. Evidence illustrates that public policy can be decisive in determining whether growers lose or gain from SPS compliance.

In certain circumstances, SPS requirements may function as a ‘catalyst’ for competitive repositioning and enhanced export performance of developing countries. The extent to which this ‘standards – as – catalysts’ perspective materializes crucially depends upon the capability of developing countries to adjust and modernize their supply chains to comply with new SPS requirements. This capability in turn depends upon the human and financial capacities of governments and administrations to perform regulatory, research and management (e.g. inspection) functions. Recent experiences have shown that it is of primordial importance for public authorities to engage in an open dialogue and cooperate with the private sector. Indeed, since they are well informed about technical capacities and constraints, private operators can make an important contribution towards the identification of deficiencies in the sector’s capacity to meet export markets’ SPS requirements and the development of appropriate actions to remedy these deficiencies.

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