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***MALAYSIAN AGRO-PROCESSING INDUSTRY :  
PRODUCTION, DOMESTIC CONSUMPTION  
AND EXPORTS***

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**MALAYSIAN AGRO-PROCESSING INDUSTRY :**  
**PRODUCTION, DOMESTIC CONSUMPTION AND EXPORTS**

**1. Introduction**

This paper examines the production, domestic consumption and export potential for Malaysian agricultural products. Emphasis is given to major export products which include palm oil, rubber, cocoa, fruits and vegetables. The approaches taken in assessing the export potential are the past performance and market share.

**2. Agriculture Situation**

The agricultural sector remains as an important sector in Malaysia, despite the decline in its share of the Gross Domestic Product, from 23% in 1980 to 14% in 1995. A study by Mad Nasir and Alias [1996] indicates that the growth in agricultural production between 1960 to 1993 has been significant, at an average of 5.6% per annum. As a result agricultural production in 1993 was about four times that of 1960. This relatively high growth rates was partly due to the combined results of increase in factor inputs and improvement of productivity.

Malaysian agricultural products can be classified into two main subsectors, namely, industrial and food commodities [Table 1]. Industrial commodities include palm oil, natural rubber, cocoa, pineapple, pepper, forestry, floriculture and tobacco. Food commodities include fruits, vegetables, rice, fisheries, livestock and feed production and coconut. The former subsector especially rubber, palm oil and cocoa has basically dominated the Malaysian agriculture. In fact, the industrial crops became the driving force behind most of the growth and development in the agricultural sector. Overtime, Malaysia became the leading exporter of palm oil and rubber.

In 1992, the industrial crops contributed RM21.9 billion [22%] of the country's total export earnings. However, due to high import bill of some RM4 billion annually, as well as to find new sources of growth, greater emphases has been given to food production since the introduction of National Agricultural Policy [NAP] in 1984. As such, the cultivation of fruits and vegetables were encouraged, and are expected to grow at higher rates than the major industrial crops at 8.5% and 5.8%, respectively, before the turn of the century.

The agricultural production system can also be divided into two, namely, estate and smallholder sectors. The estate sector is an efficient and well organised sector, and engaged in export oriented production of industrial crops. The smallholders, on the other hand, are less efficient with uneconomic-sized holdings. This dichotomy resulted in the disparity in the level of productivity, competitiveness, and hence income. In view of these dualisms as well as the required role of the agricultural sector in national development, the government formulated a National Agricultural Policy in 1984.

### **3. Policy Environment**

Prior to the introduction of National Agricultural Policy [NAP] in 1984, there were no integrated agricultural policies to guide the agricultural development. The development was solely commodity-oriented and the policies as regards choice of crops were "independent to one another, each concentrating on its goal". The policies, often formulated in response to prevailing economic and technical changes, therefore tended to have short-term perspective. The non-integrated approach was said to have resulted in differential rates of development in the various agricultural subsectors and inefficient use of resources.

Realising the importance of agriculture, and thus rural socioeconomic development, the first NAP was launched in 1984 with the objective to maximise income through the revitalisation of the agricultural sector and the efficient use of resources. The NAP 1984 has generally been effective in guiding resource allocation, cropping patterns and output growth. Value-added growth in agriculture grew at 4.6% per annum during the period 1986-90, compared to 3.1% for 1981-85. However, the NAP failed to address the increasing income and productivity disparity between the agricultural sector and the rest of the economy, in particular the manufacturing sector. The value-added growth in agriculture at 4.6% during the 1986-90 period was much less than of the manufacturing sector at 13.7%. The growth of the manufacturing sector is, partly, due to the favourable macro-level policies such as fiscal and monetary policies.

The second NAP (called NAP 1992-2010), replaces the first NAP, which has similar overriding objective as in the NAP 1984, emphasises different specific objectives using different strategies. The specific objectives include the achievement of a balanced development between agricultural and manufacturing sector, the enhancement of the integration of the sector with the rest of the economy, particularly the manufacturing sector, the achievement of a higher level of development of food industry and the attainment of sustainable development in agriculture. The strategies that are formulated include optimisation of resource use, acceleration of agro-based industries development, enhancement of R&D effort and technological diffusion, leading role of the private sector, reformed marketing and expand food production.

The focus on marketing and exports of agricultural commodities is as follows:

- Successful marketing of agriculture will become a necessity and a preconditioned for further growth in the export market which is anticipated to become more competitive and sophisticated in an environment of uncertain multilateral trade framework. Agricultural product marketing will be based on a *proactive and industrial marketing strategy*.

- Further entry into world markets especially for primary products calls for *an efficient product marketer strategy* rather than that of a commodity trader to minimise the disadvantages of being a price taker. Marketing must respond not only to price signals but also be sensitive to changing consumer preferences. It also involves in the creation of new demands and uses, product innovation and differentiation, market segmentation and market niches.
- The agricultural marketing strategy will exploit the potentials of trading blocs and preferential *trading arrangements*, whilst overcoming the market access limitations including non tariff barriers, in particular, through offshore investments and reverse investments.

#### 4. Agricultural Incentives

In line with the NAP, the government has extended various tax and financial incentives to attract investments in the agricultural sector as well as to promote the export of agricultural products. The tax incentives are basically provisions for total or partial relief from income tax. These incentives are given under the Promotion of Investments Act 1986 (PIA). In determining the activities and products that qualify for the incentives, the Ministry of International Trade and Industry (MITI) will take consideration the following:

1. Whether or not any activity is being carried out or any product is being produced in Malaysia on a commercial scale suitable to the economic requirements or development of Malaysia or at all;
2. Whether there are:
  - (i) favourable prospects for further development of the activity or product; or

(ii) insufficient facilities in Malaysia to enable the activity to be carried out or a product to be produced on a commercial scale suitable to the economic requirements; or

### 3. The national and strategic requirements of Malaysia.

Under Gazette Notification No. P.U. (A) 391 dated 13th November 1986, all agricultural production activities except for the planting of rubber, oil palm and coconut have been gazetted as promoted products or promoted activities. Cultivation of cocoa, fruits (citrus, apples, grapes, stone fruits, or other temperate fruits), vegetables (onions, garlic, shallots, leeks or other alliaceous vegetables) and tuber or roots (potatoes, beans, peas, lentils, mushrooms, chilli, and temperate vegetables such as carrot, asparagus, brocolli and cauliflower) are qualified under this act.

The tax incentives are in the form of Pioneer Status, Investment Tax Allowance (ITA), Agricultural Allowance, Export Allowance and Research and Development. In the export allowance, a 5% of f.o.b. values is given to residential agricultural cum exporting companies, agro-based cooperative, associations, sole proprietorship and partnerships which are solely engaged in the production and export of agricultural produce. The financial incentives include New Investment Fund and Planting and Rehabilitation Subsidy Scheme. The details explanation of the incentives can be found in Lim (1991) and Ministry of Agriculture (1994). The agricultural projects approved with tax incentives from 1986 to 1991 are shown in Appendix I.



## 5. Horticultural Commodities

### 5.1 Fruits

#### 5.1.1 *Production, Domestic Consumption and Exports*

The area and production of the main varieties of fruits in Malaysia are shown in Table 2 and 3, respectively. Production of durians, manggo, banana, melons and rambutan have been on the increase, reflecting a rising demand for these fruits domestically and export markets. The production trend of other fruits appear stable, especially for jack fruit, carambola and mangosteen. Papayas, guava and pineapple, however, showed a downtrend.

Domestic consumption varies considerably between each fruit type. Bananas and durian are by far the most important followed by watermelon, lime and papaya. The consumption trend of these fruits and other types of fruits (carambola, cempedak, sarpodila, duku/langsat, guava, pamelon, mangosteen, mango, jack fruit, pineapple and rambutan) has been rising from 432,819 tonnes in 1988 to 557,951 tonnes in 1995.

Export of fruits are increasing as indicated by the export trends, presented in Table 4, over the last 10 years (1986-1995). Total exports in 1986 were valued at RM58.8 million, increasing to RM142.4 million in 1990 and RM163.5 million in 1995. Major fruits exported are banana, durian, papaya and watermelon. Among the new entries in the exports since 1987 and which show export potential are carambola, papaya exotica and to a smaller extent mangosteen and rambutan.

In terms of export destinations, Singapore is still the traditional market, accounted for about 70-75% of the total value exported (Tables 5 and 6). The main varieties exported to Singapore are durian, watermelon, papaya, banana, carambola and rambutan. The high percentage exported to Singapore are partly due to the geographical proximity, well

established transportation system and high purchasing power. Currently, Malaysia is facing stiff competition in the Singapore market mainly from Thailand.

Hong Kong ranks second in terms of export destination. Over the past decade, Malaysia has increased her range of fruits exported to Hong Kong, namely carambola, papaya and watermelon. Like Singapore, high purchasing power of the population coupled with a free-trade make Hong Kong an attractive market outlet for Malaysian fruits.

Malaysia also exported her fruits to new markets. These include Western Europe, West Asia and recently, South Korea. Exports to Western Europe have centred around Netherlands, West Germany and the United Kingdom. The main varieties exported to these destinations are carambola and papaya. Exports to West Asia, mainly Saudi Arabia, the United Arab Emirates and Kuwait are basically on a small scale. The varieties exported are papaya, carambola, guava and bananas. Exports to South Korea is still very small, and the fruit exported is mainly banana.

Japan provides a very big market for a range of tropical fruits. However, there are very strict quarantine regulations on the importation of such fruits. Currently, the only fresh fruits which are allowed to be imported into Japan are pineapples, durian and bananas. Other fruits such as mangoes, papayas and rambutans are prohibited into Japan, except in processed form, due to the fruit fly problems.

### **5.1.2 Issues**

- The fruit industry is facing supply irregularity and seasonality, unorganised smallholdings and the general unsuitability (low quality) of fruits varieties for most downstream activities. Non-standardization of product quality and grades and high costs of collection have further compounded the supply problems.

- High Production Cost -- the cost of production for pineapple for example is higher than Thailand, Philippines, Indonesia and Central America. The main reason for the high production cost is scarcity of labour.
- The production (producers or farmers) and exports (exporters) sectors are still not coordinated.
- In the international arena, Malaysia is facing increasing competition from several countries in related markets. Malaysia has to compete with South American countries in European, North America and Canada. African countries post competition in Europe and Middle East markets. For Singapore, Hong Kong, Japan, South Korea, Middle East and European markets, Malaysia has to competes with her neighbouring countries, mainly Thailand, and to some extent Indonesia and Philippines.
- The present resources that Malaysia devotes to fruit production are not sufficient for its long-term investment.
- Agricultural extension activities is still concentrated at the production level. However, fruits being perishable goods, the quality is affected by the marketing activities like handling, storing and packaging.
- Technology Related Issues:
  - Packaging container* -- The utilization of proper packaging containers especially CPB is still quite limited. The exporters are quite reluctant due to it high cost. The initial investment of using CPB is high, although it will be highly profitable in the long run (Hassan and Mohd Salleh, 1992).
  - Treatment technology* -- The technology on insecticides treatment by using Vapour Heat Treatment (VHT) for example is from overseas and come about only after the USA insisted that produce exported to the USA must undergone the process.

*Post-handling loss* -- The loss or damage due to post-harvest handling is relatively high. Study to decrease the percent loss is necessary. The loss could be decrease through proper handling, storage and packaging.

*Inefficiency of transportation technology by sea shipment* -- The shelf life of the produce during sea shipment need to be increase. This include developing technology of transportation and packaging for the respective fruits. For example at present, the shelf life of the pineapple is about 10 - 15 days for transportation and another 10 days for distribution. When the transportation period is lengthen to 14 days, the pineapple become very ripe and prone with black heart disease (Anonymous, 1995). Increasing the shelf life during transportation would make if feasible for Malaysian pineapple to be exported to Europe.

*Variety improvement* -- The current available variety of some of the fruits are not suitable to be exported by sea shipment which need more than 5 days (example, pineapple).

*Packaging operation* -- The size of the packaging houses is relatively small and the operations are mainly done manually.

*Standards grade* -- There are still some fruits which do not have standard grade. The produce are usually graded by the intermediaries.

### ***5.1.3 Exports Potential***

The discussion in the earlier section indicates that the exports of Malaysian fruits are largely still to regional markets such as Hong Kong and Singapore, and the exports in Western Europe are restricted to only 1-2 main varieties.

Based on the past export performance, Singapore is the most obvious export destination for Malaysian fruits in the future. The market is expected to be growing. The Malaysian market share in Singapore is shown in Table 7, ranges from 91% for banana to 99.1% for papaya. Avocado, mangos and guava are at the lower range, around 50%. It indicates that Malaysian exports still control a major portion of the market for fresh tropical fruits.

For Hong Kong market, due to its relatively geographical proximity, shipments by sea are possible. Combined with Singapore, the Hong Kong market can absorb the bigger-sized fruits not preferred in Europe. Such market segmentation is very conducive in the strategic marketing plan to more distant markets.

Western Europe represents the market to be exploited in the future. The late 1980s and early 1990s periods have seen progress being made in this direction. Thus far only carambola stands out as the main fruit variety that has seen consistent growth. The market potential for selected fruits in Western Europe is presented in Table 8. In general, carambola shows better prospects than other fruits. The growth in exports to Western Europe is projected by FAMA in late 1990s at around 30-50%. The realisation of this export potential, however, depends on securing the cost-competitiveness of its products by overcoming the lack of technology to ship most fruits in bulk by sea.

#### **5.1.4 Handling Technology for Exports**

##### **5.1.4.1 Maturity Index for Harvesting**

Maturity can be determined by visual means (colour and appearance), physical characteristics (specific gravity and texture) and computation (date from flowering and sowing), chemical characteristic (sugar, total soluble solid, starch) and physiological means (respiration rate, ethylene production) (Pantastico, 1992). Malaysian fruit growers use visual means especially skin colour development for fruits such as mango, papaya,

pineapples, mangosteen, carambola, banana and rambutan. The growers also use computation method for mango, banana, carambola and rambutan (Noraini et al., 1991).

The actual maturity level for harvesting depends on the destination and the type of transportation used for exporting the produce. Table 9 list colour index of some Malaysian fruits. For export purposes, Malaysian bananas and mangoes are harvested at about 7 to 9 weeks (70 to 80% maturity) and after 13 to 16 weeks after flowering, respectively; guava are harvested when fully matured or about 16 to 20 weeks of fruit-set (depends on the variety). Papaya excotica, carambola and mangosteen are harvested at colour index of 2 or 3 depending on the destination and type of transportation involved; for papaya exotica the skin colour should be green with a trace of yellow or more green than yellow, for carambola it should be mature green or yellowish green and for mangosteen the skin should be reddish yellow or pale red. Because of its short distance, fruits which are sent to Singapore can be harvested at more mature stage.

#### **5.1.4.2 Harvesting Technique**

To reduce mechanical injury of the fruits, proper harvesting tool should be used. In Malaysia, carambola, guava and pineapple are commonly harvested by hand, using secateurs or knives. Mango, papaya, mangosteen and rambutan are often harvested by using a long pole with a ring and catching net or secateurs at the end (Mohd Salleh and Abdullah, 1989).

Improper usage of containers also increases the incidence of mechanical injury. Lining materials such as newspaper or broad leaves have been recommended to minimize injury resulting from the direct contact of the produce against the sides and sharp edges of the containers made from bamboo baskets. Returnable plastic containers is still not widely used. Gunny sacks, bamboo basket and plastic bag are usually used as containers. Plastic bag can cause the produce to quickly warmed up and deteriorate very fast (Hassan and Mohd. Salleh, 1989). The containers filled with fruits are then stacked on a trailer drawn

by a small tractor. For bananas, the fruit bunches are arranged into the lorry by placing a foam between the bunches to reduce injury to the fruits (Abd. Shukor et al, 1989).

#### **5.1.4.3 Packing house operation**

The size of the operation is usually small; more than often the operators convert shop houses into packing houses. These small packing houses use only simple equipment and the operation is done manually; however there are some packing houses such as FAMA which have a complete packing line with semi-automatic operation.

#### **5.1.4.4 Sorting, trimming and washing**

Fruits which are injured, damage, off-flavoured, under and over matured, misshaped, are renewed. Those which do not satisfy to the minimum quality requirement by the exporters and/or specified by SIRIM standards are not utilized. The fruits are then dipped into clean water or wiped with wet sponge to remove dirt, foreign matter and latex from some fruits such as mangoes, papaya and banana.

#### **5.1.4.5 Fungicides / Insecticides Treatment**

After cleaning, carambola for export are classified and graded without going through any fungicides treatment. However fungicides treatment are needed for papaya, mangoes, banana and guava to eliminate diseases. The exotica papaya are soaked in warm water twice (42°C, 30 min; 49°C, 20 min) followed by cooling in an ambient water and fungicide solution. The papaya can also be soaked once in warm water (49°C, 10 min) followed by cooling in ambient water (25-30°C; 10 min) and fungicide solution. The fungicide solution used can either be propiconazole (250 ppm; 5 min), benomyl (500 ppm; 20 min) or prochloraz (500 ppm; 2 min). Big papaya are soaked in 500 ppm benomyl (49°C, 20 min) followed by cooling in ambient water before drying. Mangoes are dipped in an 800 ppm benomyl solution (52°C, 5 min) whereas Mas banana use 200-500 ppm benomyl solution or thiobendazole (Noraini et al., 1991).

Vapour heat treatment is currently practiced for papaya which are exported to the USA. The method is claimed to prevent contamination from insect such as Mexican fruit flies, Oriental fruit fly, Mediterranean fruit fly and melon fly. In the process, the papaya are exposed to hot temperature vapour at 43 - 45°C until the internal temperature of the fruit equilibrate and then held at that temperature for 8 hrs. The papaya are then cooled and packed for export. The method is also suitable for pineapples, tomatoes, citrus fruits and capsicum.

#### **5.1.4.6 Grading**

Grading is carried out based on the size, maturity level and other quality attributes of the fruits. Fruits which are injured, damaged, under and over matured and missaped are not utilised. The size and level of maturity depends on the export destination. For example, European market usually prefer carambola which are medium in size (18-24 pieces / 3.5 kg box whereas for Singapore and Hong Kong markets are usually bigger in size. Those which are firm and have maturity index of 2 or 3 are usually selected for export to Europe; however, about 50% are sent to Singapore and Hong Kong because of they have higher maturity.

#### **5.1.4.7 Packaging**

For Singapore market, bamboo baskets are commonly used. Although returnable plastic containers have been introduced to replace bamboo baskets, its use is still limited. The main problem experienced by the owners of the returnable plastic containers is the inability to ensure that the baskets are returned to them.

Fruits are usually packed in returnable plastic containers or corrugated fiber board (CPB) with sufficient ventilation holes. Foams, sponges, newspaper, tissues, polystyrene foam net and polyvinyl chloride film are usually used as cushioning materials between fruits and



packaging surfaces to prevent bruising during further handling. Carambola use polyvinyl chloride film and polystyrene foam net.

Another method to prevent insect contamination is by modifying the fruits environment to contain 2-5% oxygen and 10-15% carbon dioxide. The latest technique is by wrapping the produce and placing them in a box lined with polyethylene (PE) of 0.04 mm in thickness; ethylene gas absorber (potassium permanganate) is placed in the box in order to prevent the fruits for ripening during transportation.

#### **5.1.4.8 Storage**

For produce that need to be exported by sea shipment, the freshness must be preserved during long period of time before they can reach the intended consumers. This include the periods of packing, land transportation, waiting at ports of embarkation, shipping and market distribution. The total handling periods for export from Malaysia to Hong Kong, Japan and Europe may take up to 2-3, 3-4 and 4-6 weeks respectively (Hasan and Mohd Salleh, 1992).

Generally the storage life of the local fruits can be extended by refrigeration (1-4 weeks at 0-15C and 85-90% relative humidity). This period however is still not adequate for sea shipment. The produce must be harvested at the right maturity stage and treated accordingly. Refrigerated storage produce have problems of chill injury due to exposure to temperatures below the optimum, disease infection due to fungal attack and yellowing due to senescence and accumulation of ethylene inside the storage room (Noraini et al., 1993). If the relative humidity of the cold room is low and proper moisture barrier is not applied, most vegetables experienced shriveling and weight loss. Treatments such as waxing, fungicides and packaging should be coupled with refrigerated storage.

Although CA storage has been proven effective and used commercially for static storage of apple, kiwifruit, pear, strawberry and onion, its use in transportation of fresh horticultural produce is still on a trial basis, and not widely used.

MA storage has been used as a standard technique in transporting Cavendish banana over a long distances by many countries. For Malaysian banana, MA has been shown to be effective (storage life of 8 weeks at 14°C) for Pisang Mas and quite encouraging results for Pisang Berangan. However, the technique is still not commercially practiced. Long term storage of other fruits and vegetables under MA for export purposes, however are not very encouraging (Hassan and Mohd. Salleh, 1992)

#### **5.1.4.9 Transportation**

Most local traders still prefer to use bamboo baskets or handling in bulk as in the case of banana and pineapple. The use of refrigerated truck to transport produce to Singapore is not practical as most production areas in Malaysia are so close to Singapore that it takes less than 12 hours by lorry. The lorry usually travel at night to benefit from the cooler night temperature. The use of bamboo basket is still preferred and considered adequate over corrugated fiberboard cartons, returnable plastic containers and packing in ice.

#### **5.1.5 *Quality Standard***

Table 10 shows the Malaysian Standards (including methods of sampling) on fresh fruits and vegetables. The standards are prepared by the Technical committee on fresh and processed fruits, with representative from Federal Marketing Authority (FAMA), Malaysian Agricultural Research and Development Institutes (MARDI), Universiti Pertanian and Kebangsaan Malaysia, Association of Malaysian Food Exporters, and Standards and Industrial Research Institute of Malaysia (as secretariat).

Generally the standards contain i) Definition of various terms related to the respective fruit such as overripe, well-form, blemishes, off-size fruit, ii) General Quality Requirement, iii) Grading which prescribes the various requirement for Grade Premium, Grade I and Grade II , iv) Tolerances Limit for defect and off-size fruits of each grade, v) Packing, vi) Marking , vii) Sampling, and vii) Compliance. The classification and grading scheme are shown in Appendix II.

Grading scheme for carambola exports to Western Europe has been established. Grades and quality standards for eksotika papaya and other fruits also have been prepared. Grading scheme should be established for selected fruits in order to facilitate the exports on a specification rather than inspection basis to ensure importers' requirement are technically met. It also will reduce the inspection and handling cost and overcome the existing uncertainties of the consignment system by a more certain price-quality terms of sale (Mohd Yaacob, 1992).

#### **5.1.6 Research and Development in Fruits for Export**

Research and Development in Malaysian fruits are currently carried out mainly by MARDI, Universiti Pertanian Malaysia and FAMA. Intensified research has been carried out on fruits which have export potential. In the sixth Malaysian Plan under Intensify Research Priority Area (IRPA) programme (1991 - 1995, MARDI concentrated their research on papaya, mangosteen, carambola, mango and sapota) whereas Universiti Pertanian Malaysia focused on carambola, banana, sapota, pineapple and guava.

The area of research in MARDI can be summarized as follows (MARDI, 1992)

- Development of technology of quarantine treatment to satisfy the quarantine needs of the exporting countries. This include chemical treatment (fumigation), low temperature treatment (freezing), heat treatment (VHT) and irradiation treatment (gamma ray).

- Development of technology for suitable post-harvest handling to maintain high quality while increasing the shelf life. This include the determination of maturity level for harvesting of fruits intended for export.
- Development of suitable package technology in commercial way - from production to marketing of fruits. This include marketing study of fresh and processed fruits and downstream research such as grading, packaging, storage and processing of fruits.

Universiti Pertanian Malaysia is currently work on topics below:

- Chilling storage of sapota, carambola, papaya and pineapple
- Post-handling and packaging technology of carambola, papaya, guava and sapota
- Vapour heat treatment of guava
- Maturity index of Cavendish banana

FAMA on the hand is doing research on post-handling, market and shelf life studies during transportation of different fruits to other exporting countries.

### ***5.1.7 Strategies***

The strategies that Malaysia should adopt to spearhead the export growth of the fruits industry are:

- Areas of common interest between the producer and exporters such as quality standards and consistency in shipments, uniformity in pricing and market promotion should be coordinated.
- Since Malaysia is still lag behind of its competitive advantage, Malaysia should pursue expressively in fruit production and export marketing management program with R&D and market promotion as critical components.

- Aggressive promotion of Malaysian fruits commenced in 1988. However, the promotional efforts has concentrated at the importers/distributors level only. Malaysian tropical fruits should be given an improved national image and promotional activities must be directed at increasing consumer-awareness.
- Exporters must be sensitive to the quality, grades and packing requirement of importers overseas. So far, FAMA has implemented a grading scheme for carambola exports to Western Europe.
- One of the problems in marketing extension is that most staff involved in this work do not have sufficient expertise. More training in marketing, trading and marketing extension must be given. In this respect, the marketing extension role of FAMA should be enhanced.

## **5.2 Vegetables**

### ***5.2.1 Production, Domestic Consumption and Exports***

Malaysia produces a large variety of vegetables. The area and production in 1994 of the most popular vegetables, shown in Tables 11 and 12, were 24,349 hectares and 427,976 tonnes, respectively. Total supply appears on the downtrend as the vegetable producing areas border major urban areas causing increased competition for land for non-agricultural purposes such as housing and recreational facilities.

The production system is still a smallholder crop with an average farm size of less than one hectare though differences in farm size exist between region. Major producing areas are Perak, Selangor, Johor and Pahang, contributed more than 80% of the total supply.

Almost all vegetables produced in the country are for the domestic market. The domestic consumption is on the rise due to the higher standard of living and greater health awareness. The per capita consumption has increased from 33.9 kg in 1982 to 44.3 kg in 1991 (FAMA, 1991). Thus Malaysia is a net importer of vegetables. Import of fresh, chilled and frozen vegetables in 1993 valued at RM314.2 million. Major portion of the imported vegetables are not grown locally. Major import sources in recent years are Indonesia, Thailand, Australia and, in small extent, China.

The exports of vegetables is only limited to regional destinations such as Singapore, Brunei and Hong Kong (Table 13). The export value increased from RM29.5 million in 1986 to RM101.67 in 1993. Singapore accounts for an average of 70% of total quantity exported.

### **5.2.2 Issues**

- The issue of high pesticide residue in vegetables is a concern in traditional markets such as Singapore and more recently in newer markets such as Brunei. There is also an issue of rising sanitary standards in these export market outlets.
- The market structure is oligopsonist in nature, where the market power is concentrated in the hands of major wholesalers in the urban areas. The market power is perpetuated by a number of factors including high barriers to entry such as high capital requirement, credit ties, inadequate market facilities and to a certain extent lack of timely market information.
- Vegetables are marketed mainly on a consignment basis where by prices received by farmers are only known after delivery. This system makes farmers as price takers.

- Land availability for the production of vegetables is getting limited. Rapid industrialization and urbanization has resulted in the transfer of land, and to some extent labour, from vegetables to other sectors of the economy.

### **5.2.3 Export Potential**

The export potential is only limited to Singapore and to a lesser extent other regional markets such as Brunei, Indonesia and Hong Kong. The exports of vegetables is anticipated to be stagnating or on the decline due to a captive domestic market, increased competition from other regional exporting countries and changes in consumer preference including better packaging, health and sanitary standards.

## **6. Industrial Commodities**

### **6.1 Production, Domestic Utilization and Exports**

#### **6.1.1 Palm Oil**

The palm oil industry has experienced rapid growth during the last three decades to become an important source of oils and fats in the world. It covers about one-third of Malaysia's cultivated area amounting to 2.28 million hectares. Production grew from 0.43 million tonnes in 1970 to 7.22 million tonnes in 1994 (Table 14). The aggressive pursuits of oil palm cultivation which began in the mid-sixties was basically to reduce the heavy economic dependence on rubber and tin and at the same time to enhance the country's economic resilience in the face of wide price fluctuation in the world's commodity markets. In 1994, Malaysian palm oil accounted for about 53% of the world production and 64% of world trade in palm oil.

Before 1975, Malaysia's palm oil was mainly exported in crude form to major industrial countries in Europe, U.S. and Japan. With the advent of the refining sector after 1975,

Malaysia diversified its products into various types of processed palm oil and exported to new markets in the Indian sub-continent, Middle East and Russia.

In the international arena, palm oil competes directly with more than 16 major oils and fats in a highly competitive environment. The major oils and fats are soyabeans, rapeseed, sunflower oils, tallow and butter. Malaysian palm oil accounted 21.2% of the world production of vegetable oil in 1994, second place after soyabean oil (26.4%). Malaysian palm oil relies heavily on the export market as more than 85% of production is exported. The export performance has been impressive with export earnings increased from RM2.6 billion in 1980 to RM8.1 billion in 1994 (PORLA, 1995), and it is the third export earner after petroleum and timber.

#### *6.1.2 Natural Rubber*

The production of rubber has been declining since 1976 when the production figure was 1.612 million tonnes. The production in 1992 is only 1.173 million tonnes (Table 15). The reduction in output is due the structural changes in the Malaysian economy which have diverted resources either to competing crops, notably oil palm, or to other sectors including manufacturing, housing and services. The decline in production is expected to continue in the future due to the continued conversion of rubber land to other uses, while a significant portion of rubber areas, especially in smallholders, remained untapped due to the outmigration of rural labour.

As in production, rubber exports have been declining. The export figure in 1976 was 1.612 million tonnes, fell to 1.034 tonnes in 1992. This declining trend in export volume has been due to the lower production and a simultaneous increase in local consumption, as a result of the rapid expansion of rubber product manufacturing industry. The export performance is mainly determined by, other than domestic production, the auto and tyre industries, which in turn are influenced by global economic and population growth. The



largest importer in 1992 was Korea, accounting for 13% of the total rubber exports, followed by the US (12.4%) and Japan (8%).

### **6.1.3 Cocoa**

The falling prices of rubber and palm oil in the 1970s has led the Malaysian government to diversify the agricultural production. Due to the high prices of cocoa beans in the 1970s, cocoa was thus one of the crops identified in the diversification strategy that has the potential to uplift the earnings of agricultural producers, especially smallholders. The production of cocoa beans has concomitantly increased rapidly over the last two decades. The production in 1993 was estimated at 200 thousand tonnes compared with 5,000 tonnes in 1972, a substantial increase of more than 3000% (Table 16). Such a rapid growth of cocoa production has been due to the application of modern cultivation techniques, giving rise to very high yields, and government policies of providing a strong support to the cocoa industry. The production, however, has been on a declining trend since 1989. The decline in output was due to the prolonged low prices coupled with escalating labour costs which resulted in cocoa trees being left unattended and conversion of cocoa areas into oil palm.

Currently, cocoa is the third important export crop after palm oil and rubber, accounting for 1.8% of the GDP in 1993. Exports of cocoa beans in 1993 was 123 thousand tonnes, amounted to RM 314,539 million. The main destinations is Singapore, followed by Netherlands and Germany; these three importers account for about 70% of Malaysia's cocoa beans exports. Due to the decline in local production and increase in domestic utilization, exports of cocoa beans have been declining since 1988. Export on cocoa products, on the contrary, have been rising (Table 17).

#### **6.1.3.1 Technology of Handling Cocoa Beans for Export**

Malaysia exports about half of the cocoa beans produced locally. Malaysia also exports cocoa mass / liquor, cocoa butter and cocoa cake / powder. The beans must be inspected

and graded before being exported to the destination countries. The beans must be packed in 62.5 kg new, clean gunny sack during transportation to destined countries. The quality requirement for the beans before they can be graded is as follows:

- The cocoa beans shall be from ripe pods, shall be adequately and dried, free from smokey smell, free from objectionable or foreign odour and free from any evidence of adulteration.
- The cocoa beans shall be reasonably uniform in size.
- The cocoa beans shall be free from living insects.
- The consignment of beans shall be free from bean clusters and reasonably free from double bean.
- The consignment of beans shall be free from foreign matter.
- The moisture content of cocoa beans shall not exceed 7.5%.
- The consignment of bean shall contain not more than 2% waste by weight.

The grade specifications for Malaysian cocoa beans is shown below. The numerical code (I, II) reflects the defective level whereas letter code (A, B, C) reflects the beans size.

Standard Malaysian Cocoa Grade	Bean count (per 100g)	Mouldy (%)	Slaty (%)	Insect damaged and germinated (%)
SMC-I-A	≤ 100	≤ 3.0	≤ 3.0	≤ 2.5
SMC-I-B	> 100 ≤ 110	≤ 3.0	≤ 3.0	≤ 2.5
SMC-I-C	> 110 ≤ 120	≤ 3.0	≤ 3.0	≤ 2.5
SMC-II-A	≤ 100	≤ 4.0	≤ 8.0	≤ 5.0
SMC-II-B	> 100 ≤ 110	≤ 4.0	≤ 8.0	≤ 5.0
SMC-II-C	> 110 ≤ 120	≤ 4.0	≤ 8.0	≤ 5.0
Sub-standard	> 120	> 4.0	> 8.0	> 5.0

\* SMC denotes Standard Malaysian Cocoa (SIRIM, 1995)  
Source: SIRIM (1995)

## **6.2 Issues**

Pertinent issues that are besetting the palm oil, natural rubber and cocoa industries are as follows:

### **6.2.1 *Continuous price instability***

Although price instability in all commodities is inevitable (be it industrial or agricultural), the factors that distinguish palm oil, natural rubber and cocoa from the rest are (i) the extreme instability and (ii) the tremendous decline in real terms over the years. Prices are vulnerable and continuously subjected to market pressure resulting from supply and demand imbalances owing to the price inelasticity of demand and the time-lag involved in the adjustment of supply to price changes. The misfit between supply and demand tends to lead exaggerated changes in commodity prices.

While the real prices of these commodities have declined, the retail value of their finished products and cost of production have generally increased. This situation implies that increases in value added in these commodities are not transferred to producers.

To combat price instability, the country has turned to commodity agreements to maintain prices within a much more stable band as in the case of rubber under INRA. Though some stability has been achieved through INRA, the prices are biased to the interests of consumers.

### **6.2.2 *Rising cost of production***

The commodities are slowly losing their competitive edge in the world market due to the increase in labour cost which accounts for 60% of production costs in the case of rubber and 40% for palm oil. Malaysia's rivals like Indonesia and Thailand have the advantage of favourable physiological conditions and an abundant supply of arable land and labour.

### **6.2.3 Market structure**

The structural deficiencies at the various levels of the industry from the farm to processing to export levels, are not conducive to efficient marketing decisions. For instance, the fragmented structure of both production and marketing contribute to a weakened bargaining power - as there are too many exporters competing for the same market. The buyer's side is generally characterised by a monopolistic structure particularly for rubber market. These buyers - having the advantage of economies of scale - are in a better position to bargain for better prices.

### **6.2.4 Trade barriers and Constraints**

In the international scene, the commodities have to undergo trade barrier hurdles, foreign exchange constraints faced by importing countries and inadequate physical facilities. The escalation of tariff and non-tariff barriers with the degree of processing continues to hamper efforts at diversification in developing countries.

The areas of the world where there is considerable scope for a sustained increase in the consumption of the commodities are the central and eastern Europe and developing countries of latin America, Africa and Asia. However, these areas are frequently constraint by foreign exchange problems such as (i) the high cost of imported oil into these countries, (ii) severe balance of payments mainly due to high capital-repayment commitments, arising largely from the relatively high interest rates and (iii) low export earnings. The weak foreign exchange position of these countries makes them vulnerable to the pull of concessional trade payment terms offered by other exporting nations particularly the US.

Many existing and would-be markets, particularly for palm oil, are greatly handicapped by the absence of adequate receiving terminals or storage facilities. These countries have not as yet developed proper port receiving terminals or processing plants for palm oil.

### **6.2.5 Productivity**

The smallholder sector is still lagging behind the estates, as reflected by the smallholders' low productivity. The poor performance of the sector is attributed to non-optimum production and marketing practices and financial constraints. Farm management practices are still very much below the recommended ones. This problem is particularly pertinent among the independent smallholders.

## **6.3 Export Potential**

### **6.3.1 Palm Oil**

A study by Fatimah, et. al. (1995) on the competitiveness of palm oil exports using a Constant Market Share (CMS) analysis indicates that despite a shrinking market share in the crude palm oil (CPO) trade, Malaysia is able to secure a significant and increasing market share in the world processed palm oil (PPO) trade. The revealed comparative advantage analysis suggests that Malaysia does has comparative advantage in the processed palm oil sector. Thus palm oil will continue to contribute significantly to the growth of the agricultural sector. Its contribution to total agricultural value-added is projected to increase from 41.5% in 1995 to 43.1% by the year 2000 (7th Malaysia Plan). As regards production, it is projected to increase marginally at a rate of 1.3% and 0.7% in the 1996-2000 and 2001-2005 periods, respectively. This increase is mainly due to yield improvements and expansion in hectareage in the smallholdings. The smallholders' yield is expected to increase at a rate of 1.3% in the projection period.

Export of palm oil will continue to be firm in the next decade. This is based on the estimated increase in domestic production, increase in world demand of oils and fats by 2.5% and the estimated reduction in world opening stocks of oils and fats by 5.4%.

### **6.3.2 *Natural Rubber***

Estate production of natural rubber is projected to decline at an average annual rate of 3%. The estate production is at 274,676 tonnes in 2000, and declining to 226,986 tonnes in 2005. The decline in the estate sector, however, is offset by an increase in the production by the smallholder sector at 1,015,592 tonnes in 2000 and 1,080,203 tonnes in 2005. The total production is thus projected to remain stable over the 1996-2010 period. The reduction in the estate production is due to the decline in the area planted and area harvested.

With the reduction in the production, exports of rubber are also projected to decline at a rate of 2.3% in 1996-2000 and 1.6% in 2001-2005. The exports are projected to be 1,044,478 tonnes in 2000 and 961,843 tonnes in 2005. The domestic utilization is forecasted to increase significantly at a rate of 8.8% in 1996-2000, slowing down at a rate of 3.9% in 2001-2005. The domestic utilization figures are forecasted to be 473,166 tonnes in 2000 and 573,458 tonnes in 2005. The projections are consistent with the study by Alias and Suleiman (1993) on the competitiveness of Malaysian rubber using a Constant Market Share (CMS) analysis. The findings of the study suggest that there appears to be a weakening in the competitiveness of Malaysian rubber. This is due to the supply factors and rapid increase in the domestic consumption.

### **6.3.3 *Cocoa***

A Constant Market Share (CMS) study by Mad Nasir, et al., (1995) suggests that for cocoa beans the size of market effect is the most significant source of growth, compared to distribution and the competitiveness effects. This means that the growth of Malaysian cocoa beans exports is due to the rising world demand, the main determinants of which are population and income growth. For cocoa products such as cocoa butter and cocoa powder, the gain in exports was mainly due to competitive effect. The revealed comparative advantage ratios in general indicate that cocoa beans show a declining comparative advantage, while cocoa products, except cocoa paste, show rising

comparative advantage. Thus this indicates cocoa products, namely cocoa butter and cocoa powder, have great export potential, and cocoa beans has declining export potential.

Projections by Webb et. al., (1995) indicate that cocoa production is anticipated to decline at a decreasing rate from 1996 to 2010. The rates of decline are 5.3% in 1996-2000, 4.2% in 2001-2005 and 3.8% in 2005-2010. The reduction is mainly due to the decline both in area planted and area harvested. The yields in both the estate and smallholder sectors are projected to improve slightly at around 2% over the 1996-2010 period.

Exports of cocoa beans is also projected to decline at 14.4%, 12.9% and 20.1% in the 1996-2000, 2001-2005 and 2006-2010 periods, respectively. This decline is due to the reduction in production and increase in domestic utilization of cocoa beans. The domestic utilization is expected to rise at 0.5% in the 1996-2010 period. Imports are also projected to increase at about 16.5% in the same period.

#### **6.4 Strategies**

Strategies and approaches that can improve marketing efficiencies, among others, are:

- While efforts in agricultural production research and extension are vigorous, it appears that marketing and marketing extension have not been fully emphasised and developed in the past (Mad Nasir and Abu Hassan, 1992). In the chain of agricultural development, marketing in general and marketing extension in particular appears to be the weakest link. This lack of emphasis on marketing extension has been due to greater attention being given to other aspects of farming, lack of suitably trained personnel and the complexity of the marketing system. Thus marketing extension should be emphasised not only to the smallholders but also to all marketing intermediaries. Attempts to bring about changes in farmers' outlook and in marketing practices at the farm level without initiating changes further up the marketing chain have little chance

of success. All government agencies involved in the development of smallholders should accord high priority to undertake marketing research and extension.

- In the international front, a large share in world production does not guarantee market power. The wide disparity between the retail value of the final product vis-a-vis the farm price and the inelasticity in supply and demand makes it impossible for the producers to secure a stronger bargaining power. One of the ways to improve the country's position is by improving the marketing policy from being a primarily supplier of agricultural raw materials to a marketer of agro-based products where the benefits of value-added are accrued to the country and not to the foreign consumers. This policy shift implies a change from a production-oriented strategy to a more market-oriented strategy. In other words, programmes should be directed towards market-expansion, not necessarily through quantity but through quality improvement, market segmentation through product differentiation and diversification, and providing services relating to the commodities. This change in emphasis would also imply the need to upgrade technology through R&D and policies to enhance industrialisation.
- In view of rapid technological development, Malaysia's products have evolved into processed industrial raw materials. Thus industrial marketing strategies should be replicated and implemented wherever applicable. The products should be treated like an industrial output where marketing is subjected to rigid planning, monitoring, precise grading and specification.
- In the past, Malaysia competed in the world market purely on price strategy. In view of the continuous increase in domestic cost of production, price strategy is obsolete and could be ineffective in near future as other producers like Indonesia and Thailand are enjoying the advantage of low production costs. Malaysia has to continue striving to differentiate and diversify her products. For instance, dependence of rubber on the tyre industry should be reduced through further end-use diversification to capture other sectors, in particular the general product sector. According to the World Bank



(1988), rubber consumption growth in the tyre sector has been falling to an average of 2% per annum. Malaysia's SMR-type rubber should be further upgraded, especially in terms of processability, consistency and homogeneity, so that they can be appropriated and differentiated in the market place in terms of price, quality and end-use application. In the case of palm oil, it should be differentiated from palm oil produced by other countries through further downstream activities, standardisation and quality control. In short, marketing of rubber and palm oil should be segmented on the price, technical factors and consumer preference to achieve maximum results.

## 7. Conclusions

The central theme of this paper is to assess the export potential of Malaysian agricultural commodities, namely, fruits, vegetables, palm oil, rubber and cocoa. The past export performance and market share of the products are employed to indicate the export potential.

The market potential of fruits is anticipated to be bright. The main destination is still the regional markets such as Singapore and Hong Kong. Exports to Western Europe is also expected to be growing, around 30-50%, in late 1990s. The realisation of the potential to Western Europe, however, depends on securing the cost-competitiveness by overcoming the lack of technology to ship the fruits in bulk by sea. Nevertheless, standards for maturity level of most fruits to be harvested for exports have been established. The utilization of plastic containers during infield operation is still limited. Most packing houses which operate manually and use simple equipment should be upgraded. Grading for size and level of maturity is very much dependent on the destination of the produce; fruits exported to Hong Kong and Singapore markets are bigger and more ripe compared to those exported to Europe. Fungicide treatment is needed for banana, guava, papaya and mangoes but not for guava. In transporting the produce for short destination, some operators still use bamboo baskets instead of returnable plastic containers. For long destination however, the fruits are packed in returnable plastic container or corrugated

fiber board; cushioning materials are placed between fruits to prevent bruising. At present there are 32 Malaysian standards for fresh and processed fruits and 23 for vegetables.

Malaysian vegetable is exported mainly to Singapore. The exports is projected to be stagnating or on the decline due to stable domestic production, captive domestic market and competition from other regional exporting countries. The produce are usually packed in bamboo baskets and transported by lorry.

The production projections of industrial commodities indicate that they will remain stable, reflecting limited land availability and labour constraints. Palm oil has higher growth rates in production and yield than rubber and cocoa. The production increase the commodities will be mainly from the smallholder sector through yield improvement and for palm oil, accompanied by increase at a marginal rate in area planted. This implies that smallholders will play an important role in the production of these commodities, and production increases will be through yield improvement. The reduction in area planted by the estate sector is due to the less attractiveness of the commodity sector vis-a-vis other sectors of the economy.

Palm oil will continue to be the major foreign exchange earner of the agricultural sector. This is based on the estimated increase in domestic production and rising world demand for fats and oils. As regards rubber and cocoa, the exports are projected to decline due to the reduction in production and rising domestic utilization. The reduction in exports of these two commodities, however, will be offset by the increase in the exports of their products.

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Table 1: Production of Agricultural Commodities ('000 tonnes), 1986 - 2000

Items	1986	1990	1995	2000	1986-90	Growth Rates (%)	
						1991-95	1996-2000
<b>Agricultural</b>							
<i>Industrial Commodities</i>							
Rubber	1539	1291	1106	1014	-2.6	-3.0	-1.7
Palm Oil	4544	6095	7814	9134	8.1	5.1	3.2
Sawlogs #1	29869	40099	32200	26922	5.8	-4.3	-3.5
Cocoa	132	247	152	155	9.9	-9.3	0.5
Pepper	15.0	31.0	17.0	16.0	8.7	-11.8	-1.1
Pinapple	144	163	178	191	2.6	1.1	1.4
Tobacco	14.0	10.2	10.3	13.0	1.6	0.3	5.6
Flowers #2	-	56424.8	112869	238903	-	4.9	16.2
<i>Food Commodities</i>							
Padi	1745	2016	2159	1940	15.5	1.4	-2.1
Fruits	887	1531	2191	3300	6.4	7.4	8.5
Vegetables	239	694	794	1050	4.0	2.7	5.8
Coconut #3	1374	1257	1536	1027	-3.1	-2.0	-2.0
Fisheries	613	1004	1306	1566	7.7	18.0	19.0
Beef	16.0	12.8	15.6	18.7	1.9	4.1	3.6
Mutton	0.6	0.8	1.1	1.3	1.9	6.5	4.2
Poultry	279	386	647	840	7.9	10.9	5.4
Pork	162	228	385	320	4.7	6.0	1.0
Eggs #3	3618	4718	3750	9150	6.8	7.1	3.4
Milk #4	27.0	34.0	33.8	37.5	7.4	3.2	2.1

Source: Sixth and Seventh Malaysia Plans

#1 cubic metres

#2 thousand stalks

#3 million units

#4 million liters

**Table 2 : Area Planted With Fruits (Hectares), 1985 - 1994**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Jack Fruit	1,865	1,419	1,516	1,487	2,130	2,268	2,417	2,152	3,026	2,360
Papaya	1,932	1,595	1,316	1,975	2,654	2,282	2,549	4,261	2,231	2,026
Pineapple	12,430	12,431	11,990	11,511	11,191	12,952	16,079	8,214	13,996	13,472
Pamelo	838	677	631	624	759	839	1,008	812	1,724	1,725
Rambutan	21,079	17,432	19,594	19,313	21,327	22,574	24,097	23,343	25,074	17,610
Watermelon	2,017	1,881	2,657	2,375	4,164	5,184	7,067	10,116	8,285	5,022
Carambola	387	581	742	973	1,105	1,328	2,299	3,411	1,934	1,465
Guava	-	1,075	1,479	2,214	2,228	2,168	2,260	2,970	2,768	2,203
Banana	23,226	21,921	27,725	27,889	25,014	30,501	35,802	35,449	39,844	38,678
Cempedak	4,595	4,458	6,320	6,726	8,231	8,721	9,465	9,757	11,122	8,101
Sarpodilla	1,081	961	1,004	1,060	1,278	1,374	1,765	1,688	1,781	1,203
Durian	31,225	36,143	42,072	46,464	54,665	56,889	62,153	61,873	82,323	106,860
Duku	3,486	3,138	3,116	3,367	3,604	5,518	5,742	5,358	11,249	15,615
Duku langsung	-	746	1,989	1,583	1,737	525	1,364	2,386	1,663	5,927
Dokong	-	37	191	186	232	383	1,086	2,417	4,146	13,796
Langsat	1,916	2,294	2,616	2,803	3,034	3,053	3,173	3,084	3,265	2,591
Mango	8,913	7,097	7,866	7,865	8,865	8,927	9,255	8,151	8,685	7,546
Mangosteen	1,878	2,022	2,186	2,159	2,504	2,523	2,895	2,894	4,234	7,717
<b>TOTAL</b>	<b>116,868</b>	<b>115,908</b>	<b>135,010</b>	<b>140,574</b>	<b>154,722</b>	<b>168,009</b>	<b>190,476</b>	<b>188,336</b>	<b>227,350</b>	<b>253,917</b>

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

**Table 3 : Production of Fruits (Metric Tonnes), 1985 - 1994**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Jack Fruit	15,946	12,132	12,962	12,714	12,475	12,239	23,042	26,393	24,170	26,870
Papaya	57,960	47,850	39,480	59,250	20,454	68,400	80,160	93,930	57,020	60,540
Pineapple	157,240	157,252	151,674	145,614	139,806	134,225	109,802	103,825	117,230	136,130
Pamelo	2,832	2,288	2,133	2,109	2,080	2,056	2,961	2,745	-	-
Rambutan	61,972	51,250	57,410	56,587	55,869	55,068	69,931	73,691	120,485	124,255
Watermelon	45,221	42,172	59,570	53,200	68,914	76,242	143,376	176,939	194,436	213,862
Carambola	8,220	11,267	13,505	19,098	31,331	40,046	50,230	48,525	39,750	44,445
Guava	-	26,875	36,975	55,350	17,970	25,200	63,425	74,250	37,050	39,850
Banana	191,847	181,067	229,009	230,363	231,725	233,095	271,597	292,808	356,650	372,700
Cempedak	49,396	48,414	68,509	73,044	77,736	82,729	92,972	104,473	56,790	64,014
Durian	194,532	225,171	262,109	289,471	309,685	353,056	388,721	426,381	273,325	284,045
Mango	30,928	24,627	27,295	27,292	27,298	27,286	35,453	40,585	49,085	54,395
Mangosteen	23,794	25,619	27,675	27,355	26,696	26,374	33,512	35,147	21,850	25,960
<b>TOTAL</b>	<b>839,888</b>	<b>855,984</b>	<b>988,306</b>	<b>1,051,447</b>	<b>1,022,039</b>	<b>1,136,016</b>	<b>1,365,182</b>	<b>1,499,692</b>	<b>1,347,841</b>	<b>1,447,066</b>

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)



Table 4 : Export of Fruits, 1985 - 1994

	1986		1987		1988		1989		1990	
	MT	RM	MT	RM	MT	RM	MT	RM	MT	RM
Watermelon	18,050	5,082,248	22,186	6,849,946	25,116	9,128,894	36,124	15,847,142	52,317	25,514,091
Papaya	-	-	-	-	539	751,843	9,775	12,389,708	13,564	12,613,235
Other Papaya	11,210	3,367,183	21,745	6,128,628	23,198	11,305,189	13,443	5,612,793	17,881	8,390,442
Guava	688	423,953	3,118	1,721,786	2,517	1,319,585	2,202	1,070,680	2,201	1,025,009
Mango	1,725	674,670	1,090	603,533	663	481,093	677	677,366	580	407,092
Mata Kucing	1,779	1,054,010	290	284,789	331	474,395	217	202,677	490	658,573
Jack Fruit	397	229,059	755	507,811	420	268,532	731	503,447	842	629,868
Pineapple	12,322	1,855,676	12,981	1,970,524	13,228	2,038,119	18,446	2,939,021	23,341	3,558,636
Sarfodilla	-	-	-	-	306	152,103	326	168,444	333	169,016
Mangosteen	364	198,266	2,101	1,268,405	483	486,438	3,032	2,520,775	1,544	1,732,483
Durian	21,756	30,985,863	26,475	34,533,536	19,889	34,688,078	36,970	42,925,246	27,331	45,683,002
Rambutan	2,067	804,128	2,315	1,272,138	782	550,146	2,903	1,709,328	2,481	1,637,329
Langsat	1,750	1,361,747	1,123	626,401	104	69,742	2,212	1,661,101	2,162	1,634,543
Banana	28,608	6,566,022	30,154	7,703,420	28,490	7,233,796	25,407	7,549,763	33,732	12,104,362
Carambola	-	-	-	-	6,779	14,949,829	11,466	20,613,093	11,324	22,489,082
Other Tropical Fruit	8,540	6,271,892	13,902	13,039,540	1,604	1,072,478	10,683	4,858,368	6,641	4,157,325
<b>TOTAL</b>	<b>109,256</b>	<b>58,874,717</b>	<b>138,235</b>	<b>76,510,457</b>	<b>124,449</b>	<b>84,970,260</b>	<b>174,614</b>	<b>121,248,952</b>	<b>196,764</b>	<b>142,404,088</b>

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	1991		1992		1993		1994		1995	
	MT	RM	MT	RM	MT	RM	MT	RM	MT	RM
Watermelon	46,119	22,361,084	74,400	29,266,670	85,859	42,698,038	176,299	53,469,276	108,522	51,363,721
Papaya	9,649	15,950,284	8,681	15,047,397	11,924	17,494,704	14,393	18,655,883	15,258	19,944,034
Other Papaya	13,124	7,898,430	13,958	8,586,485	34,660	30,965,256	20,470	12,190,755	21,012	13,377,182
Guava	1,373	749,799	1,574	902,096	3,005	1,813,916	2,526	1,507,353	2,608	1,837,615
Mango	2,340	1,512,535	2,025	1,679,986	1,549	996,656	1,144	943,807	978	817,529
Mata Kucing	950	1,448,197	987	1,895,843	1,019	1,308,105	480	886,621	356	615,190
Jack Fruit	241	337,961	479	580,942	2,567	1,764,162	3,081	2,066,880	4,633	2,268,037
Pineapple	18,871	2,903,716	19,088	3,122,787	23,464	7,304,189	21,313	7,049,822	36,269	6,567,067
Sarfodilla	52	36,741	55	35,154	489	286,716	348	234,110	293	181,839
Mangosteen	1,325	1,782,621	1,814	2,978,655	3,314	3,939,025	3,168	3,160,774	1,802	1,716,023
Durian	34,904	54,981,477	26,890	44,588,483	37,674	55,282,999	33,350	44,212,416	20,910	15,155,696
Rambutan	1,727	1,026,554	1,383	1,221,886	4,297	2,283,137	2,386	1,667,947	2,990	1,733,159
Langsat	1,091	876,496	741	797,709	578	479,966	580	442,883	6,962	1,311,013
Banana	22,622	13,301,551	18,694	8,951,608	39,214	19,656,880	46,811	27,800,037	35,676	21,651,638
Carambola	7,902	23,918,667	8,203	23,377,940	10,381	23,590,501	8,218	23,181,112	9,845	21,964,665
Other Tropical Fruit	4,729	3,943,330	2,080	1,846,881	7,857	5,216,835	4,782	3,078,760	6,305	3,095,534
<b>TOTAL</b>	<b>167,019</b>	<b>153,029,443</b>	<b>181,052</b>	<b>144,880,522</b>	<b>267,851</b>	<b>215,081,085</b>	<b>339,349</b>	<b>200,548,436</b>	<b>274,419</b>	<b>163,599,942</b>

Source: Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

Table 5 : Export of Malaysian Fruits by Destination

Destination		1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Singapore	MT	101459.89	126182.44	111621.03	148304.67	162716.97	137583.5	145634.5	214041.29	261961.1	165883.19
	RM	52523471	62202945	61385679	80944326	91338123	93905890	86914220	130799440	112799080	78246770
Hong Kong	MT	6429.96	9510.09	9767.19	15228.23	26046.27	18962.71	23186.17	26695.82	48292.07	41582.04
	RM	5355460	8985409	11855517	21787996	29730162	30778830	25201990	39669570	47950610	50015060
Asia	MT	413.40	1128.37	841.61	6310.07	4023.21	2411.41	1569.29	3915.16	3615.91	7716.92
	RM	489231	1307527	1355917	3600139	4149736	2629280	1258860	3317360	3587403	3546344
Middle East	MT	34.32	3.28	10.51	80.94	552.91	14.06	-	10.5	316.88	17550.28
	RM	5576	7177	30797	438126	352783	2000	-	9450	348120	1223090
Western Europe	MT	113.12	1326.89	1978.70	4213.67	3209.06	2208.37	2251.44	2776.61	2529.92	2971.6
	RM	383331	3714635	9895121	13186209	15567052	2502686	3202081	4176319	4198544	12047950
Australia N. Zealand	MT	2.03	7.34	160.02	85.08	34.57	-	-	-	-	-
	RM	4004	49486	72175	344038	98263	-	-	-	-	-
North America	MT	1.07	76.51	68.66	391.28	179.88	-	-	-	-	-
	RM	2379	241876	375054	947758	1154496	-	-	-	-	-
South America	MT	-	-	-	1.20	-	-	-	-	-	-
	RM	-	-	-	360	-	-	-	-	-	-
Africa	MT	-	-	-	-	2.13	-	-	-	-	-
	RM	-	-	-	-	13470	-	-	-	-	-
Russia China East Europe	MT	0.27	0.44	-	-	-	-	-	-	-	-
	RM	1382	1402	-	-	-	-	-	-	-	-
TOTAL	MT	108454.06	138235.36	124447.72	174292.52	196976.40	161359.96	172641.44	247439.38	316715.88	235704.03
	RM	58764834	76510457	84970260	120676248	142197347	130973182	116577151	177972139	168883757	145079214

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

Table 6 : Export of Malaysian Fruits by Types and Destination

TYPE OF FRUIT		DESTINATION PERFORMANCE (in RM'000)									
		1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Durian	Singapore	30829.54	34055.75	34349.39	42173.39	45158.26	54489.77	42112.26	55089.58	43750.55	15007.02
	Brunei	118.83	7071	118.23	214	166.12	57.45	10.5	50.52	411.67	80.85
	U.S.A	-	122.79	58.02	42173.09	108.65	-	-	-	-	-
	Hong Kong	34.35	35.07	2.47	0.77	15.13	9.08	0.9	16.74	19.78	1.6
Carambola	Hong Kong	-	-	4104.28	6665.92	6280.09	5667.98	6.32.78	6361.79	4012.78	3657.42
	Singapore	-	-	1046.64	1896.55	1532.16	1175.26	1008.23	1940.31	1314.63	1068.47
	Netherland	-	-	2556.79	5118.21	8074.13	10802.26	9725.27	8963.29	8650.67	9807.97
	Germany	-	-	1156.39	1714.87	1507.94	1415.45	2177.63	3261.78	3333.06	2235.75
	U.Kingdom	-	-	1243.38	1708.48	2534.87	-	-	-	-	-
	France	-	-	1156.39	922.67	343.29	-	-	-	-	-
Exotica Papaya	Hong Kong	701.69	1647.86	6521.58	11210.99	13728.72	17602.19	16494.19	19563.39	19903.48	24000.19
	Singapore	2659.35	4455.25	5396.13	5022.85	4873.66	4170.27	5149.84	9904.99	9215.09	7734.11
	U.Kingdom	0.23	4.24	42.02	540.33	100.43	-	-	-	-	-
	Netherland	-	-	-	156.4	490.61	-	-	-	-	-
	Australia	-	0.6	-	107.44	6.63	-	-	-	-	-
	Germany	0.18	7.77	-	10.65	44.03	-	-	-	-	-
	Brunei	-	-	-	-	-	-	-	107.57	125.63	135.6
Bananas	Hong Kong	1096.03	1311	689.69	206.71	262.71	358.78	198.89	23.79	1.54	9.64
	Singapore	5305.23	5940.78	6033.11	6756.45	9197.6	6871.39	7633.15	15831.51	15754.15	15161.88
	Brunei	33.58	97.97	291.1	534.61	433.61	50.53	56.59	552.74	488.34	386.29
	Japan	84.31	247.05	137.86	-	1591.5	1869.45	520.27	208.76	203.05	298.24
Mangoesteen	Hong Kong	0.24	84.21	51.51	721.52	551.17	551.3	665.13	651.1	503.37	459.43
	Singapore	172.54	995.85	217.57	1284.19	945.55	560.76	532.76	1777.29	1726.13	870
	Taiwan	-	36.71	170.6	262.51	138.28	-	-	-	-	-
	Brunei	-	1.4	3.94	0.93	2.84	0.6	-	0.1	9.6	12.05
	Thailand	-	9.52	2.99	121.26	18.89	210.96	348.86	716.78	632.63	250.02
Guava	Singapore	421.99	1686.9	1261.83	1030.77	984.91	623.88	795.95	1518.76	1389.75	1724.24
	Brunei	-	18.02	42.83	8.68	7.48	-	-	40.76	63.69	45.14
	S.Arabia	-	0.15	1.42	11.31	9.08	-	-	-	-	-
	Kuwait	-	0.11	0.39	0.18	8.82	-	-	-	-	-
	Netherland	-	3.72	5.67	5.53	6.92	-	-	-	-	-
	Hong Kong	-	-	-	-	-	14.02	27.47	-	0.08	19.24

.....Table 6: (Continued)

Watermelon	Hong Kong	1.51	45.32	315.65	2829.54	8706.91	6148.22	7489.75	12698.03	23218.09	21250.49
	Singapore	5068.44	6777.73	8760.82	12380.11	16144.64	15906.95	20198.97	27035.43	25761.34	24399.07
	Brunei	1.68	26.27	40.86	310.14	314.46	62.74	96.69	583.42	544.68	550.24
Rambutan	Singapore	796.55	1158.62	403.51	1429.15	1382.94	944.07	912.88	2174.83	1584.72	1630.99
	Taiwan	-	46.25	74.14	36.6	115.22	-	-	-	-	-
	U.Kingdom	1.38	1.66	22.92	19.6	5.3	-	-	-	-	-
	USA	-	-	-	42.29	-	-	-	-	-	-
	Brunei	1.66	4.92	9.86	26.84	47.31	-	0.59	36.58	50.56	39.48
	German.Fe	0.86	6.37	13.75	2159	1.81	-	17.37	9.02	-	0.1
Pineapple	Singapore	5305.23	1959.79	2003.17	2785.49	3519.2	2864.13	3076.21	6865.57	5892.4	4785.96
	Brunei	1.52	10.73	34.46	126.7	35.27	-	-	200.66	278.49	264.18
	Australia	-	-	-	12.79	-	-	-	-	-	-
	Hong Kong	-	-	-	-	4.14	-	-	-	-	-
	UAE	-	-	-	-	-	2	-	9.45	348.12	1223.09
Others <i>ms</i>	Hong Kong	3520.78	5825.13	164.96	141.76	162.74	427.26	325.66	354.73	291.49	617.05
	Singapore	5422.81	5172.23	1913.51	6185.66	6599.2	6299.41	5493.97	8661.17	6410.32	5865.03
	Brunei	74.79	123.42	224.49	923.97	518.93	123.87	76.49	187.09	356.663	404.404
	Thailand	56.75	164.14	13.86	653.29	165.35	253.68	148.87	632.38	422.4	1079.85
	Netherland	-	-	0.69	1.74	0.21	-	2.45	9.66	4.17	4.13
All Varieties	Singapore	50676.43	62202.95	61385.68	80944.33	91338.12	26014.56	29682.03	44737	39648.78	36681.05
	Hong Kong	5355.46	8985.41	11855.52	21788	29730.16	6575.48	7815.41	13052.76	23509.58	21867.54
	Netherland	90.29	786.85	2631.31	5425.72	8805.16	0	2.45	9.66	4.17	4.13

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

Table 7 : Market Share of Malaysian Fruits in Singapore

Type of Fruits	Average market Share (1987 - 1990)
Papaya	99.1
Watermelon	95.1
Durians	94.3
Pineapples	93.5
Bananas	91.0
Avocado, Mangoes and Guava	49.6
Other Fruits	65.3

Source: Aziz (1992)

**Table 8 : Market Potential For Selected Fruits In Western Europe  
1991-1995**

	Carambola	Rambutan	Mangoesteen	Sapodilla	Guavas
Germany	G	G	G	F	F
France	F	G	F	F	G
U.Kingdom	G	F	F	G	F
Netherlands	G	G	G	F	F
Sweden	G	F	F	F	F
Denmark	G	F	F	F	F
E - Excellent		G - Good		F - Fair	

- Source: FAMA - ITC study (1991)

Table 9. Colour index of selected Malaysian fruits

Papaya

Colour Index 1:	Fully green
Colour Index 2:	Green with tinge of yellow
Colour Index 3:	More green than yellow
Colour Index 4:	More yellow than green
Colour Index 5:	Yellow with tinge of green
Colour Index 6:	Fully yellow

Carambola

Colour Index 1:	Fully green
Colour Index 2:	less than 25% yellow
Colour Index 3:	26 - 75% yellow
Colour Index 4:	76 - 100% yellow
Colour Index 5:	Fully orange

Mangosteen

Colour Index 1:	Yellowish green with some reddish effect
Colour Index 2:	Yellowish red with patch of red around fruits
Colour Index 3:	Reddish brown in whole fruit
Colour Index 4:	Reddish purple in whole fruit
Colour Index 5:	Dark purple or blackish in whole fruit

Berangan Bananas

Colour Index 1:	Fully green
Colour Index 2:	Green with tinge of yellow
Colour Index 3:	More green than yellow
Colour Index 4:	More yellow than green
Colour Index 5:	Yellow with green at the end of fruits
Colour Index 6:	Fully yellow
Colour Index 7:	Orangish yellow
Colour Index 8:	Yellowish orange

Table 10a. Malaysian Standard on fresh and processed fruits

No.	Title of MS	MS number
1.	Malaysian grown Mandarins for fresh fruit consumption (Amd. No. 1 - 1985)	232:1974
2.	Methods of sampling fresh fruits	78:1973
3.	Recommendation for the marketing of fresh pineapple	233:1974
4.	Storage and transport of green bananas (Amd. No.1: 1985)	79:1973
5.	Recommended nomenclature for Malaysian fruits (First revision)	325:1976 :1985
6.	Fresh bananas	459:1976
7.	Fresh ground nut kernels	457:1976
8.	Fresh in-shell groundnuts	458:1975
9.	Canned pineapples (Amd. No. 1 : 1981)	302:1975
10.	Canned rambutan	304:1975
11.	Canned pineapple juice	714:1981
12.	Canned kaya	713:1981
13.	Jams, jellies and marmalades	596:1979
14.	Canned tropical fruit cocktail	812:1983
15.	Canned papaya-pineapple salad	780:1982



No.	Title of MS	MS number
16.	Canned jackfruit	884:1984
17.	Mango for fresh fruit consumption	885:1984
18.	Canned guava nectar	902:1984
19.	Canned mango nectar	901:1984
20.	Canned guava	950:1985
21.	Canned watermelon	1028:1986
22.	Fresh papaya	1040:1986
23.	Fresh pineapple	1041:1986
24.	Fresh jackfruit	1055:1986
25.	Canned passionfruit nectar	1027:1987
26.	Fresh 'Mas' bananas (Amd. No. 1:1989)	1075:1987
27.	Raw unprocessed in-shell groundnuts to be processed into Menglembu groundnuts	1111:1988
28.	Fresh starfruit Fresh carambola (First revision)	1127:1989 :1993
29.	Quick frozen mangosteen	1128:1989
30.	Fresh guava	1149:1989
31.	Fresh eksotika papaya	1145:1990
32.	Fresh tembikai wangi (muskmelon)	1325:1993

Table 10b. Malaysian Standard on fresh and processed vegetables

No.	Title of MS	MS number
1.	Recommended nomenclature for Malaysian vegetables (First revision)	546:1978 :1994
2.	Canned sweet corn (First revision)	673:1988
3.	Canned mushroom (Agaricus)	664:1980
4.	Fresh tomatoes *	893:1996
5.	Fresh chillies	894:1984
6.	Fresh long beans *	951:1996
7.	Canned processed peas	952:1985
8.	Fresh cucumbers *	956:1996
9.	Canned beans in tomato sauce	997:1986
10.	Canned long beans	998:1986
11.	Fresh sweet pepper *	1124:1996
12.	Fresh bitter gourd	1146:1989
13.	Method for sampling fresh vegetables	1187:1990
14.	Fresh sweet corn	1229:1991
15.	Fresh okra (lady's finger)	1230:1991
16.	Fresh french beans	1252:1992
17.	Fresh ginger	1306:1993
18.	Guide to prepacking of vegetable	1307:1993
19.	Fresh mustards	1323:1993
20.	Fresh kale (kailan)	1324:1993
21.	Fresh head lettuce	1361:1994
22.	Fresh spinach	1362:1994
23.	Fresh cabbage (First revision)	892:1994

\* MS implemented / used through SIRIM Certification Marking Scheme.

Table 11 : Planted Area of Vegetables (Ha), Malaysia

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Spinach	451	555	541	811	857	815	757	838	1,273	1,375
Terung	482	669	513	776	1,404	1,555	1,293	1,620	1,629	1,533
Cabbage	1,128	512	1,042	726	677	1,091	871	1,047	1,097	961
Chillies	1,354	1,500	1,394	2,137	3,449	3,055	2,928	3,385	3,592	t.d.
Sawi	1,076	958	1,249	1,805	3,139	2,466	2,287	2,323	2,651	2,766
Cucumber	883	1,249	1,178	1,847	3,262	3,654	3,457	3,916	3,894	4,449
Kale	147	265	343	332	397	392	378	507	530	322
Tomatoes	557	652	380	463	622	571	462	489	510	596
French beans	599	684	691	854	1,559	1,812	1,498	1,851	1,959	1,647
Cabbage lettuce	147	199	239	432	425	491	506	487	708	514
Long beans	967	1,640	1,677	2,617	4,331	4,659	4,517	5,472	5,317	4,867
Laxo's finger	131	747	672	1,219	1,873	1,792	1,642	2,112	1,899	1,913
Kangkong	594	447	743	710	995	925	889	1,088	1,448	1,013
Ketola	521	527	471	659	1,188	1,352	1,161	1,440	1,168	1,328
Peria	389	376	334	579	877	1,086	993	1,243	1,058	1,065
Halia	1,008	521	321	368	914	587	504	500	363	t.d.
<b>TOTAL</b>	<b>10,434</b>	<b>11,501</b>	<b>11,788</b>	<b>16,335</b>	<b>25,969</b>	<b>26,303</b>	<b>24,143</b>	<b>28,318</b>	<b>29,096</b>	<b>24,349</b>

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

Table 12 : Production of Vegetables (Metric Tonnes), Malaysia

	1988	1989	1990	1991	1992	1993	1994
Spinach	13,544	13,798	13,773	12,339	13,348	13,842	14,396
Terung	14,822	16,957	29,856	24,696	27,064	28,065	29,188
Cabbage	12,124	10,890	18,438	14,197	14,520	15,057	15,659
Chillies	12,582	18,250	19,417	21,890	23,411	22,964	t.d.
Sawi	30,210	50,537	41,675	33,757	42,207	43,769	45,520
Cucumber	28,402	62,630	70,152	103,675	78,577	81,484	84,743
Kale	5,544	6,392	6,625	6,161	6,418	6,655	6,921
Tomatoes	8,843	11,942	10,963	8,824	10,524	10,913	11,350
French beans	16,311	29,933	34,790	28,612	29,089	30,165	31,372
Cabbage lettuse	7,214	6,842	8,298	8,297	7,637	7,920	8,237
Long beans	49,985	83,155	90,163	86,275	85,950	89,130	92,695
Laxo's finger	23,283	35,962	34,406	31,362	23,787	24,667	25,654
Kangkong	11,857	16,019	15,632	14,491	15,444	16,015	16,656
Ketola	12,587	22,694	25,958	21,984	23,455	24,323	25,296
Peria	11,058	16,838	20,851	18,966	18,813	19,509	20,289
<b>TOTAL</b>	<b>258,366</b>	<b>402,839</b>	<b>440,997</b>	<b>435,526</b>	<b>420,244</b>	<b>434,478</b>	<b>427,976</b>

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

Table 13 : Export Performance of Malaysian Vegetables by Varieties

	1988		1989		1990		1991		1992		1993		1994	
	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)	Quantity (MT)	Value (RM'000)
Tomatoes	6,954	2,733	7,275	2,908	6,889	2,883	8,679	2,324	5,529	2,707	5,434	2,737	4,042	2,038
Onion	3,953	2,813	22,233	12,895	9,938	5,995	7,519	4,720	13,099	7,453	15,689	9,082	12,353	7,071
Garlic	5,432	9,069	4,668	8,262	4,392	5,449	3,008	5,422	6,622	8,265	6,359	9,952	7,455	10,279
Leek	2,168	841	2,496	1,139	2,762	1,298	1,831	888	2,265	1,347	4,494	2,732	3,299	2,391
Cauliflower	64	51	14	36	20	100	50	317	63	332	87	212	86	268
Brussel Sproutts	14	64	9	4	5	2	8	4	97	48	160	123	118	48
Round Cabbage	2,209	1,384	7,921	4,211	8,238	4,424	6,819	3,482	8,168	4,294	7,970	4,457	5,455	3,051
Other Cabbage	2,736	1,272	319	159	260	163	290	120	640	289	489	319	301	263
Chinese mustard	564	222	11,847	4,724	15,451	6,344	5,415	2,703	8,339	4,100	19,098	8,915	12,045	4,688
Kale	2,575	992	576	284	517	283	362	231	142	286	333	970	505	867
Cabbage Lettuce	1,235	650	1,584	847	1,751	498	1,116	659	976	596	1,105	635	329	107
Other Lettuce	513	245	642	289	633	308	21	15	60	74	2,741	1,291	1,764	811
Other Chicory	42	24	139	62	6	3	1	3	3	4	1	1	2	6
Carrot	2,087	646	2,348	784	2,674	935	954	359	942	370	8,205	2,679	6,560	2,155
Salad Beetrot	2,724	721	1,856	496	1,751	498	616	202	418	162	670	420	323	232
Cucumber	17,541	4,417	18,419	5,206	18,582	5,663	4,125	1,622	7,987	2,925	26,036	9,611	20,257	6,473
Peas	566	408	98	107	225	145	86	177	114	229	260	616	98	126
French Beans	414	159	5,195	1,858	3,933	1,583	169	100	136	80	3,159	1,437	1,949	802
Long Beans	637	186	9,420	2,909	8,998	3,140	665	284	2,151	895	10,974	4,548	8,026	2,981
Other Beans	355	143	515	692	112	291	156	249	123	104	100	174	65	99
Other Leguminus Veg	14,966	3,941	13,397	3,740	13,565	4,328	1,444	1,636	5,349	1,581	641	1,230	8,026	1,225
Mushroom	14	81	81	181	126	254	84	256	140	531	184	1,345	89	596
Glove Artichokes	7	3	2	1	0	0	6	4	0	0	2	2	5	2
Asparagus	114	132	336	412	347	763	6	69	6	4	52	92	24	24
Aubergines	0	0	87	72	115	126	44	9	10	10	7,253	2,643	5,241	1,970
Celery	958	509	1,092	616	1,060	621	602	342	590	327	342	207	330	196
Chillies	7,043	5,690	8,335	6,297	7,989	6,687	3,141	2,876	3,524	3,240	8,396	6,471	6,710	5,192
Capsicum	861	656	26	73	30	98	15	40	10	36	3	8	89	190
Spinash	2,446	1,520	3,320	1,969	3,589	2,333	2,338	1,732	2,940	2,099	8,997	4,971	7,377	3,446
Sweetcorn	399	191	145	117	109	149	57	49	52	35	357	371	304	396
Lady's Finger	156	47	3,322	1,081	3,358	1,154	136	42	375	153	4,357	1,868	3,671	1,473
Other Vegetables	27,244	9,556	19,618	7,800	20,860	8,960	11,826	6,111	20,965	10,265	47,165	21,520	51,669	13,957
<b>TOTAL</b>	<b>106,991</b>	<b>49,366</b>	<b>147,335</b>	<b>70,231</b>	<b>138,285</b>	<b>65,478</b>	<b>61,589</b>	<b>37,047</b>	<b>91,835</b>	<b>52,841</b>	<b>191,113</b>	<b>101,023</b>	<b>168,567</b>	<b>73,423</b>

Source : Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)

**Table 14: Summary of Principle Palm Oil Statistics: Malaysia**

Year	Area (Hectare)	Production (Tonnes)	Export (tonne)		Average Price (RM/tonne)
			Crude	Processed	
1960	54,634	91,793	97,568		628
1961	57,143	94,846	94,920		657
1962	62,079	108,171	107,386		612
1963	71,030	125,691	116,736		609
1964	83,200	122,913	125,247		639
1965	96,945	150,411	141,477		742
1966	122,703	189,687	181,282		632
1967	150,610	255,758	188,916		614
1968	190,765	282,984	285,965		440
1969	231,176	352,096	356,743		430
1970	290,967	431,069	401,930		641
1971	339,512	580,389	573,356		673
1972	401,038	718,580	696,983		482
1973	471,458	812,614	797,808		570
1974	565,766	1,045,975	901,566		1,153
1975	641,791	1,257,573	957,411	203,157	1,055
1976	714,600	1,391,965	977,424	462,660	882
1977	781,814	1,612,747	701,078	725,806	893
1978	852,979	1,785,525	574,021	941,835	1,069
1979	938,863	2,188,439	358,173	1,559,148	1,038
1980	1,023,306	2,575,865	197,659	2,072,564	919
1981	1,140,538	2,824,464	138,779	2,375,431	964
1982	1,200,104	3,514,169	78,146	2,809,207	829
1983	1,258,009	3,018,333	90,673	3,075,503	991
1984	1,349,192	3,715,739	59,341	3,126,677	1,408
1985	1,468,214	4,133,394	10,051	3,421,518	1,046
1986	1,599,311	4,543,884	117,488	4,440,572	579
1987	1,672,875	4,533,012	170,669	4,089,962	773
1988	1,805,923	5,027,496	26,639	4,320,547	1,029
1989	1,951,256	6,056,501	19,239	5,172,832	822
1990	2,029,464	6,094,622	99,479	5,842,228	701
1991	2,094,028	6,141,353	89,881	5,473,247	837
1992	2,167,396	6,373,457	71,625	5,483,488	917

Source: Department of Statistics, Malaysia  
Palm Oil Registration And Licencing Authority

**Table 15: Summary of Principle Natural Rubber Statistics**

Year	Planted Area ('000 hectare)	Production (Tonnes)	Export (tonne)		Import ('000 tonne)	Local Consumption ('000 Tonne)
			Volume (tonne)	Value (RM)		
1961	1,608.26	818,038	874,937	1,566.90	65.90	6.8
1962	1,680.37	793,583	970,905	1,476.90	68.40	7.2
1963	1,721.22	832,201	922,121	1,475.70	54.00	9.6
1964	2,003.30	870,751	928,225	1,395.80	41.20	11.6
1965	2,024.62	916,940	966,043	1,461.80	46.90	14.2
1966	2,050.84	972,945	1,013,102	1,473.90	47.70	14.5
1967	2,044.68	991,142	1,043,224	1,274.70	53.00	14.7
1968	2,022.36	1,100,382	1,171,581	1,353.20	57.30	17.4
1969	2,022.94	1,268,190	1,353,907	2,031.10	62.00	18.7
1970	2,019.46	1,269,353	1,345,299	1,723.70	41.20	20.4
1971	2,015.99	1,318,610	1,390,393	1,460.30	34.30	22.3
1972	2,000.67	1,304,363	1,365,056	1,298.30	33.80	22.7
1973	1,991.03	1,524,523	1,638,662	2,507.20	48.00	25.7
1974	1,988.95	1,524,803	1,570,188	2,887.70	39.20	28.4
1975	1,991.78	1,459,331	1,459,783	2,025.50	35.40	30.6
1976	1,980.90	1,612,481	1,620,152	3,097.80	40.20	33.5
1977	1,981.51	1,588,053	1,654,127	3,379.40	47.30	37.2
1978	1,999.17	1,582,453	1,613,991	3,601.10	49.10	38.6
1979	2,006.62	1,570,127	1,650,530	4,481.80	41.00	40.4
1980	1,999.30	1,530,000	1,525,691	4,618.00	44.30	45.4
1981	2,005.86	1,510,222	1,485,283	3,713.10	31.10	47.4
1982	1,991.59	1,494,182	1,378,167	2,655.10	24.00	59.2
1983	1,973.69	1,563,716	1,563,006	3,663.60	24.98	65.34
1984	1,967.41	1,530,583	1,590,082	3,671.50	62.98	68.82
1985	1,948.70	1,469,453	1,498,827	2,872.20	31.54	69.34
1986	1,905.60	1,538,638	1,516,874	3,182.70	30.97	70.84
1987	1,874.60	1,578,901	1,622,744	3,915.40	42.20	82.39
1988	1,867.30	1,661,551	1,610,562	5,255.90	46.72	103.43
1989	1,849.00	1,415,284	1,490,422	3,955.00	122.30	121.63
1990	1,832.90	1,291,501	1,321,653	3,028.20	136.22	182.3
1991	1,822.30	1,252,778	1,131,844	2,689.90	90.63	214.76

Source: Department of Statistics, Malaysia  
 Malaysian Rubber Research and Development Board  
 Malaysian Rubber Exchange & Licencing Board

Table 16: Summary of Principal Cocoa Statistics: Malaysia, 1972 - 93

Year	Area (hectare)				Production Value (tonnes)	Export of Cocoa Beans		Price (RM/kg)		International Price Spot Ghana ( / tonne)
	Peninsular Malaysia	Sabah	Sarawak	Total		Volume (tonnes)	Value (RM'000)	Wet Cocoa	Dry Cocoa	
										270
1972	8,984.0	5,447.0	880.0	15,311.0	5,000.0	4,084.5	6,557.6	-	-	585.0
1973	11,599.0	6,242.0	1,481.0	19,322.0	9,000.0	5,655.6	14,876.4	-	-	990.0
1974	13,634.0	8,126.0	2,313.0	24,073.0	10,000.0	9,720.3	32,955.6	-	-	585.0
1975	17,587.0	9,823.0	2,870.0	30,280.0	13,000.0	11,729.9	35,320.8	0.7	2.1	990.0
1976	20,796.0	11,673.0	3,342.0	35,811.0	15,434.0	14,751.3	63,518.8	1.3	4.1	723.0
1977	29,635.0	14,994.0	3,850.0	48,479.0	16,708.0	13,610.6	113,185.4	2.8	8.6	1,399.0
1978	34,268.0	22,097.0	4,557.0	60,922.0	17,564.0	17,625.8	130,678.3	2.1	6.6	2,944.0
1979	45,168.0	37,438.0	6,385.0	88,991.0	26,500.0	24,100.5	157,708.3	1.9	5.8	2,006.0
1980	57,345.0	57,984.0	8,526.0	123,855.0	36,500.0	30,640.4	161,860.5	1.4	4.4	1,727.0
1981	64,618.0	83,455.0	10,711.0	158,784.0	45,200.0	42,237.0	171,514.9	1.1	3.4	1,270.0
1982	82,185.0	114,474.0	12,740.0	209,399.0	66,200.0	57,614.4	198,149.8	0.9	2.9	1,125.0
1983	83,949.0	132,729.0	14,402.0	231,080.0	69,000.0	57,268.5	228,619.8	1.2	4.1	1,034.0
1984	89,163.0	159,288.0	17,059.0	265,510.0	88,000.0	66,133.0	338,065.9	1.4	4.8	1,502.0
1985	106,932.0	172,713.0	24,252.0	303,897.0	108,000.0	81,465.2	409,459.2	1.4	4.7	2,071.0
1986	105,183.0	184,477.0	31,949.0	321,609.0	137,084.0	106,083.5	496,069.9	1.2	4.2	2,030.0
1987	122,772.0	196,944.0	43,293.0	363,009.0	194,000.0	157,432.7	683,621.2	1.1	3.8	1,567.0
1988	141,750.0	204,466.0	53,675.0	399,891.0	230,000.0	189,388.6	708,281.1	0.9	3.1	1,320.0
1989	138,773.0	205,260.0	70,105.0	414,138.0	255,000.0	169,280.0	708,275.0	0.8	2.6	1,146.0
1990	137,931.0	205,978.0	60,214.0	404,123.0	247,000.0	162,618.0	448,452.0	0.7	2.5	890.0
1991	142,000.0	201,000.0	57,200.0	400,200.0	230,000.0	148,115.4	406,482.3	0.7	2.4	701.0
1992	136,500.0	195,000.0	67,200.0	398,700.0	220,000.0	125,440.0	314,539.0	0.7	2.2	684.0
1993	109,500.0	178,500.0	62,000.0	350,000.0	200,000.0	123,147.0	303,946.0	0.7	2.3	844.0

Sources: Department of Statistics, Malaysia  
Federal Agricultural Marketing Authority (FAMA)



Table 17 : Export of Cocoa Beans and Products, 1981 - 93

Year	Cocoa Beans		Cocoa butter		Cocoa powder**		Cocoa paste		Chocolates		Total Value (RM'000)
	Quantity (tonne)	Value (RM'000)	Quantity (tonne)	Value (RM'000)	Quantity (tonne)	Value (RM'000)	Quantity (tonne)	Value (RM'000)	Quantity (tonne)	Value (RM'000)	
1981	42,237	171,515	3,237	40,881	1,462	2,555	49	276	268	2,476	217,703
1982	57,614	198,150	4,218	42,758	1,469	2,238	165	261	175	1,889	245,296
1983	57,269	228,620	5,247	47,725	1,414	2,933	2,045	3,979	327	1,330	286,387
1984	66,133	338,066	8,850	99,983	2,509	9,424	2,968	11,398	368	3,696	462,567
1985	81,465	409,459	9,231	117,328	4,424	10,975	2,637	4,854	374	3,049	545,665
1986	106,083	496,070	10,273	123,990	8,331	19,752	1,009	2,176	554	4,397	646,449
1987	157,433	683,621	13,131	149,349	7,940	27,909	3,392	6,588	1,038	7,517	866,827
1988	189,387	708,275	15,578	151,428	9,786	20,445	2,529	4,594	2,106	14,885	907,091
1989	169,281	520,188	19,041	154,153	7,894	24,445	6,460	10,790	3,054	19,889	725,465
1990	162,618	448,452	29,097	241,307	10,347	24,406	9,664	16,338	4,322	25,331	755,834
1991	148,115	406,482	31,140	243,907	13,301	22,427	8,132	7,535	4,806	39,335	719,686
1992	125,440	314,539	34,274	236,589	24,542	33,244	9,480	8,205	5,462	45,042	637,619
1993	123,147	303,946	39,476	256,588	25,239	37,368	10,567	14,178	7,171	59,784	671,864

\*\* Including Cocoa powder not containing added sugar or other sweetening matter

Source: Department of Statistics, Malaysia

## Appendix I: Agricultural projects approved with tax incentives, 1986 - 1990.

Year	Activities	Hectarage
1986	Mixed fruits and vegetables	400
	Mixed farming fish, prawn, livestock, fruit and vegetable	200
	Starfruit and orchid	22
	Mango, durian	
	Mixed fruits, starfruit, guava, citrus, rambutan, durian and langsung	
	Mixed fruits, mango, durian, starfruit, petai	
	Mixed fruits, starfruit, durian, mango, banana, papaya	
	Mixed farming, fish, prawn and fruits	
1987	Canned fruits, vegetables	
	Canned fruits and vegetables juices	
	Starfruit juice	
	Mixed fruits, papaya, watermelon, starfruit, banana, guava	
	Fruit and vegetable chips	
	Mixed fruits, starfruit, guava, papaya, mango	
	Coconut cream, coconut water and fruit juice	
	UHT milk and fruit juices	
	UHT milk, fruit juices, coconut water and coconut milk	
	Papain, papaya juice and papaya jam	
1988	Papaya, mango and guava	8
	Mixed farming papaya, citrus, starfruit, vegetables and cocoa	36
	Mixed fruits, papaya and melon	52
	Banana	400
	Tropical fruit juices and related products	400
	Mixed fruits melon, papaya and banana	150
	Mixed fruit melon, banana, grapes and sweet corn	160
	Guava	
	Papaya, banana	
	Banana and livestock	
	Passion fruit juice and concentrate	
	Citrus	3
	Papaya and starfruit	120
1989	Fruit juices, concentrate and preserved fruits	
	Vacuum dried dehydrated fruits and vegetables	
	Mixed fruits, citrus and durian	20
	Fruit juices, cocktail and cordials	
	Fruit juices, canned fruits and vegetables and jam	
	Mixed farming fruits and vegetables	4
	Fruits and cocoa	36
1990	Mixed fruit banana, papaya, citrus and durian	
	Fruits and vegetables	
	Fruit juices and concentrates	
	Mixed fruits, grapes, pineapple, lychee, guava and melon	
	Fruit juices	
	Banana	30
	Mixed fruits, citrus, mango, cempedak, guava, starfruit	6
	Starfruit	400
Mangosteen and durian	40	
Mixed farming fruit, prawn and fish		

## Appendix IIa. Classification and grading for pineapple

Classification:

*Large.* Pineapple whose weight is more than 2 kg.

*Medium.* Pineapple whose weight is between 1 and 2 kg with a tolerance of + 0.2 kg.

*Small.* Pineapple whose weight is less than 1.0 kg.

Grading:

*Grade A.* Pineapple shall be the same varietal characteristics: mature, firm, well-formed, well developed eyes, free from decay, and injury caused by disease, insects, rodents, mechanical or other means.

*Grade B.* Pineapple shall be of similar varietal characteristics; mature, firm, well formed, have well developed eyes, reasonably free from decay, and damage caused by bruising, disease, insects, rodents, mechanical or other means.

*Grade C.* Pineapple shall be of similar varietal characteristics; mature, firm, and fairly well formed, have fairly well-developed eyes; reasonably free from decay, and damage caused by bruising, disease, insects, rodents, mechanical or other means. The crown shall be well attached to the fruit, not completely curved over and shall consist of not more than two fairly well-developed stems but may have any number of crown slips.

Source: SIRIM (1986)

## Appendix IIb. Classification and grading for mangoes

### Classification

Classification	Weight (g)
<i>Large</i>	Above 500
<i>Medium</i>	350 to 500
<i>Small</i>	Below 350

### Grading

Grade	Requirements	Tolerance
<i>Grade A</i>	<p>(a) Mangoes shall be of same cultivar having good shape, mature but not overripe, clean, smooth surface and well-cut stalk.</p> <p>(b) Mangoes shall be free from decay, fruit-fly, anthracnose, sunburn, sooty mould, scale, wrinkles and other damages.</p>	<p>(a) Mangoes in each lot which fail to meet the listed requirements shall be no more than 10% by count, among which the damaged ones shall not exceed 5% and those of decay, overripe and damaged by fruit-fly not exceeding 2%.</p>
<i>Grade B</i>	<p>(a) Mangoes shall be of same cultivar having fair shape, mature but not overripe, fairly clean, smooth surface and well-cut stalk.</p> <p>(b) Mangoes shall be free from decay, fruit-fly, anthracnose, sunburn, sooty mould, scale, wrinkles and other damages.</p>	<p>(a) Mangoes in each lot which fail to meet the listed requirements shall be no more than 10% by count, among which the damaged ones shall not exceed 5% and those if decay, overripe and damaged by fruit-fly not exceeding 2%.</p>
<i>Grade C</i>	<p>(a) Mangoes shall be of same cultivar having fair shape, mature but not overripe, fairly clean, smooth surface and well-cut stalk.</p> <p>(b) Mangoes shall be free from decay, fruit-fly, anthracnose, sunburn, sooty mould, scale, wrinkles and other damages.</p>	<p>(a) Mangoes in each lot which fail to meet the listed requirements shall be no more than 20% by count, among which the damaged ones shall not exceed 10% and those if decay, overripe and damaged by fruit-fly not exceeding 5%.</p>

Source: SIRIM (1984)

## Appendix IIc. Classification and grading for eksotika papaya

### Classification

Size	Weight (g)
<i>Large</i>	between 601 to 800
<i>Medium</i>	between 351 to 600
<i>Small</i>	between 250 to 350

### Grading

Grade *	Requirements	Tolerances
<i>Premium</i>	The fruit shall be uniform in size and shape, free from blemishes and reasonably from freckled fruits.	Fruits which do not meet these requirements should not exceed 10% by count.
<i>I</i>	The fruit shall be fairly uniform in size and shape and reasonably free from blemishes.	Fruits which do not meet these requirements should not exceed 10% by count.
<i>II</i>	The fruit shall be fairly uniform in size and shape and reasonably free from blemishes.	Fruits which do not meet these requirements should not exceed 20% by count.

\* The fruit is either hermaphrodite or female.

Source: SIRIM (1990)

Appendix II.d. Classification and Grading for Mas Banana

Factor	Tolerance permitted per hand or cluster	
	Grade 1	Grade 2
Blemished fruit, as % max. by number	10.0	15.0
Damaged bananas, as % max. by number	Nil	5.0
Off-size fruit, % max. by number	5.0	10.0

Classification

Size	Extra large		Large		Medium		Small	
	Length	Diameter	Length	Diameter	Length	Diameter	Length	Diameter
Acceptable level (cm)	more than 11.0	3.0 to 4.0	10.0 to 11.0	3.0 to 4.0	8.5 to 9.9	3.0 to 4.0	8.0 to 8.4	3.0 to 4.0
Acceptable level (cm)	10.0 and above	above 4.0	8.5 to 9.9	above 4.0	8.0 to 8.4	above 4.0	6.0 to 7.9	above 4.0

Source: SIRIM (1987)

Appendix IIe. Classification and grading for carambola

Classification

Size	Weight (g)
<i>Extra large</i>	> 230
<i>Large</i>	> 190 - 230
<i>Medium</i>	> 160 - 190
<i>Small</i>	130 - 160

Grading

Grades	Requirements	Tolerance
Premium	The fruit shall be clean, firm, well-formed and of uniform size. They shall be spotless and free from blemishes and discolourations.	Fruits which do not meet these requirements should not exceed 5% by count for defects but must conform to the requirements of the next lower grade.
1	The fruit shall be clean, firm, fairly well-formed and fairly uniform in size. They shall be reasonably free from discolourations and blemishes. The total surface area affected shall not exceed 5%.	Fruits which do not meet these requirements should not exceed 5% by count for defects, but must conform to the requirements of the next lower grade.
2	The fruit shall be reasonably clean, firm, fairly well-formed and fairly uniform in size. They shall be reasonably free from discolourations, and blemishes. The total surface are affected shall not exceed 10%.	The total number of fruits with 10% by count for defects is allowable in this grade.

Source: SIRIM (1986)