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Forum

Improving Horticultural Export Performance of Developing Countries in Asia

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Many developing countries in Asia have a comparative advantage in the production of horticultural commodities with favourable growth prospects in world markets due to relatively high income and price elasticities. As a result, the horticultural sector has traditionally been an important source of foreign exchange earnings in Taiwan, China, the Philippines and (more recently) Thailand and Malaysia. On the other hand, the performance of potentially significant exporters in South Asia has been disappointing. Drawing from the widely diverging experiences of six countries, it is concluded that government policies significantly influence horticultural export performance. To meet strict consumers' specifications in importing countries, maximum cooperation is needed between the private export sector, the public sector and growers.

1. Introduction

Most horticultural products¹ in developing countries are produced on small farms and often in relatively labour-intensive ways. With appropriate policies and technologies, horticultural production can significantly contribute towards increasing the incomes of small-scale farmers, expanding employment opportunities and enhancing rural development. In addition, the horticultural sector can be an important source of foreign exchange earnings. In Asia, several countries including China, Taiwan, and the Philippines have traditionally been important exporters of horticultural commodities. More recently, Thailand and (to a lesser extent) Malaysia have greatly increased their exports of horticultural products (Figure 1). Although both Hong Kong and Singapore are also increasingly significant exporters of fruits and vegetables, most of their horticultural exports are merely re-exports of imported commodities.

Why have some countries been able to establish themselves as major horticultural exporters, while

other countries with similar growing environments have not? Which factors are important for developing a comparative advantage in the production and export of horticultural products? What determines major trade flows and access to export markets? To what extent does increased competition in the world markets for horticultural products and the resulting need for continuing decreases in unit production costs lead to the creation of negative production externalities? What is an appropriate role for the government in trying to reduce negative externalities and help in achieving increased horticultural production and exports in a sustainable way?

This paper addresses some of these questions. It differs from most previous studies of trade in horticultural products which have either been global (Islam 1990) or highly commodity and country-specific (von Braun *et al.* 1989).

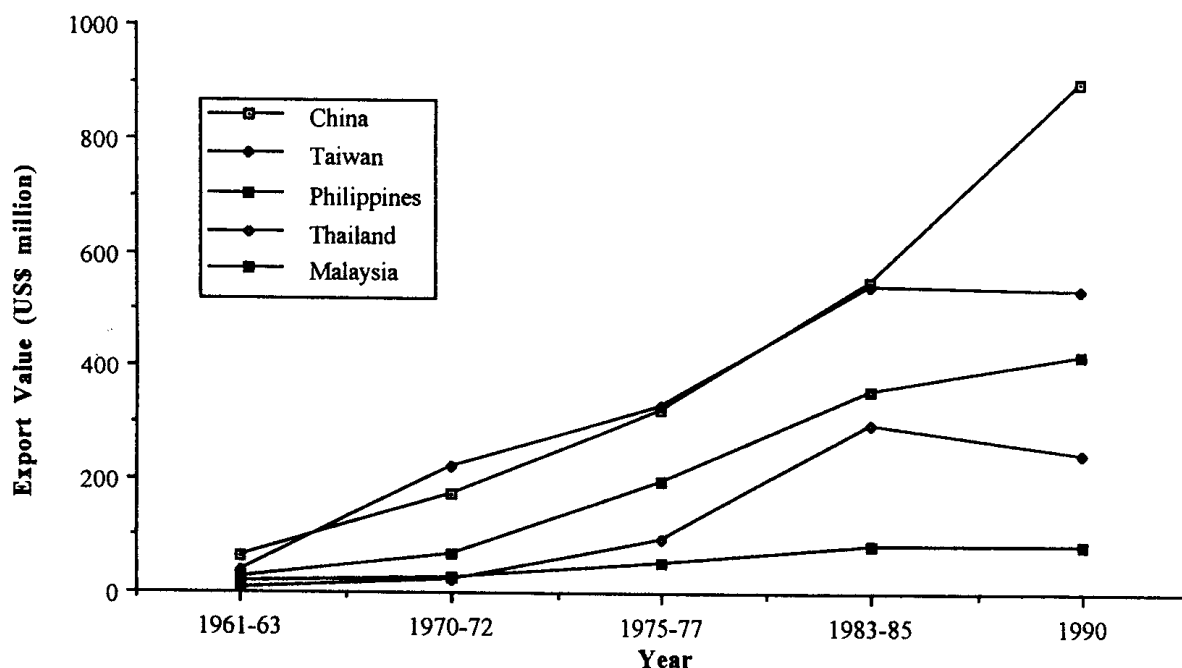
The paper summarizes past trends and current developments in trade flows of horticultural products produced in Asia, reviews export performance of

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¹ Horticultural products as defined in this paper include vegetables and fruits (both fresh and processed). Cut flowers are included only where explicitly stated.

Figure 1: Three-Year Average Export Value of Fruits and Vegetables in Selected Asian Countries



Source: Derived from Anon(1991), FAO(1989b), FAO(1990c), Islam (1990), ROC (1971,1980,1989,1990,1991), TDRI (1992)

various major as well as some minor exporters of horticultural products in Asia and identifies conditions necessary for success in the world market for horticultural products; and briefly reviews the market structure and demand in high-income importing countries of horticultural products, derives implications for horticultural exporters, and suggests implications for future export strategies and policies.

The paper consists of five sections. The second section, in addressing export strategies and past trends in horticultural exports, sketches the framework for the more detailed discussion regarding the performance of individual exporters of horticultural products in section three. The fourth section provides an overview of the likely trends in major export markets for horticultural products. The final section is reserved for conclusions and for a few comments regarding the relationship between profitability and sustainability in the production of horticultural commodities.

2. Export Strategies and Trends in Exports of Horticultural Products

Many developing countries place great emphasis on the promotion of manufactured exports in formulating their export strategies, arguing that agricultural exports face relatively slow growth prospects in world markets due to low income elasticities of demand. The price fluctuations of most traditional export items of developing countries are no longer subject to international commodity agreements. By 1989, the stabilization provisions of all but one of the international commodity agreements had collapsed, leaving natural rubber as the only commodity with an internationally agreed stabilization mechanism (FAO 1990a). In addition, food exports such as cereals, livestock products, and sugar can often not compete with subsidized exports of developed countries. Diversification of the agricultural production and export base has the potential for significantly increasing agricultural incomes and export revenues and low-

ering their variability which is particularly relevant for countries that do not compete well in world markets for nonagricultural goods (Arnade and Lee 1990, Athukorala 1991). Nontraditional agricultural exports (including horticultural products - the world market for which has expanded consistently throughout the past three decades²) have own-price and income elasticities of demand that considerably exceed those of other agricultural commodities (APO 1988). This is despite the fact that aggregate import demand for fruits as well as for vegetables has been shown to be own-price inelastic. For example, Islam (1990) found own-price elasticities of demand for fruit and vegetable exports of respectively -0.51 and -0.82, but elasticity values were as high as -5.35 for nontropical fruit juices and -2.72 for hops. The same author estimated aggregate income elasticities of demand for vegetable imports of 1.16, for fruit imports of 0.95, and for imports of processed fruits and vegetables of 1.70. These estimates considerably exceed income elasticities for beverages and tobacco, and agricultural raw materials, which have been estimated at 0.35 and 0.80, respectively (Askari and Cummings 1976).

Both own-price and income elasticities in the importing country typically depend on the source of supply of the exported commodity. Therefore, estimates of trade flow-specific, own-price and income elasticities provide extremely useful information to exporting countries about how their specific product is perceived by consumers in importing countries to be different from those of other exporters. This can help in developing strategies regarding what to export and where to export. Even if import demand for a commodity as a whole is income-elastic, the demand for a specific type or variety can be income-inelastic due to a low sensitivity to total import expenditure on that commodity. For example, Honma (1991) estimated the income elasticity of aggregate demand for canned bamboo shoots in Japan at around 2.5. However, while demand for canned bamboo shoots from Thailand is highly income-elastic (7.8), the income elasticity of demand for canned bamboo shoots from Taiwan at -0.1 is nearly perfectly income-inelastic.

To achieve further increases in foreign exchange earnings from the export of horticultural products, developing countries should aim at (1) capturing an increasing share of world trade by becoming more competitive in the production of own-price elastic commodities, i.e., achieving reductions in their unit production costs, (2) diversification, i.e., redirecting the composition of their exports towards commodities that are not only own-price elastic but income-elastic as well, and (3) increasing the share of processed products whose unit value and income elasticities are typically some two to three times that of fresh products. Processing adds to the value of the products and generates greater business activity (particularly where there is no labour scarcity), thus increasing both private and public incomes as well as employment (Schluter and Edmondson 1989). In addition, together with preservation and exports, processing represents an alternative way to increase prices by stimulating demand during peak seasons when excess supply causes large price decreases needed to clear markets. The share of processed products in developing country horticultural exports increased from 33 per cent in 1961-63 to 52 per cent in 1983-85. The latter figure for vegetables alone is 19 per cent; however, it is over 36 per cent for the Asian countries (21 per cent if Taiwan is excluded) and as high as 89 per cent for Taiwan (Islam 1990). For fruits, this trend may well continue because the processing of imported fruits in developed countries is expensive in view of their relatively high transportation costs, the risk of loss of freshness or deterioration in quality during transport, and high labour costs. Moreover, the demand for processed fruits in developed countries can be expected to continue rising in view of high income elasticities. However, the relative share of processed vegetables in Asian horticultural exports is declining. This trend is especially clear in Taiwan where a greater emphasis has been put on the export of fresh vegetables to Japan. Taiwan has largely lost its comparative advantage in processed vegetable pro-

² The value of world trade in horticultural products increased from less than US\$4 billion in the early 1960s to some US\$30 billion in 1990 (Islam 1990, Industry Commission 1992).

ducts such as canned asparagus, mushrooms and bamboo shoots, mainly due to rapidly increasing labour costs.

Besides the above demand-related factors, it has been argued that superior export performance comes mostly from active supply-side policies. Domestic supply conditions influence export performance through the country's ability to maintain its competitiveness in traditional products and to diversify into new lines (Athukorala 1991, Burfisher *et al.* 1991). In addition, an efficient marketing infrastructure in the exporting country and close links with effective distribution systems in the importing countries are generally considered of critical importance to growth in exports of horticultural products. All of these factors can be significantly influenced by government policies. The critical role of reliable transportation systems can be illustrated by the fact that transportation costs alone can account for up to 60 per cent of a product's retail price (Industry Commission 1992). Close distribution links are of paramount importance in obtaining precise information on the importing country's requirements regarding quality, packaging and promotion, as well as for the ability to take advantage of market niches at any one time. Besides price competition, non-price competition is important. For example, sales promotions by exporters have significantly increased Japan's imports of cut flowers from the Netherlands and bananas from the Philippines at the expense of Taiwan which lost market share in both commodities. Figures supplied by the Taiwan Flower Exporters Association show that Taiwan's earnings from flower exports have decreased in absolute terms as well, from US\$16.8 million in 1988 to 10.6 million in 1990.

3. Performance of Major Asian Exporters of Horticultural Products

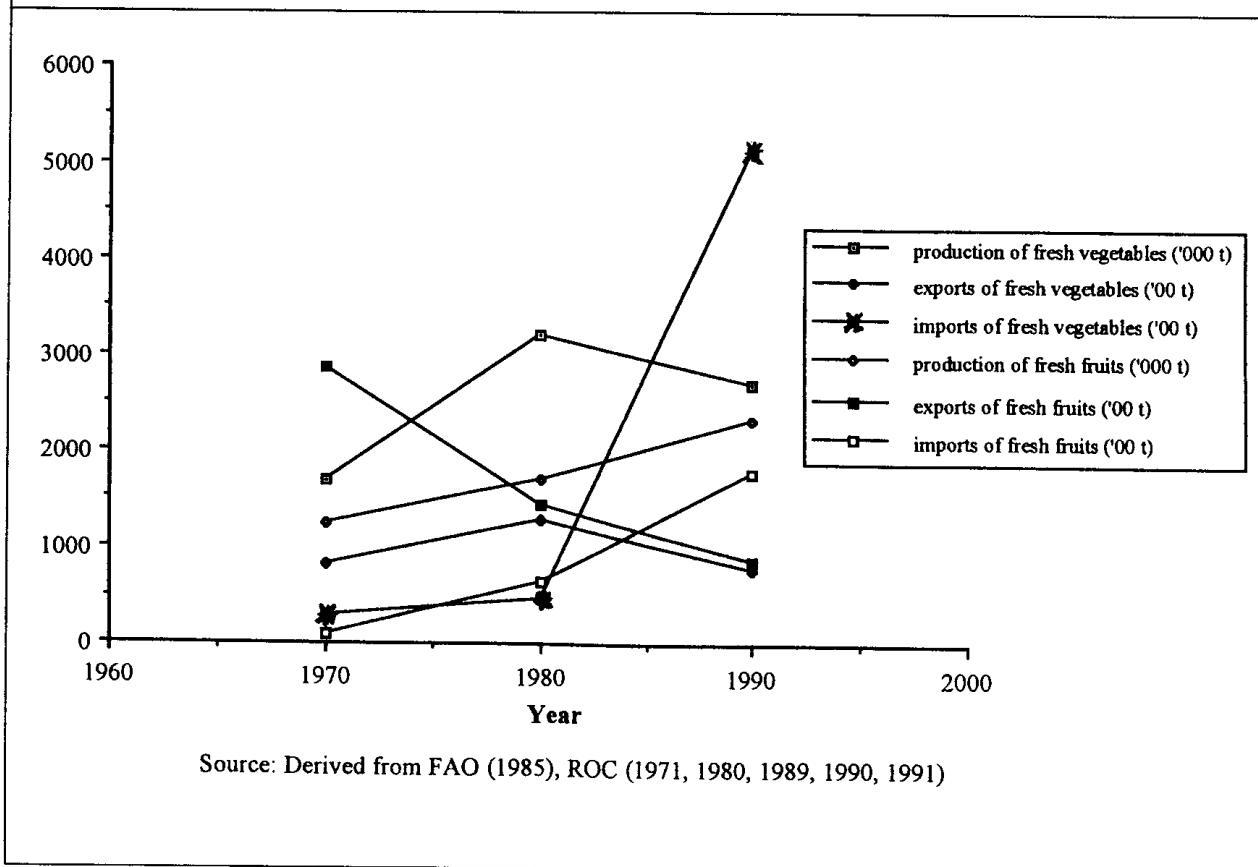
3.1 Taiwan, a traditional exporter of horticultural products

Taiwan has experienced significant decreases in both area and production of vegetables during the 1980s, with production falling from 3.5 million metric tons (mt) in 1984 to 2.7 mt in 1990 (ROC

1971, 1991). On the other hand, area and production of fruits have increased from 115,500 ha and 1.7 mt in 1981 to 190,800 ha and 2.3 mt in 1990. Overall, Taiwan has been moving from being a major exporter of horticultural products towards becoming an increasingly significant importer of such products (Figure 2). Continuing strong economic growth in both the manufacturing and services sector, combined with rapidly increasing prices for labour and land, are quickly eroding Taiwan's comparative advantage in the production of agricultural commodities. The current development stage which Taiwan is experiencing is in many ways similar to that of Japan during the period from the 1950s to the 1970s, when the growth rate of labour productivity in the manufacturing sector greatly exceeded that of the agricultural sector. Over 80 per cent of Taiwan's exports of horticultural products (valued at US\$545 million in 1990) are now processed products (Table 1). Export volumes during 1990 of both fresh fruits (78,000 t) and vegetables (87,000 t) were about one-half their respective 1985 levels (ROC 1991). Exports of processed vegetables have decreased by some 50 per cent as well since the mid 1980s. In line with this trend, import quantities of fresh vegetables during 1990 (516,000 t) were about double their 1988 levels, causing Taiwan to overtake Singapore as Asia's third largest import market for horticultural products, after Japan and Hong Kong. Both quantity and value of Taiwanese imports of horticultural products are rapidly approaching Hong Kong levels and can be expected to feature continuing strong growth. The rise in imports of fresh fruits, although impressive, is less dramatic than that of fresh vegetables mainly because of trade barriers on fresh fruits (Evans 1990).

3.2 Thailand, a nontraditional exporter of horticultural products

Rice and fibre crops have traditionally been the main staple crops in Thailand's agriculture. The focus has, however, shifted towards the production of oilseed, horticultural and other perennial tree crops, mainly because their potential marginal return per unit area is higher than that of rice and fibre crops. The diversification away from rice has been actively stimulated by the government which real-

Figure 2: Production, Exports and Imports of Fresh Fruits and Vegetables in Taiwan

ized that, given Thailand's degree of monopoly power in the world market, there is a limit on the amount of rice it can sell without having an adverse impact on its terms of trade (Siamwalla *et al.* 1990). Also, since the removal of all taxes on rice exports in 1986, farmers are no longer insulated from world rice price instability and consequently have a much greater incentive to diversify their cropping patterns. Today, Thailand produces between 5 and 6 mt of fruits and about 2.5 mt of vegetables every year (FAO 1990b) and has greatly increased its role as a major exporter of horticultural products during the past decade. Even though rice remains the largest agricultural export item, its contribution towards foreign exchange earnings has become smaller as a result of the decline of rice prices during the 1980s. The opposite situation holds for horticultural products. Total 1990 revenues from exports of fresh, dried and canned vegetables were nearly US\$170 million, a five fold increase since 1985 (Figure 3). Fruit exports during 1990 totalled 570,000 t, valued at US\$444 million, up from less

than US\$80 million in 1980 (unpublished data provided by the Ministry of Agriculture and Cooperatives, Bangkok, Thailand; and TDRI 1992).

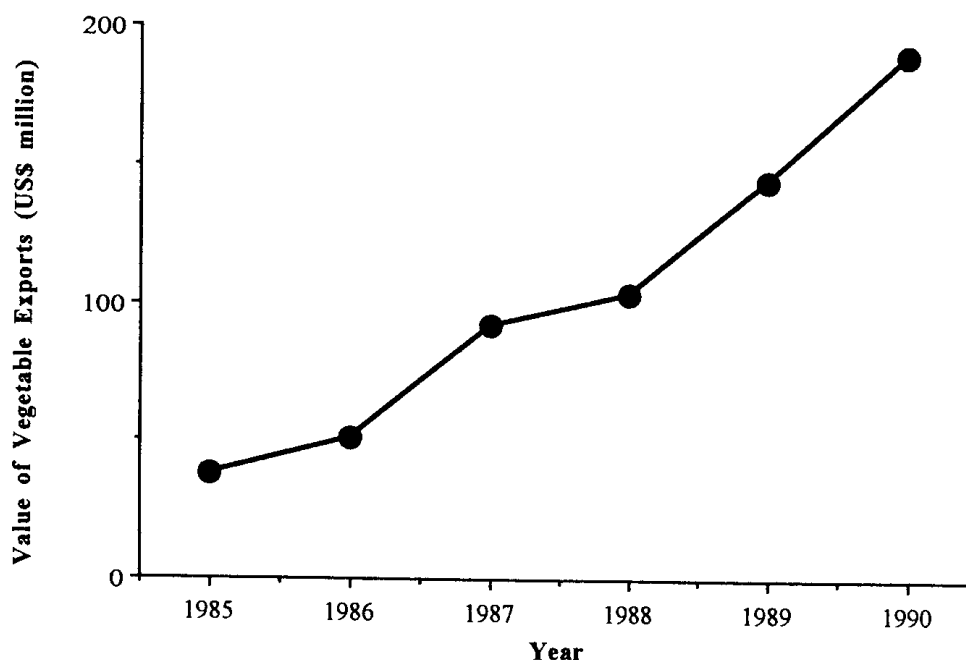
Thailand has benefited significantly from rapidly increasing wages and land prices in Taiwan, its principal competitor in the world market for horticultural products and in the Japanese export market in particular. For example, it has been estimated that increases in labour costs in the production of cut flowers and canned bamboo shoots in Taiwan are responsible for over 90 per cent of the increase in the export prices of these commodities to Japan (Honma 1991). Other examples where Thailand has taken over part of Taiwan's original exports to Japan include frozen and canned pineapples and ginger. Besides the labour cost advantage, technological improvements in the production of, for example, cut flowers, ginger, and green beans have made significant contributions to improving Thailand's competitive position in these commodities in the Japanese market.

Table 1: Production, Exports and Imports of Horticultural Products in Taiwan, 1970, 1980 and 1990

Year	1970		1980		1990	
	Quant. (t)	Value (US\$'000)	Quant. (t)	Value (US\$'000)	Quant. (t)	Value (US\$'000)
Item						
Vegetables, fresh						
Production	1,685,191	108,919	3,224,849	NA	2,713,277	895,134
Exports ^a	81,734	8,846	128,193	36,595	78,026 ^a	36,697
Imports ^b	29,561	3,978	47,248	22,635	516,426	139,116
Fruits, fresh						
Production	1,245,860	89,687	1,716,803 ^c	NA	2,326,741	1,373,152
Exports	287,110	41,097	143,539	43,414	87,104 ^d	62,997
Imports	9,027	3,054	64,874	60,408	178,192 ^e	177,288 ^e
Vegetables, processed						
Exports	186,919	85,722	421,993	441,093	211,683	354,418
Imports	NA	NA	NA	NA	NA	NA
Fruits, processed						
Exports	112,405	30,079	190,974	151,376	43,131	80,526
Imports	NA	NA	6,169	8,206	40,880 ^e	46,088 ^e
Flowers and Plants						
Production ^f	NA	NA	20,810	NA	65,796	137,873
Exports	NA	NA	NA	NA	4,204	10,509
Imports	NA	NA	NA	NA	3,188	8,501
NA = data not available.						
^a Represents a steady decline from a level of 152,570 t in 1985.						
^b It should be noted that imports of fresh vegetables into Taiwan show very large inter-year fluctuations. For example, imports (in t) during 1985, 1987, 1988, and 1989 were 338,784, 98,990, 249,589, and 478,022, respectively.						
^c Data refer to 1981 rather than 1980.						
^d Represents a dramatic decline from 143,612 t in 1989.						
^e Data refer to 1989 rather than 1990.						
^f Quantity unit is 1,000 dozen rather than t.						
Source: ROC (1971, 1980, 1990). Taiwan's Flower Exporters Association, Taipei (unpublished data).						

Research, development and training activities carried out by national research institutes and universities, in conjunction with international institutes such as the Asian Vegetable Research and Development Center (AVRDC) and the Food and Agriculture Organization of the United Nations (FAO) (FAO 1989a,c), have contributed to continuing increases in production for domestic consumption and exports, despite slight decreases in the area

cultivated with vegetables. A good example of the potential impact of research on export performance is a project titled "Improving Quality of Fruits and Vegetables for Export", carried out by the Department of Agriculture and Extension (DOAE) and supported by the United States Agency for International Development. Project activities focus on developing appropriate agronomic and cultivation practices for horticultural export crops, including

Figure 3: Thailand: Trend in Exports of Fresh, Dried and Canned Vegetables

Source: Derived from import and export statistics, Department of Customs.

postharvest operations. The Bank for Agriculture and Agricultural Cooperatives assists the project with credit in view of the high capital intensity of horticultural production. Transfer and extension of the research results to mostly small farmers is initiated by the researchers themselves. This approach represents an interesting way to overcome the usual dichotomy between research and extension. Another interesting feature of the project is the close links of its researchers with the private sector. The decision on the crop to which research resources are to be devoted is made in close collaboration with private export traders; the latter identify the crop-specific production management constraints to the export of horticultural products and convey these to the researchers. Private exporters receive assistance from project personnel in identifying farmers whose produce meets their export quality requirements.

Thailand's success in the export of horticultural products constitutes a prime example of the impor-

tant role of a conducive overall economic environment in determining export performance. Thailand has been able to avoid the adverse effects on export growth of the state marketing board system. It has also avoided excessive taxation of exports and exchange rate overvaluation, thus maintaining a relatively free trade policy for agricultural exports and imported inputs. Active supply-side policies by the government, including continuous improvement in marketing and transportation facilities as well as training, have stimulated horticultural exports as well. For example, the Thai government has set up packing, storage, and sanitary facilities for rent to traders in major producing areas such as Chantaburi province which is responsible for 60-70 per cent of total horticultural export production. Whereas DOAE is responsible for the production side as well as for post-harvest operations, the Export Promotion Department of the Ministry of Commerce (MOC), in collaboration with a select group of exporters, is responsible for the overseas promotion of horticultural products. The main fo-

cus of the Export Promotion Department's activities is to increase overseas consumers' awareness of Thai products through cooperation with the private sector in promoting horticultural exports. This is done by sending trade missions abroad to expand or seek new outlets, arranging trade fairs and conducting advertising campaigns. In addition, Thai embassies abroad have assisted in export promotion activities organized by the Thai Fruits and Vegetables Export Association. This is a private organization which consists of about 50 export companies, representing about one-third of the total number of exporters of horticultural products in Thailand. From personal communications, officials at both DOAE and MOC pointed to the strong links between the two ministries. Annual meetings between DOAE, MOC, representatives from the private sector, and selected farmers greatly increase farmers' understanding of the export markets' requirements.

As a result of these efforts, overseas consumers have become increasingly familiar with horticultural products from Thailand. Combined with health considerations prompting consumers worldwide to increase vegetables and fruits in their diet, and the rising number of Asian immigrants who settle in Europe and North America, this has led to substantial increases in the demand for vegetable and fruit products from Thailand. Thailand's experience in horticultural export marketing indicates that a good reputation can only be built over time and requires substantial public relations efforts.

Thailand has diversified its vegetable exports to include a range of commodities. Fresh vegetables exported consist mainly of asparagus, onions and shallots, young corn, and capsicum and pimento fruits. Thailand's exports of frozen vegetables consist mainly of vegetable mixtures and beans. Although most growers of horticultural products in Thailand are traditionally small-scale, often part-time farmers, the majority of whom produce primarily for the domestic market, the practice of contract-growing for large exporters and processing factories is on the rise as horticultural production is becoming increasingly vertically integrated. Contract farming is more common in fruits than in vegetables where it is mostly confined to tomato, mainly for processing into paste.

Thailand's export of horticultural products is heavily oriented towards Japan and to its traditional export markets in Malaysia, Hong Kong, and Singapore. For example, 65 per cent of total export value of fresh vegetables goes to Japan. Thailand's increasing export concentration on Japan since the mid 1980s has been highly successful; its horticultural export commodities have captured a disproportionately large share of the growth in Japan's import demand (Honma 1991). While Japan's imports consist mainly of vegetables and flowers, Hong Kong imports mainly fruit products from Thailand. This reflects Japan's very strict import restrictions on fresh fruits³; as a consequence, Japan's fruit imports from Thailand consist mostly of frozen items. Other export markets that are rising in importance include Europe and North America.

To further increase the exports of fruits and vegetables, improvements in postharvest techniques and increased private sector investments in processing plants for canning, freezing, and dehydrating are needed. These should be of relatively small size to increase capacity utilization and capable of handling various kinds of fruits to achieve greater flexibility in the processing of surplus production for which there is no fresh market.

3.3 Some other Asian exporters of horticultural products

China⁴

After India with an annual production of about 25 mt, China is Asia's second largest producer of fruits with a production of 17 mt during 1989. Total fruit production has more than doubled since 1980, and some individual fruits have shown even more dramatic increases. For example, production of oranges has increased nearly fivefold over the past decade, from 0.8 mt in 1980 to 3.7 mt in 1989, nearly double India's production. China is now

³ For example, in the case of mango, only one variety (the thick-skinned Nang Klangwan variety) is accepted and only when the produce has undergone vapour heat treatment.

⁴ This section draws heavily on FAO (1989b,d).

Asia's largest producer of citrus fruits, apples, pears, and grapes, and the third largest producer of bananas. China is also a very significant producer of vegetables. Adjusting the available FAO production statistics for their Taiwan component reveals that production of fresh vegetables in China has increased from around 78 mt in 1980 to 111 mt in 1989.

China's exports of fruits and vegetables have shown dramatic increases over the past three decades; earnings (annual averages for each period in million US\$) rose from 64 in 1961-63, 172 in 1970-72, 323 in 1975-77, to 552 in 1983-85 (Islam 1990). In 1987, China exported about 400,000 t of fruits valued at US\$270 million, and 865,000 t of vegetables worth about US\$565 million. Hong Kong is China's main export market for horticultural products. Despite increasing competition from reliable suppliers of high-quality vegetables such as Taiwan, Thailand, Australia, and South Korea, China is still Hong Kong's most important source of fresh and dried vegetables, and a significant source of fruits as well. Other important export markets for Chinese horticultural export products include (until very recently) the former Soviet Union and Japan. More recently, Taiwan is also becoming an increasingly important importer of horticultural products from China, particularly dried mushrooms.

With the exception of trade with Hong Kong which is the responsibility of the Guangdong Provincial Government, trade in fruits and vegetables in China is monopolized by two state corporations. The China Grains and Oils Export and Import Corporation handles exports and imports of fresh and preserved fruits and vegetables. The China Native and Livestock Products Export and Import Corporation is responsible for the trade in dried fruits and vegetables. These corporations completely control all export marketing activities. They allocate quota to prospective agents in the producing areas where the produce is collected by a network of state procurement agencies; they are the only source of market information; indeed, they are the only link between domestic producers and foreign consumers. Even though the situation may be changing in the recent past in line with the general trend of increasing economic reforms, the still rather strict functional

division between domestic and foreign trading is likely to discourage the full utilization of China's export potential.

The Philippines

The Philippines have a strong comparative advantage in tropical fruit production, mainly due to favourable climatic conditions and relatively cheap labour. Consequently, exports of fresh fruits and vegetables consist of 98 per cent of tropical fruits among which banana, pineapple and mangoes loom largest. Banana is the most important horticultural export item of the Philippines, followed by pineapple. Exports of bananas and pineapples during 1989 came to 850,000 t (US\$146 million) and 152,000 t (US\$24 million) respectively (FAO 1990c).

The banana production structure is dichotomous in that it includes both small farmers (5 ha or less) and large plantations, accounting for 83 and 17 per cent of production respectively (Quisumbing 1988). Although average banana yields in the Philippines stand at around 12 t/ha (compared to over 20 t/ha in Taiwan), plantation yields at 30-40 t/ha are four times small farmers' yields. Banana production from large plantations is mostly for export, with Japan as the main customer. However, the Japanese market can be considered as largely saturated, as evidenced by a declining trend in banana imports during the past few years. Varieties other than the common 'Cavendish' variety have been test-marketed in Japan but without significant successes thus far. Research on the characterization of the postharvest behaviour of nontraditional varieties is necessary to boost the declining export market. Continuing maintenance research on banana pests and diseases, including the monitoring of their economic importance, is also important given the demand for high-quality and blemish-free bananas in importing countries. Few multinational companies invest in research, and very little research is carried out on small-scale banana growing. Postharvest technologies and transport facilities are inadequate, suggesting the need for government assistance. The Philippine government could also assist in the exploration of new export markets as has occurred in Thailand.

The majority of pineapple in the Philippines is grown on plantation-type farms. Although FAO statistics regarding pineapple production in the Philippines are subject to substantial revisions from year to year, the latest figures suggest an annual production of around 1.2 mt throughout the late 1980s (FAO 1990b). Exports of fresh pineapples have decreased somewhat recently, from 167,000 t in 1987 to 152,000 t in 1989. Export revenues, which have fluctuated around US\$24 million per year, have decreased less than volume due to price increases during the second half of the 1980s. Exports of canned pineapple have been fairly stable at around 180,000 t per year, resulting in annual revenues oscillating around US\$85 million. Pineapple juice exports bring in another US\$35 million annually.

Unlike pineapples and bananas, mangoes for domestic consumption and exports are mostly produced by individual farmers on a relatively small scale. The area under mangoes has increased from 40,000 ha in 1980 to over 50,000 ha in the late 1980s, for a production of around 370,000 t (ASEAN ADPC 1989). Mango yields in the Philippines have shown a sharply declining trend, from between 9 and 10 t/ha in the late 1970s and early 1980s to less than 6 t/ha in the second half of the 1980s, possibly due to changes in the age distribution of trees. Also, many mango producers lack adequate information regarding mango cultivation practices, relative profitability vis-a-vis other crops, appropriate postharvest practices, etc. For example, most farmers do not apply fertilizer, which contributes to the generally low yield and poor quality of the fruits (Quisumbing 1988). Thus, improvements in extension services for mango farmers are necessary.

Mango has substantial potential for increased export earnings because of its potentially high returns, the existence of many latent export markets (including Europe and the United States (US)) and the introduction of chemical flower induction, enabling year-round mango production. In the Japanese market, mangoes imported from the Philippines are considerably cheaper than mangoes from Thailand or Mexico, mainly because of much lower transportation costs. However, the export performance of mangoes has not lived up to expect-

tations, despite the absence of tariff and non-tariff barriers in most export markets. Nevertheless, export earnings from fresh mangoes have roughly doubled from US\$8 million in the mid 1980s to US\$16 million in 1988. Despite the fact that the Philippine mango variety (called Manila Super Mango or 'Carabao') is preferred among consumers, prices received in major export markets such as Japan, Hong Kong, and Singapore are low because of the relatively low quality of the Philippine mango. Improvements in postharvest technologies at both the farm level and in further distribution are needed for Philippine mangoes to achieve a higher price. Also, the government could supply both farmers and export traders with credit for appropriate packaging as well as for promotion. Government investments in rural infrastructure, particularly in roads, would improve distribution and marketing efficiency and reduce post-harvest losses. Research might contribute to improved export performance by further development of mango varieties with a longer shelf life and suitable for off-season cultivation to achieve a year round supply. To ensure that the fruits arrive in good shape at their destination, development of techniques which delay the ripening process is also needed. All these measures seem fairly urgent in view of the increasing competition faced by the Philippines from other countries, including Australia and Malaysia, both of which have started planting the 'Carabao' mango variety as well.

Malaysia⁵

Fruits in Malaysia are mostly grown on about 135,000 smallholdings of between one and two ha in size. The area under fruits has grown from 70,000 ha in 1970 to nearly 200,000 ha in 1990. In contrast, the area under vegetables is minor and has oscillated at around 10,000 ha throughout the past decade, producing about 470,000 t per year (Anang 1989). Even though a sizable proportion of Malaysia's total vegetable production is exported (mostly to Singapore), at about US\$20 million per year vegetable exports are rather minor in absolute

⁵ This section is largely based on Anon (1991) and Khairul *et al.* (1989).

terms and Malaysia is a substantial net vegetable importer.

Durian, banana, rambutan and pineapple account for most of the area under fruits. Although Malaysia's export revenues of fruit products have seen a dramatic increase from US\$6 to US\$42 million between 1980 and 1989, they are small compared to those of palm oil and rubber exports which exceed US\$1 billion each. The exports of fresh pineapple (mostly to Singapore) are small at only US\$1 million per year; however, annual exports of canned pineapple are significant at about US\$22 million. Malaysia's share of the world market for canned pineapple is, however, only about 4 per cent, the largest exporters being Thailand (30 per cent of the world market) and the Philippines (23 per cent of the world market). Durian, starfruit, papaya, watermelon, and banana accounted for most of 1989 export revenues from fresh fruits. With the notable exceptions of starfruit and papaya, over 70 per cent of fresh fruit exports goes to Singapore. Shortage of air cargo space is considered one of the most serious constraints to penetrating more distant fresh fruit export markets, Europe in particular.

In addition to fruit exports, exports of temperate cut flowers have significantly increased over the past decade, from less than US\$1.5 to nearly US\$10 million. While most flower exports go to Hong Kong, Singapore, Australia, Japan, and the Middle East, exports of cut flowers from Malaysia to Western Europe have declined drastically since 1983, mainly due to increased competition from Thailand, Singapore, Sri Lanka, and West Africa.

Pakistan

Although currently not an important exporter of horticultural products, Pakistan represents a good example of a country that has a large but as yet unused potential for fruit and vegetable exports. Mangoes, onions, melons, and kinnow are considered as the crops with the largest immediate potential for export increases (PSL 1989).

Production of both fruits and vegetables has increased substantially over the past decade, mainly

due to area expansion. In 1980, vegetable production (in mt) stood at 2.1, whereas the corresponding figure for fruits was 2.6. By 1989, these figures had increased to 3.5 and 3.8, respectively (PSL 1989). In the same year, Pakistan's exports of fruits amounted only to 64,000 t (US\$13.7 million) and that of vegetables to 35,500 t (US\$5.1 million). Exports of fruits in particular exhibit a declining trend. Processing of vegetables and fruits is negligible.

Pakistan's lack of a satisfactory export performance in horticultural products is not only a matter of inadequate postharvest handling and subsequent quality, but has its roots in the lack of a suitable production base. Even though Pakistani produce may score high on taste and flavour, other traits which are considered at least as important in world markets such as appearance, presentation and shelf life, are of low standard. However, considerable opportunities might exist to increase Pakistani exports if a new generation of progressive and professional export companies that are able to organize both production and marketing can be developed which can work under a conducive commercial and technical environment. A deliberate "growth for export" policy as well as increased investments in research and development would be elements of such an environment. Also, improvements in post-harvest methods, including adequate transport facilities, are needed. The experience of other Asian countries (including foremost Taiwan and Thailand, but also the Philippines and Malaysia) points to the inappropriateness of Pakistan's current export philosophy. Production decisions are made on the basis of supplying the domestic market, with any surplus being exported only in an opportunistic manner. Pakistan is, therefore, regarded as an unreliable exporter⁶. Explicit production for export is required to be successful. Also, evidence from other Asian countries points to the usefulness of organizing farmers into groups and educating them about the requirements of the export market. The private sector is currently not well organized and there is a lack of good information and market intelligence.

⁶ Interestingly, the Australian horticultural sector is perceived to face similar problems. See Industry Commission (1992).

Bangladesh

Bangladesh's exports of vegetables and fruits during 1989-90 amounted to only US\$7.5 and US\$0.7 million, respectively. Vegetable exports average only 5,000 t per year and consist mainly of indigenous types such as tital gourd, bitter melon, cucurbits, okra, and Indian spinach, largely for consumption in South Asian communities overseas. Mangoes are responsible for a large portion of fruit exports. Both vegetables and fruit exports are nearly exclusively destined for the United Kingdom (UK) and the Middle East, each accounting for about one-half of total exports. However, no well-organized export industry exists, as is reflected in the erratic earnings from fruit and vegetable exports. Unpublished data supplied by the Bangladesh Export Promotion Bureau indicate that vegetable exports made a quantum jump in 1985-86 to about US\$15 million, a fourfold increase over the previous year. During the subsequent year (1986-87) vegetable exports rose by another 30 per cent. After that, however, a decline has set in. Similarly, fruit exports tend to fluctuate wildly. Thus, as in the case of Pakistan, there is a clear role for the government to assist in storage, transportation, credit, and domestic as well as international marketing, including the provision of information to exporters as well as to overseas consumers. However, there seems to be a lack of appreciation in government circles that, for production programs to be successful, there is a need for an agricultural marketing body that provides advisory, facilitating, and regulatory services without being engaged in actual trading operations (Maziruddin 1990). A vegetable or fruit processing industry does not yet exist in Bangladesh.

4. Major Markets for Developing Country Exporters of Horticultural Products

The developed countries provide the largest market for horticultural exports, accounting for some 80 per cent of world imports of horticultural products. However, aggregate demand in developed countries is unlikely to grow rapidly given slow population growth and already high levels of per capita consumption. On the other hand, countries in east-

ern Europe could develop into high-growth markets for tropical horticultural products once incomes start rising. Also, per capita consumption of both vegetables and fruits differs widely among individual countries. Therefore, different countries have different potential for increased consumption and imports. For example, although per capita annual consumption of fresh vegetables for all Organisation for Economic Cooperation and Development (OECD) countries averages 85 kg, it varies from less than 40 kg in Sweden and Finland to nearly 110 kg in Japan and over 150 kg in Italy and Turkey. Similarly, the OECD average per capita annual consumption of fresh fruits is 75 kg, ranging from less than 40 kg in Japan and just under 50 kg in the UK, to nearly 150 kg in Spain and the Netherlands (Buckley 1990). Thus, exporters of horticultural products might consider concentrating their production and marketing efforts on exports to countries with below-average per capita consumption.

Although the European Community (EC) countries constitute the most important export market for Asian horticultural products, the fastest growing export markets are the US and Japan. Despite the fact that the expected expansion in aggregate demand for vegetables is considerably slower than for fruits (i.e., the income effect on consumption spending, or the marginal propensity to consume, is much larger for fruits than for vegetables), import demand in developed countries will continue to grow and will be the most important source of future expansion of horticultural exports from developing countries (Islam 1990).

Besides the EC, Japan and the US, the major export markets for Asian horticultural products are Hong Kong and Singapore both of which allow virtually free entry of horticultural products. Also, South Korea has the potential of becoming an important market for horticultural products if the current government policies of trade liberalizations continue⁷.

⁷ South Korea used to limit its imports of horticultural products by imposing strict quarantine and commercial laws. Although the latter have now been (or are in the process of being) abandoned, for the time being the quarantine laws continue to be enforced. In line with gradually opening its market for horticultural products, the government's budget for horticultural research for the 1992 fiscal year is three times that for 1991.

Per capita availability of fruit and vegetables in South Korea rose from respectively 102 kg and 18 kg during the period 1969-71 to 175 kg and 49 kg during 1984-86 (FAO 1991). However, as recently as 1984, South Korea's imports of fruits were only 20,000 t and that of vegetables 23,000 t. Even though imports have started to rise during the last few years, import barriers remain high in terms of tariffs (commonly 30 and 50 per cent for vegetables and fruits, respectively) and non-tariff measures, including outright bans and strict quarantine rules.

Japan is the largest market for horticultural products in Asia. In 1988, more than 3.3 mt were imported into the country at a value of US\$3.6 billion, up from US\$1.4 billion in 1980. In the 1980s, the value of horticultural imports grew at an annual rate of 12.5 per cent, or 2.5 times that of total agricultural imports (Honma 1991). At present, nearly 25 per cent of Japan's fruit consumption and 7 per cent of vegetable consumption are imported. Overall, Japan's dependence on imports for its supply of horticultural products is high; in 1988, imports accounted for 11.6 per cent of total supply in value terms. Over one-half the value of Japan's horticultural imports comes from Asian countries. Developing countries as a group have, however, captured a smaller share of the growth in the Japanese import market of horticultural products than developed countries, particularly in processed vegetables. However, developing countries were well able to cope with competition from other exporters of fruit to Japan.

Border measures such as tariffs and non-tariff barriers (including strict phytosanitary regulations) are a concern for all exporters of horticultural products to Japan. However, phytosanitary regulations in particular may disproportionately affect developing country horticultural exporters in view of their often relatively lower standards of postharvest handling methods and their lesser ability to address phytosanitary regulations by, for example, stationing Japanese quarantine officers in the port of shipment (like the Netherlands has done for cut flowers). On the other hand, figures supplied by Honma (1991, p. 63) show that Japan's tariff structure (commonly 5 and 10 per cent for vegetables and fruits, respectively) does not necessarily hurt

horticultural imports from developing countries more than those from developed countries. For example, a reduction of all tariff rates on horticultural imports to zero per cent will particularly benefit kiwi exports from New Zealand, banana exports from Taiwan (rather than those from the Philippines) and avocado exports from the US (rather than those from Mexico). On the other hand, in the case of frozen pineapple and canned bamboo shoots, such a reduction will benefit Thailand and China rather than Taiwan.

It has been argued that the EC policies against horticultural imports are even more restrictive than those of Japan (Honma 1991). In addition to the Common Agricultural Policy (CAP) provisions which includes import tariffs of up to 50 and 26 per cent on imports of fruits and vegetables, non-tariff import measures, export subsidies and production subsidies to domestic horticultural producers, a number of horticultural commodities imported from third countries are subject to a reference price system which acts as a minimum import price system. While the Lome countries (a group of African, Caribbean, and Pacific Island countries) have established accords to receive preferential duty rates on their agricultural exports including those of horticultural commodities, Asian horticultural exporters as well as developed country exporters such as the US, Australia, and New Zealand do not enjoy similar agreements (FAO 1985, Industry Commission 1992). In general, however, where import tariffs on fresh tropical produce are levied, they are relatively moderate in most non-EC countries in Europe as well as in the US, particularly where they are off-season commodities. This is not, however, the case for most processed horticultural products for which there is considerable tariff escalation vis-a-vis fresh produce, and there are more non-tariff obstacles as well to afford protection to domestic processing industries (FAO 1989e). In Australia, most fresh vegetables and fruits are now free of duty, while most processed horticultural products are dutiable at 10 per cent and never at more than 20 per cent. Tariffs on nearly all fresh and processed horticultural products are being phased down to 5 per cent by July 1996 (Industry Commission 1992).

5. Concluding Remarks

Because horticultural products are generally labour-intensive, many developing countries with labour-abundant economies have a comparative advantage in the production of fruits and vegetables. At the same time, export prospects for developing countries are more favourable in some commodities than in others. For example, their comparative advantage is likely to be most significant in the production of tropical fruits and vegetables, rather than in off-season fruits and vegetables which do not require strictly tropical growing conditions. Regarding the latter, developing countries face stiff competition from specialized producers in a number of developed countries who are also often protected by tariff and non-tariff import barriers.

Depending on comparative advantages, developing countries may wish to expand processing capabilities to increase value added and spread exports over longer periods. For example, Islam (1990) found that an important reason for Thailand's substantially higher growth rate in earnings from horticultural exports compared to the Philippines during the period 1975-85 (16.6 as against 8.5 per cent per year) is the much larger share of processed products in Thailand's exports as compared to that of the Philippines.

Most horticultural exporters are 'price takers', i.e., they cannot influence either the prices they receive for the products they sell or the prices they pay for inputs in international markets. However, since non-production costs can constitute up to 70 per cent of the final import price of horticultural products, the success of a country in exporting horticultural products might depend more on how efficiently and effectively processing, distributing, marketing, and transporting are organized, than on the actual cost of cultivation. Thus, seeking possibilities of reducing costs and increasing efficiencies in both domestic and international distribution should be intensified. Besides investments in infrastructure such as roads and markets, the experience of Thailand points to the potentially important role of government assistance in scientific, market, and economic research. Important areas of re-

search may include identification of specific products, varieties, acceptable packaging, volume of turnover, pricing, recipient country avenues of reception, inspection standards, and distribution. Assistance in gaining market access by supporting promotional efforts aimed at influencing consumers' preference patterns in importing countries may also fall into the public goods category⁸.

In addition, the importance of public sector investments in transportation and marketing infrastructure (including export grading, packing, and inspection services) cannot be underestimated. Domestic production and marketing structure must be adequately developed before serious exporting efforts can be considered. On the production side, effective transfer by the extension services of information and technology on appropriate production practices constitutes a fundamental function of an efficient agricultural marketing system. A continuous supply of timely and up-to-date information regarding the import markets' requirements is another crucial element in a successful export promotion strategy.

Many authors have suggested that both domestic trade policies and macro-economic government policies significantly influence export performance (Arnade and Lee 1990, Athukorala 1991, Burfisher *et al.* 1991, Evans 1990, Honma 1991, Islam 1991, Maziruddin 1990, PSL 1989, Scobie and Youngblood 1990). Elements of such policies include assurance of adequate availability of inputs including fertilizers, water, packaging materials, credit, and the right mix of consistent incentives to both producers and processors. A conducive macro-economic policy should allow price signals from

⁸ Market research and promotion are activities which are particularly suited to government assistance, especially in the case of largely generic products such as most fresh fruits and vegetables. Experience with heavily promoted items such as avocados or kiwi suggests that the introductory period can extend over several years before consumers become familiar with a new product and make regular, significant purchases. Therefore, individual entrepreneurs may be hesitant to develop a new export market because others might appropriate the benefits before the initial market development costs can be recuperated. Promotion levies paid by all members of an industry may constitute an alternative to government assistance.

international product and factor markets to be clearly transmitted to domestic producers. Therefore, it should avoid excessive implicit or explicit taxation, overvalued exchange rates and import quotas. To be able to generate a steady supply of high-quality horticultural products that are well-tailored to consumers' specifications in the importing countries, maximum cooperation is needed between the private export sector, the public sector, the research community, and growers.

Another potential area for government intervention on which this paper has not touched is the mounting public concern regarding the sustainability of intensive horticultural production. People in both producing and importing countries become increasingly concerned about the widespread and intensive use of chemicals and their effects on human health, occupational hazards in applying them and environmental effects. In addition, the conservation of natural ecosystems receives increasing attention. Indeed, there is ample evidence that the use of purchased inputs in general, and that of pesticides in particular, has increased dramatically among Asian horticultural producers, causing increasingly serious adverse external effects (Hossain 1990, Inayatullah 1990, Lim *et al.* 1988, Midmore *et al.* 1993, Vattanatangum 1990, Wivutvongvana *et al.* 1989). However, the desirability and ultimate effects of government intervention are often controversial (Dumsday *et al.* 1990, Randall 1985). Moreover, recent research has counterattacked the view that continued heavy use of pesticides is unsustainable. For example, Stroup (1991) presents evidence from the US to show that the use of chemicals has significantly contributed to higher standards of living and healthier lives. This suggests that the positive impacts of environmental and occupational health regulations may be outweighed by the damage to health and safety that they cause by reducing income growth. In any case, the way in which countries address growing environmental concerns and the measures taken to achieve sustainable land management to maintain a productive natural resource base will have important implications for the future growth and development of their horticultural sectors.

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