C. CONSUMPTION

I. Coconut Oil

1. World Consumption

According to Oil World, the level of coconut oil consumption in the world increased by 15.8%, from 2.556 million tons in 1972/73 to 2.960 million tons in 1981/82, an average annual growth rate of 1.6%.

In comparison with the average growth rate of 3.7% for the 17 major oils during the same period, the growth rate of coconut oil consumption was low. In addition, as already mentioned, there were large fluctuations in consumption, ranging from the lowest level of 2.103 million tons in 1973/74 and the peak level of 3.069 million tons in 1975/76, and the conditions of consumption during this period were highly unstable.

This instability of consumption was due to large fluctuations in production and the resultant price fluctuations, and also because although coconut oil has a unique fatty acid composition, when the price is high some quantity is replaced by other oils, for example by soybean oil in food applications and by petroleum products for industrial uses.

Appendix Table 13 and Appendix Fig. 4 show the estimated supply and utilization of coconut oil by regions, compiled from USDA (United States Department of Agriculture) data.

This Table and chart show that the volume of consumption in the Asian countries accounts for almost one half of total world consumption, and it can be noted that most of these countries are copra producing countries. Europe and North America are the traditional coconut oil consuming regions, each region holding a share of almost 20% of total consumption. Many countries in Africa and South America belong to the tropical climate zone, but the level of production in these regions is much lower than that in Asia, and consumption is also less. Oceania is a copra producing region, and with the exception of Australia, consumption is very low, with most of the coconut oil produced being exported.

A study of the changes in consumption by region shows that the regions with a higher level of consumption are more affected by world changes in production (in particular, production in Asia), as

shown in Appendix Table 14. It can also be noted that within the Asian region, the smaller the production, the smaller the consumption. About 80% of the consumption in this region is shared by the 3 main copra producing countries, Indonesia, India and the Philippines, and fluctuations in production in these countries are thought to be adjusted to a large extent by the level of domestic consumption. In Europe and North America as well, although not as much as in the case of Asia, consumption somehow moves in step with the fluctuations in world production. However, in these consuming countries, especially in the Federal Republic of Germany and the Netherlands, the level of consumption also moves according to the price in comparison with soybean oil and petrochemical products, and to the degree to which it is technically possible to make it substitutable for other oils.

When there is a shortage of coconut oil, the price naturally becomes high, and at such times the users seek substitute oils according to the suitability and price of the various oils available.

Which substitute oil is used depends on the application, but for industrial use, where the physical and chemical characteristics such as the structure and properties of the oil are important, the petrochemical products are mainly used. The petrochemical products are suitable as substitute materials especially in the production of surface active agents and higher alcohols, and many end-users of coconut oil in the developed countries have switched to petroleum products, whose supply is more stable, for the main material. There are also some manufacturers who have a system permitting the selective use of the various oils depending on their prices.

Recently, Indonesia has sometimes been compelled to import copra and coconut oil when domestic demand has exceeded domestic production, and this is one of the factors which have led to increases in the international price of coconut oil. However, the reliance on imports is not a good policy for Indonesia from the viewpoint of the country's international balance of payments, and the Government is conducting a campaign propagating the use of palm kernel oil and palm oil among the population, since Indonesia possesses an exportable surplus in both of these oils, although their taste is different to that of coconut oil. However, in the copra producing and consuming countries, coconut oil is often used in food, and especially in Indonesia where it is deeply rooted in the traditional eating habits of the people, it is difficult to induce the population to relinquish the use of coconut oil.

2. Outline of the Main Consuming Countries

A study of the USDA data on consumption in the main consuming countries shows that there are 14 countries which consume more than 50 million tons a year. Of these major consuming countries, 6 countries, including the Philippines, are copra producing countries and 8, including the United States, do not produce copra.

Since there are no FAO statistics showing the consumption of copra and coconut oil on an annual basis for the various consuming countries, the levels of apparent consumption were calculated from the volumes of production, imports and exports. At the end of this section, the apparent consumption in the main consuming countries is shown. It should be noted that because the stocks held by these countries have not been taken into consideration, some countries show a minus figure for consumption. With regard to the uses of coconut oil, the FAO's Food Balance Sheet shows the three-year averages for the periods of 1972-1974 and 1975-1977, and these data were used in analyzing the usage of this oil.

2.1 Copra Producing and Consuming Countries

2.1.1 Indonesia

According to the USDA data, Indonesia has the highest level of consumption among the copra producing/consuming countries, with consumption in this country tripling over the past 17 years, from 247,000 tons in 1965 to 745,000 tons in 1981. Over the past 5 years, Indonesia has accounted for about 25% of total world consumption. Domestically, coconut oil holds a share of about 90% of total vegetable oil consumption, and almost 40% of the coconut produced is directly consumed as food and the remaining 60% is used for copra production. All of the copra produced, except the quantity exported, is utilized for the extraction of oil. Until the 1960s, the oil mills were all located in Java, with both the copra produced on the island and that produced in South Sulawesi and shipped to Java being processed by these mills for the extraction of its oil. In the 1970s, foreign-owned oil mills were constructed in South Sulawesi and the demand for copra increased, and the oil mills in Java were confronted with difficulties in securing supplies from Sulawesi. Consequently, many factories had to use other oilseeds such as soybean or peanut for their oil extraction operations, while other companies had to close their factories. It is reported that the mills in South Sulawesi are currently also facing difficulty in securing the material.

According to the FAO Food Balance Sheet, 14% of the coconut

oil consumed in the country was used for the non-food industries such as soap manufacturing in 1972-1974, with the balance being used for food. In 1975-1977, the entire amount was used for food, and this being the case, it is considered that the users in the non-food industries used a substitute oil such as palm kernel oil.

2.1.2 India

Among copra producing countries, India is the second-largest consuming country after Indonesia. The coconut oil consumption in this country increased from 198,000 tons in 1965 to 287,000 tons in 1981, an average annual growth rate of 2.3% (USDA data). India is basically self-sufficient in this commodity, but when the production has decreased, copra has been imported. In 1981, India imported 75,000 tons of coconut oil (USDA data), but the coconut producers initiated a movement opposing this practice, and in July the same year a steep import duty was imposed on the imported oil. In the years from 1972 to 1977, a little less than 20% of coconut oil consumption was accounted for by the non-food industries, while slightly more than 80% was used for food (FAO data).

2.1.3 Philippines

According to the USDA data, the consumption of coconut oil in the Philippines, the largest producing country, increased from 162,000 tons in 1965 to 200,000 tons in 1981, at an average annual growth rate of 1.3%. In the Philippines, as in Indonesia, coconut oil holds a large share of vegetable oil consumption, standing at 97% in 1972-1974 and 91% in 1975-1977 (FAO data). The reason for the decreased share is that soybean oil, corn oil and palm oil entered the edible oil market.

In 1972-1977, about 70% of the coconut oil consumed was used for food, with the balance being used in the non-food industries (FAO data). The consumption of coconut oil in the industrial sector was for the manufacture of soap and detergents and for processing into higher alcohols and Cochin oil.

The Government of the Philippines has been carrying out a policy of increasing the value-added factor since the early 1970s, and has guided the exporters and oil extraction industry toward exporting the coconut oil instead of the copra. As a result, as described in the section on exports, the share held by the Philippines in the international copra market fell from 60% (500,000 ton level) around 1976 to 27% (110,000 ton level) in 1981. This country has the aim of establishing the coco-chemical industry for higher processing of its coconut oil.

The coco-chemical industry in the Philippines presently consists of three companies; one producing higher alcohols and also plasticizers, and two producing higher alcohols, methyl esters, fatty acids and glycerin. In addition, a joint enterprise between a West German company and a Philippine enterprise operating under government policy named United Coconut oil Mills, Inc., was established in 1982, and this joint enterprise is now constructing a production plant scheduled to be completed in three years' time for the manufacture of higher alcohols, fatty acids and glycerin.

Coconut oil consumption in the coco-chemical field is less than 100,000 tons in the existing three facilities, but in view of the projected expansion of these facilities and the new enterprise mentioned above, the material consumption in 1985 is expected to reach 150,000 tons. Some developed countries express a degree of anxiety, in connection with the coconut oil export policy of the Philippines, over the development of the coco-chemical industry as a national policy, since the country has only a small domestic market for coco-chemical products and must export most of the products. However according to the plan of the new factory scheduled to be completed in 1985, 30,000 metric tons of higher alcohol will be used for domestic consumption as a material for shampoos and detergents. Until recently, the local corporations of large U.S. and West German enterprises were importing beef tallow with foreign currency earned by exporting coconut oil and were producing soaps and detergents, but the export of coconut oil by these corporations has been made impossible by the coconut oil export controls [1] enacted in September 1982.

In addition, the Philippines has established a policy for the promotion of the use of coconut oil as a substitute for diesel fuel, and research had been conducted in this area since the late 1970s. The surplus coconut oil created by the export controls is bought up by the Philippine National Oil Corporation (PNOC), which is implementing the fuel substitution policy on behalf of the Government.

Actual experience has been gained in the use of coconut oil as a fuel, and in 1981, 45,000 metric tons of coconut oil were mixed with diesel oil and used for power generation and as a fuel for vessels. A plan has been made to include a 3-5%

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1) The export of copra on the basis of a new contract is banned for oil extraction companies having a level of coconut oil exports of less than 40,000 tons per annum and an operating rate of less than 65% on the average of the actual results over the past two years. This means that in fact only the United Coconut Oil Mills, Inc. and Interco Manufacturing Corp. can export.

content of coconut oil in the fuel used for the public utility vehicles remodeled from jeeps ("Jeepneys"), and from September 1982, part of the plan has been put into effect, however, this has not been successful. This coconut oil is mainly sold by United Coconut Oil Mills, Inc. to PNOC.

According to research carried out in this country, a mixture containing up to 30% coconut oil with the diesel oil has no adverse effect on the engine, and the current plan is to use 150,000 tons for mixing with fuel in 1983, 250,000 tons in 1984 and 350,000 tons in 1985.

Although at present it is economically advantageous for the Philippines to export coconut oil and import petroleum, the Government appears to be doing its best to realize the use of coconut oil as a substitute for diesel fuel, partly because of the present foreign currency situation and partly because the national plan to use alcohol produced from sugar cane as a gasoline substitute has not been so successful.

On the other hand, the following problems are pointed out:

a. The price of coconut oil bought by PNOC from United Coconut Oil Mills is lower (although only slightly so) than the export price as of September 1982, and a problem lies in whether the future price can remain at a level satisfactory to the private oil extraction companies which must sell the coconut oil to PNOC;

b. There are technical problems relating to diesel oil substitution which must be resolved.

The success or failure of the diesel oil substitution plan as yet cannot be predicted, but it is certain that the level of coconut oil exports will be reduced by the promotion of the plan. If the plan proceeds as scheduled, the export of coconut oil, which is said to have exceeded 1 million tons in 1981 as it did in 1978, will drop to the 0.7 million ton level by 1985.

If a mixture containing 30% coconut oil is realized, the export capacity of this commodity will be further reduced, in view of the amount of diesel oil now being consumed (2.4 million tons in 1981).

2.1.4 Other countries

Mexico has had a consumption level of 70,000 to 100,000 tons per annum for the past 15 years (USDA data), and although

the fluctuations from year to year are large, the average level of consumption is perhaps a little more than 80,000 tons. According to FAO data, in 1972-1974 slightly more than 40% of this amount was used for the non-food industries, mostly for soap production, with almost 60% being used for food. In 1975-1977, however, almost 90% was used for food with the balance being used in the non-food sector. Over the past 15 years almost no export or import of coconut oil has taken place; that is, production has been equal to consumption.

Sri Lanka has consumed 50,000 to 60,000 tons per annum in the same 15-year period. Since it is a coconut oil exporting country, demand has always been met by the supply of domestic oil. Most of the consumption is for food, and 20% of this is consumed in the processed form.

The level of consumption in Malaysia has been declining, from 87,000 tons in 1965 to 50,000 tons in 1981, with the difference being taken up by palm kernel oil and palm oil.

2.2 Countries without Copra Production

2.2.1 Copra extraction

All of the major consuming countries which have no domestic production of copra are developed countries. In these countries, the domestic demand for coconut oil has chiefly been met through the extraction of the oil from imported copra. In the 1970s, as the oil extraction in the copra producing countries increased, with the accompanying decrease in copra exports, the extraction in the copra-importing countries declined. Some of these countries stopped the extraction of oil, for example the United States in 1974. Especially in the late 1970s when the Philippines enforced export controls on copra, the extraction in the non-copra-producing countries decreased remarkably.

Recently, only about 300,000 tons are being processed in the EC countries and Japan. The supply of copra to these countries is mainly from the South Pacific countries including Papua New Guinea. More than half of the copra produced in these countries is produced by the farmers, often harvested by the natural collection system. Consequently, when the international price is low the supply becomes unstable. In particular, with the recently low level of the international price, exports from the South Pacific Ocean region have slumped and there is a strong movement toward calling on the Philippines and other countries to provide a greater supply of copra.

Exports of copra from the Philippines temporarily increased in 1982, reaching 184,000 tons in January-October, 2.8 times the level in the corresponding period of the previous year.

Appendix Table 15 shows the recent copra crushing levels of the non-copra-producing countries, and it can be seen that the total quantity of oil extracted decreased sharply to one-third the previous level; i.e., from the one million ton level in 1976 to the current level of around 300,000 tons.

The oil manufacturing industries in some copra-producing countries tend to cover the shortage of domestic copra by using palm kernel, as in the case of Malaysia and Indonesia. However, in the consuming countries which are not producers of copra, the crushing of palm kernel is also steadily declining, as shown in Appendix Table 16. This has accompanied the increased extraction of this oil in the copra-producing countries.

2.2.2 Coconut oil consumption by countries

Among the group of non-copra-producing countries, the consumption of coconut oil is by far the largest in the United States. The consumption in this country remained at a steady level of about 370,000 tons in the latter half of the 1960s, and increased from the early 1970s onward, following a pattern of repeated fluctuations, and reaching 536,000 tons in 1981 (USDA data). The structure of coconut oil consumption in the United States is reportedly not subject to much change, and the share held by coconut oil consumption of overall vegetable oil consumption stood at 6% in both the 1972-1974 and 1975-1977 periods (FAO data). Even so, the level of consumption decreased when the international price was high and increased when the price fell. As described below, increases or decreases in consumption are adjusted in the food sector, and the demand in the industrial sector is said to be strong even when the price rises. According to the FAO data, the ratio of the non-food to food consumption levels was 50:50 in 1972-1974, but changed to 60:40 in 1975-1977. Recently, due to the reduced price of soybean oil and the export offensives of palm oil and palm kernel oil in other countries, the demand for coconut oil in the food sector has been decreasing.

In the United States, a relatively large amount of coconut oil is used for shortening, although considerable fluctuations are seen according to the price level. The use ratio of coconut oil as one of the oil materials for shortening was 1.2% in 1970, representing the lowest level (20,400 tons), compared to the peak level in 1976 where the use ratio stood at 3.4% (58,000 tons). In this connection, the use ratio of soybean oil, which

is more stable in supply and price than coconut oil, increased from 60.9% (share of soybean oil in the shortening material oils; 989,700 tons) in 1970 to 63.3% (1,206,000 tons) in 1980. Palm oil consumption has been continuously and gradually decreasing from its peak level in 1975, and cottonseed oil is also on a declining trend. These oils showing a decreasing tendency have problems either in their price or in their stability of supply.

The use ratio of coconut oil for soap, the most important area of consumption in the non-food sector, was 19.5% (share of coconut oil in the material oils for soap, 73,900 tons in terms of volume), the lowest level, in 1970 and 23.8% (82,100 tons) at its peak in 1973. This change in the use ratio does not correspond with the change seen in the case of shortening, and the reason for this seems to be that in the manufacture of soap it is difficult for manufactures to change the mixing ratio of coconut oil and beef tallow beyond a certain limit. Beef tallow holds a stable share of 77-78% among the material oils for soap.

Coconut oil consumption in the Federal Republic of Germany has fluctuated greatly from year to year, between 107,000 tons in 1974, the lowest level over the past 15 years, when the price of coconut oil increased, and the peak level of 238,000 tons in 1976, when the coconut oil price decreased (USDA data). That is, the level of consumption is inversely proportional to the price fluctuations, and when the price of coconut oil increased, the use of coconut oil in the food sector appears to have been replaced by the use of other oils.

Coconut oil consumption in the USSR is not large in volume. According to the USDA data, it increased sharply from 15,000 tons in 1965 to 93,000 tons in 1981, and it is expected that consumption will reach 100,000 tons in 1982. The amount consumed in the period from 1972 to 1977 was entirely for the non-food industry (FAO data). It is considered that the increase in consumption was supported by a policy of using the cheap oil produced in the tropics by making improvements in processing technology, but to what extent the consumption of coconut oil will increase in the oil processing industry, which has been accustomed to use sunflower seed oil and cottonseed oil, will depend on the foreign currency situation and the production of domestic oils.

The level of consumption in Japan increased from the latter half of the 1960s into the 1970s, but in the latter half of the 1970s it did not show any clear increase, and recently it has proceeded at the level of about 80,000 tons (USDA data). On the other hand, imports of the coco-chemical products such as higher alcohols from the Philippines reached as much as 27,000 tons in

1981, and if this fact is taken into consideration, it can be said that in substance the consumption of coconut oil is increasing.

About 70% of the coconut oil consumed in Japan is used in the non-food sector and the remaining approximately 30% is used as a material in the food industry, e.g., for shortening. While the demand in the non-food sector is stable against the price fluctuations. In the food sector coconut oil is in a competitive (substitutive) relationship with most of the edible oils such as soybean oil and palm oil. Therefore, depending on the price situation in comparison with other oils, the demand for coconut oil fluctuates greatly in this sector.

In Europe, France, the United Kingdom, the Netherlands and Italy are large consuming countries, although not comparable in scale with the Federal Republic of Germany, each consuming about 50,000 tons. Generally speaking, these European countries show a strong reaction to price fluctuations, but the overall consumption in Western Europe including the Federal Republic of Germany is very large, and unless some extraordinary circumstances occur, this region, together with the United States, will continue to be the principal market for coconut oil in the future (Appendix Tables 17 and 18).

II. Palm Kernel Oil

According to USDA data, the world consumption of palm kernel oil stood at a level of about 500,000 tons from the latter part of the 1970s, and has shown an increasing trend over the past 5 years.

The major consuming countries of palm kernel oil are the developed countries in Europe, such as the United Kingdom and the Netherlands, and the United States, with palm kernel oil having been introduced into these traditional coconut oil markets as a substitute oil. In the European market, palm kernel oil is slightly higher in price than coconut oil, but due to its stability of supply, the level of consumption is gradually increasing.

According to USDA data, the levels of consumption in the Federal Republic of Germany, France and the Netherlands are still small in terms of absolute quantity, although the recent increases shown in these countries are remarkable (Appendix Table 19).

III. Babassu Kernel Oil

Most of the babassu kernel oil produced in Brazil is utilized for domestic consumption. It is chiefly used for food after refining, and also as a material in the production of soap, cosmetics and candles. From the production statistics of the Instituto Brasileiro de Geografia e Estatistica (IBGE) and the export statistics of Carteira do Comercio Exterior (CACEX), the domestic consumption of babassu oil was calculated as follows.

Table C-1 Domestic Oil Consumption in Brazil

(MT)

	Production (1)	Exports (2)	Apparent consumption (1) - (2)
1970	104,920	14,419	90,501
1971	112,141	1,450	110,691
1972	115,118	2,073	113,045
1973	123,074	1,470	121,604
1974	128,816	40,282	88,534
1975	123,379	950	122,429
1976	131,037	369	130,668
1977	137,318	4,446	132,872
1978	135,919	9,218	126,701
1979	145,530	20,428	125,102
1980	145,550	2,577	142,973

Note : Figures for production were obtained by multiplying the kernel production data of IBGE by the oil extraction ratio value of 58%.

Source: IBGE & CACEX

The levels of apparent consumption shown above almost all fall between 90,000 and 130,000 metric tons, and the trend over the past 10 years has been one of considerable increase. Among the vegetable oils consumed in Brazil during the period 1972-1977, babassu kernel oil ranked third after soybean oil (52-75% of the total vegetable oil consumption) and cottonseed oil (9-20%), and accounted for 10-13% of the total consumption of vegetable oils in those years.[1)]

1) In the FAO statistics, babassu kernel in Brazil is treated as palm kernel, and more than 99% of the values given for palm kernel oil in the Food Balance Sheet can be regarded as being those of babassu kernel oil.

The large year-to-year fluctuations in the domestic consumption of babassu kernel oil as calculated above were due to irregular exports, which reached 40,000 tons at their peak level in 1974, when the international price of coconut oil soared. Consequently, domestic consumption stood at only 89,000 tons that year, a decrease of a little more than 30,000 tons over the level in the preceding year. In 1974, 6,000 tons of coconut oil were imported, probably for use as a substitute oil.

Babassu kernel oil is said to be the best quality material for the manufacture of soap and cosmetics, and demand is considered to be very strong, unless a supply of other good substitute oils is found. In view of the population increase and improved living standards, demand is expected to show a continuing trend to increase.

D. TRADE

I. Copra and Coconut Oil

It can be safely said that almost all of the copra produced in the world is used for the production of coconut oil. Singapore is conducting entrepot trade where part of the imported copra is crushed within the country, and the surplus copra and coconut oil exceeding the quantity required for domestic consumption are exported. The Netherlands is also crushing imported copra and additionally re-exporting some quantity. Many importing countries utilize the imported copra for oil extraction within their own countries.

1. Copra Trade

1.1 Exports

The world copra trade is steadily declining every year. According to Oil World, the level of exports decreased by one half from the annual average of 980,000 tons in the three years from 1972 to 1974 to an annual average of 444,000 tons in 1979-1981. The ratio of exports to production of copra was 24.6% in 1972-1974 but decreased to 9% in 1979-1981, and this decline can mainly be attributed to a decrease in the quantities exported from the producing countries. This points to the increased level of oil extraction in the copra producing countries, a phenomenon which gained momentum in 1977.

If exports are examined by countries, the Philippines is by far the largest exporter, and has remained in the top position as of 1981. The share held by the Philippines of world exports was maintained at 60-70% until the mid-1970s, except in years when the level of production decreased due to unusual weather conditions. However, exports showed a considerable decline from the late 1970s, specifically in 1977 when the Philippines' oil extraction capacity was expanded, as a result of the policy adopted by the Government to this effect to realize a higher added value for the product, and its share fell to the 20% level. Since an export ban on copra has been in effect since September 1982, the second-largest exporter, Papua New Guinea, will take the top position in the near future. Exports of copra from the Philippines have shown larger fluctuations than the year-to-year fluctuations in copra production. There is a more than threefold difference between the level of exports in the peak year of 1972, at 968,000 tons, and the

level in 1974 of 310,000 tons (Oil World). This was because the level of copra production decreased greatly in 1974 and the export capacity decreased. The reason for the volume of coconut oil exported in the same year exceeding that in the preceding year was that although copra production decreased, a sufficient amount of copra was supplied to the domestic processors and consequently the level of exports of the oil was not affected.

The destinations for the copra from the Philippines in 1980 and 1981 are as follows, with slightly more than 90% of the total amount having been exported to Europe.

Table D-1 Destinations of Copra from the Philippines

(MT)

	1980	1981
Europe	123,258	106,385
USSR	116,560	99,640
Japan	5,092	5,250
Taiwan	-	500
Others	-	937
Total	1,606	58

Source: United Coconut Association of the Philippines

The quantity of copra exported from Papua New Guinea is about 90,000 tons per annum, and exports have not shown a large fluctuation because production is stable without the unusual weather conditions which occur in the Philippines. The factor most affecting the level of exports from this country is the price, and although the Copra Marketing Board (CMB), a government agency, operates the Copra Stabilization Fund and supports the producer price when the international price decreases, the production and shipment of copra decrease at the time of an extremely low price. This fund has been maintained by collecting a levy at a certain rate from the producers when the international price is high, i.e., when the buying price of the sole export agent CMB is higher than 185 kina.[1)] Since the recent international price has been low, the maintenance of this fund is endangered, and it is likely that the levels of production and exports will decrease.

Indonesia, which was the largest exporter next to the Philip-

1) As of December 1982, US$ 1.00 = 0.76 kina

pines in the 1960s, showed a sharp decrease in exports in the 1970s, and according to the FAO data, it became an importer (3,690 tons imported) in this period. Subsequently, 1979 saw neither exports nor imports recorded, and in 1980, this country recommenced exports, at a level of 35,000 tons. The following table (Table D-2) shows the supply and demand of copra in Indonesia for the years 1970 to 1980. There are some discrepancies between the export figures in this table and those in the Appendix Table 20 (FAO Trade Yearbook), but they are not substantial. The production figures given in the Indonesian data are higher than those in the FAO statistics (Appendix Fig. 5 and Appendix Tables 20 and 21).

Table D-2 Copra Production and Trade in Indonesia, 1970 - 1980

(1,000 MT)

	Supply			Demand			
	Copra production	Copra imports	Total	Copra exports	Copra extraction	Other*	Total
1970	1,202.9		1,202.9	185.1	641.9	375.5	1,017.8
1973	1,279.8		1,279.8	44.6	732.8	502.4	1,235.2
1974	1,343.2		1,343.2	-	779.7	563.5	1,343.2
1975	1,377.8		1,377.8	33.0	913.9	430.9	1,344.8
1976	1,534.6		1,534.6	3.9	1,212.2	318.5	1,530.7
1977	1,566.5	5.7	1,572.2	0.2	1,036.1	535.9	1,572.0
1978	1,578.2	3.7	1,581.9	-	1,033.1	548.8	1,581.9
1979	1,512.3	-	1,512.3	-	977.2	535.1	1,512.3
1980	1,600	-	1,600	35.8	1,217	347.2	1,564.2

* "Other" includes fresh nuts.

Source: Directorate General of Estates, Central Bureau of Statistics

1.2 Imports

World imports of copra are naturally correspond to the movements of the exports. The largest importer over the past 15 years has been the Federal Republic of Germany, followed by the Netherlands and Japan, and these three main importers each had an import level of 100,000 tons prior to 1977, the year in which the largest exporter, the Philippines, placed controls on its exports. These main importing countries have no domestic production of copra and are importing the copra in order to extract oil to meet domestic demand, for coconut oil, with the exception of the case of the Netherlands, which re-export the oil.

Table D-3 Copra Exports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
Philippines	380	127	28.6	2,006	669	68.3
Papua New Guinea	282	94	21.2	265	88	9.0
Vanuatu	104	35	7.9	n.a.	n.a.	n.a.
Malaysia	116	39	8.8	62	21	2.1
Solomon Is.	97	32	7.2	58	19	1.9
Singapore	78	26	5.9	n.a.	n.a.	n.a.
Mozambique	38	13	3.0	134	45	4.6
Others	240	80	18.0	415	138	14.1
World	1,332	444	100.0	2,940	980	100.0

Note : n.a. not available

Source: Oil World

As mentioned above, the imposition of copra export controls by the Philippines directly affected the level of imports of the main importing countries from 1977 onwards, and in 1980 their imports dropped to the level of 50,000 to 60,000 tons for each country. The shortage in the supply of coconut oil has been met by increasing coconut oil imports in the case of the Federal Republic of Germany, whereas in the Netherlands, no increase of coconut oil imports is seen but rather a decrease in the amount of coconut oil re-exported has occurred. In Japan, imports of coconut oil increased but not sufficiently to cover the decreased level of oil extraction. Consequently, the users in Japan have sought other oils as substitutes because of the high price and unstable supply of coconut oil. Singapore has almost no production of copra on a commercial scale, and conducts transit trade on imported copra or crushes the copra within the country and exports the oil. Therefore, Singapore shows sharp reactions to movements in the price.

India appears to have a stable import demand of 20,000 to 30,000 tons per annum to fill the gap between the domestic production of copra and consumption, although actual importation is conducted taking into consideration the international price and the foreign currency situation (Appendix Fig. 6 and Appendix Tables 22 and 23).

Table D-4 Copra Imports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
Germany, FR	172	57	12.8	790	263	22.8
Japan	195	65	14.5	344	115	10.0
Netherlands	107	36	8.1	300	100	8.7
France	125	42	9.4	146	49	4.2
Singapore	122	41	9.2	62	21	1.8
Sweden	66	22	4.9	122	41	3.6
Portugal	70	23	5.1	42	14	1.2
Malaysia	63	21	4.7	n.a.	n.a.	n.a.
Others	421	140	31.3	1,140	380	32.9
World	1,341	447	100.0	3,463	1,154	100.0

Note : n.a. not available

Source: Oil World

2. Coconut Oil Trade

While the trade in copra is decreasing, world trade in coconut oil is increasing every year as the decreased amount of copra traded is exported or imported in the form of coconut oil.

2.1 Exports

According to the Oil World data, the level of coconut oil exports almost doubled, from 609,000 tons in 1972-1974 (3-year average) to 1,230,000 tons in 1979-1981. The reason for this sharp increase is that the coconut oil produced in the Philippines increased in competitiveness, pushing the world exports sharply upwards from 783,000 tons in 1975 to 1,359,000 tons in 1976. Since then, exports have maintained a level of between 1,100,000 and 1,400,000 tons.

By countries, the Philippines is by the largest exporter and according to the Oil World data, exports from this country have accounted for about 75% of world exports in the past 15 years. Table D-5 shows the export destinations from the Philippines in 1980 and 1981. The United States and Europe are the largest export markets for the Philippines.

Table D-5 Export Destinations for Coconut Oil from the Philippines

(MT)

	1980	1981
USA	368,409	367,528
Europe	365,123	461,212
USSR	38,850	52,240
China	28,335	24,892
Japan	32,877	37,121
Others	30,412	103,633
Total	914,006	1,046,626

Source: United Coconut Association of the Philippines

After the Philippines, there are other exporting countries such as Malaysia, Singapore and Papua New Guinea, but the level of exports from any of these countries is less than one-tenth of the quantity exported from the Philippines, and it can be said that any changes in the quantity exported from these countries will not have a significant effect on the international market (Appendix Fig. 7 and Appendix Tables 24 and 25).

Table D-6 Coconut Oil Exports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
Philippines	2,756	919	74.7	1,331	444	72.9
Malaysia	190	63	5.1	118	39	6.4
Singapore	137	46	3.7	n.a.	n.a.	n.a.
Papua New Guinea	90	30	2.4	81	27	4.4
Others	516	172	14.0	245	82	13.6
World	3,689	1,230	100.0	1,828	609	100.0

Note : n.a. not available

Source: Oil World

2.2 Imports

Most of the main importing countries of coconut oil are developed countries.

The United States is the largest importer, and according to Oil World, its level of imports has consistently accounted for about 40% of total world imports over the past 5 years. The demand for coconut oil in this country is mainly based on the industrial sector, and substitutability is low. The level of imports is in the range of 400,000 to 500,000 tons, although this level usually decreases when the international price is high.

In the Federal Republic of Germany most of the domestic demand for coconut oil was met through the crushing of copra until the first half of the 1970s, but since the latter half of the 1970s copra extraction and the importation of coconut oil have been conducted in parallel. The weight varies according to the various factors involved, e.g., the extraction margin and the availability of copra. However, as the extraction of the oil increases in the copra producing countries, the import of coconut oil is increasing.

In both the Netherlands and Japan, as in the case of the Federal Republic of Germany, the domestic demand for coconut oil was met through the crushing of copra in the 1960s, but in the 1970s, imports of coconut oil started to increase. In the Netherlands the quantity of oil imported accounted for more than half of the total supply of oil in the early 1970s, while in Japan, the quantity of oil extracted and the volume imported were virtually on a par with each other in the 1980s.

This change in the coconut oil supply structure, i.e., shift from copra import to oil import, began in the United States, and followed by the Netherlands, the Federal Republic of Germany and Japan, and a similar situation also took place in the United Kingdom, France, and Italy.

The principal cause of the change from the extraction of oil from copra to the importation of coconut oil was the increased extraction capacity of the copra producing countries. The increase in the extraction capacity of the Philippines is especially remarkable, and this has been assisted by the policy of vertical integration in the coconut industry carried out by the Government (Appendix Fig. 8 and Appendix Tables 26 and 27).

Table D-7 Coconut Oil Imports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
USA	1,371	457	36.2	881	294	39.6
Germany, FR	502	167	13.2	181	60	8.1
Netherlands	201	67	5.3	131	44	5.9
UK	148	49	3.9	132	44	5.9
USSR	194	65	5.1	22	7	0.9
France	171	57	4.5	104	35	4.7
Others	1,200	400	31.7	780	260	35.0
World	3,789	1,263	100.0	2,230	743	100.0

Source: Oil World

II. Palm Kernel and Palm Kernel Oil

A large quantity of palm kernel is exported from Africa, especially Nigeria, whose exports held a share of 45% of world exports in 1979. This rose to more than 60% in 1966, but subsequently has been gradually decreasing due to declining production of the oil palm in that country and the development of a domestic palm kernel extraction industry. In Southeast Asia, Indonesia is exporting more than Malaysia even though the latter has a larger production of palm kernel, but exports from Indonesia are also declining because of the development of the local palm kernel oil extraction industry.

At present, the pattern of carrying out extraction within the producing countries and exporting the palm kernel oil is becoming more widespread, and in terms of world exports, the export ratio of palm kernel (oil equivalent basis) to palm kernel oil changed from 5:2 in 1966 to 1:5 in 1979. In Malaysia, which has been in the top position in the world in the production of palm kernel since 1977, not only almost the entire amount of palm kernel production is crushed into oil within the country, but also palm kernel is imported, with the level of imports in 1981 being 40,000 tons. In any case, a large increase in the export of palm kernel cannot be expected in the future.

With regard to imports of palm kernel, the United Kingdom, the Netherlands, Denmark and the Federal Republic of Germany, etc. in the EC shared 76% of total world imports in 1979.

Malaysia is by far the largest exporter of palm kernel oil, and its level of exports multiplied by a factor of nearly 100, from 2,268 tons in 1970 to 198,500 tons in 1979, and its share of world total exports reached aobut 60%. In the same year, Nigeria exported 51,400 tons, a share of 15%, mostly to Europe, especially the EC countries. The quantity of palm kernel oil imported into Europe has increased every year, and total imports in 1980 into this region reached 235,000 tons, 60% of total world exports of palm kernel oil. If the 139,000 tons of palm kernel imported (about 65,000 tons oil equivalent) is included, the total quantity imported by Europe comes to 300,000 tons, 64% of total world imports of palm kernel oil. About 10% of the quantity imported, i.e., about 30,000 tons, is re-exported to Eastern Europe, the Middle and Near East, and Africa (Appendix Tables 28 to 35 and Appendix Figs. 9 to 12).

Table D-8 Palm Kernel Exports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
Nigeria	236	79	40.0	535	178	47.8
Indonesia	86	29	13.9	119	40	10.8
East Malaysia	80	27	13.0	49	16	4.3
Togo	30	10	4.8	24	8	2.2
Sierra Leone	34	11	5.3	113	38	10.2
Guinea-Bissau	26	9	4.3	16	5	1.3
Ivory coast	26	9	4.3	83	28	7.5
Cameroon	n.a.	n.a.	n.a.	48	16	4.3
Guinea	n.a.	n.a.	n.a.	34	11	3.0
Others	107	36	17.3	94	31	8.3
World	625	208	100.0	1,115	372	100.0

Note : n.a. not available

Source: Oil World

Table D-9 Palm Kernel Imports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
UK	196	65	31.4	112	37	10.6
West Malaysia	84	28	13.5	n.a.	n.a.	n.a.
Germany, FR	33	11	5.3	117	39	11.2
Denmark	80	27	13.0	55	18	5.2
Japan	84	28	13.5	38	13	3.7
Portugal	25	8	3.9	30	10	2.9
Netherlands	55	18	8.7	501	167	47.9
France	n.a.	n.a.	n.a.	55	18	5.2
Others	65	22	10.6	139	46	13.2
World	622	207	100.0	1,047	349	100.0

Note : n.a. not available

Source: Oil World

Table D-10 Palm Kernel Oil Exports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
West Malaysia	660	220	59.3	209	70	36.5
Nigeria	146	49	13.2	121	40	20.8
Netherlands	60	20	5.4	n.a.	n.a.	-
Zaire	54	18	4.9	104	35	18.2
Ivory coast	39	13	3.5	n.a.	n.a.	-
Others	154	51	13.7	47	16	8.3
World	1,113	371	100.0	576	192	100.0

Note : n.a. not available

Source: Oil World

Table D-11 Palm Kernel Oil Imports by 3-Year Totals and Yearly Averages for 1979-81 and 1972-74

(1,000 MT, %)

	1979 - 81			1972 - 74		
	3-Year total	Yearly average	Share of world total	3-Year total	Yearly average	Share of world total
Netherlands	246	82	22.0	44	15	6.5
USA	231	77	20.6	162	54	23.4
UK	168	56	15.0	194	65	28.1
Germany, FR	89	30	8.0	73	24	10.4
France	46	15	4.0	70	23	10.0
India	21	7	1.9	n.a.	n.a.	-
Canada	n.a.	n.a.	n.a.	16	5	2.2
Italy	n.a.	n.a.	n.a.	38	13	5.6
Others	319	106	28.4	95	32	13.9
World	1,120	373	100.0	694	231	100.0

Note : n.a. not available

Source: Oil World

III. Babassu Kernel Oil

Babassu kernel oil is exported only by Brazil. As shown in Appendix Table 36, in the 1970s there were large differences in export volume depending on the year. The level of exports moved in step with the international price of coconut oil and showed a large increase in 1974 and 1979 when the price of coconut oil increased.

In other words, babassu kernel oil is traded on the international market only when the international supply of coconut oil becomes tight, and it is considered to have a strong substitutive relationship with coconut oil.

It appears that when the price of coconut oil becomes high, as mentioned above, the export of babassu kernel oil is exported disregarding domestic demand. Brazil imported 6,000 tons of coconut oil in 1973 and 2,300 tons in 1974 when the price of babassu oil increased, while exporting 40,300 tons of babassu kernel oil in 1974, the peak level in the 1970s. Although the international price of coconut oil in both 1973 and 1974 was high, the price of the coconut oil imported by Brazil was much lower than the export price of babassu kernel oil.

Argentina is the sole constant buyer of babassu kernel oil. The quantity exported to this country, however, varies from year to year in the range of 200 to 2,000 tons. Other export destinations are many coconut oil consuming countries such as the United States, the Federal Republic of Germany and the Netherlands (Appendix Tables 36 and 37 and Appendix Fig. 13).

Table D-12 Imports of Coconut Oil

	(MT)	(US$1,000)	(US$/MT)	Coconut oil CIF Rotterdam price (US$/MT)	Babassu Oil export price FOB Brazil (US$/MT)
1970	0	0	-	346	277
1971	40	14	350	299	372
1972	0	0	-	215	327
1973	6,001	2,824	471	513	626
1974	2,261	1,095	484	998	912
1975	0	0	-	393	717
1976	0	0	-	418	599
1977	50	40	800	578	668
1978	0	0	-	683	742
1979	0	0	-	985	863
1980	0	0	-	674	703
1981				570	1,033

Source: Coconut oil imports : FAO
Coconut oil CIF Rotterdam price: Oil World
Babassu oil export price : CACEX, Brazil

E. PRICE

The international price of coconut oil is generally based on the quotations at New York and Rotterdam markets, whereas the traditional London market still keeps its position as the center of international copra price.

The recent prices of copra and coconut oil show a large fluctuation in comparison with those of soybean and soybean oil. This is because soybean and soybean oil have a large producing country, the United States, and in addition, Brazil and Argentina, also large producers, by ways of covering the off-crop season in the Northern Hemisphere, thus increasing the supply. On the other hand, the supply of copra and coconut oil is limited to the Philippines and Indonesia, of which the latter is becoming a consumer rather than a supplier because its domestic consumption is increasing and production is leveling off, thus leaving only the Philippines as the main supplier to the world market. However, the prices of copra and coconut oil are not necessarily dominated by the Philippines, as the prices are influenced by the prices of other oils especially soybean oil and palm oil.

The factors determining the prices of copra and coconut oil are:

a. The production trends of copra and coconut oil in the Philippines

b. The supply and demand trends and international prices of the vegetable oils

c. The trends of the petroleum price

d. The trends of supply and demand of copra and coconut oil in Indonesia

e. The buying trends of the USSR, China and India

f. The trends of the domestic copra price policy and export surcharge system effected by the Philippine Government

g. The supply and demand trends for the synthetic alcohols produced using ethylene, a product competing with the higher alcohols produced using coconut oil

h. Trends of the world economy

Recently the Philippine Government has established the United Coconut Oil Mills, Inc. to control the coconut oil price, and is also promoting the use of coconut oil as a substitute for diesel oil, and in addition is endeavoring to adjust the stock of coconut oil possessed by

the Philippines but located in the consuming countries (New York and Rotterdam). However, these measures are not always successful, and some people consider that they are causing the depression of the coconut oil price.

This means that the price of coconut oil in competition with many substitute products moves in accordance with the factors mentioned above, and that it is difficult to influence it by the intention of the producing country only.

Palm kernel oil has showed similar price movements to those of coconut oil which is its competing oil. The production and trade of palm kernel and palm kernel oil are more stable than those of copra and coconut oil, but since the absolute volumes are only one quarter as much as those of copra and coconut oil, both in terms of production and trade, their international prices are greatly affected by the price movements of copra and coconut oil.

The price of palm kernel oil was slightly higher than that of coconut oil after 1970, but since 1979 their price positions have been reversed.

The international trade in palm kernel has become concentrated to the oil form as in the case of copra. The production of palm kernel is sharply increasing and the rate of increase is higher than that of copra. Since consumption of palm kernel oil in the producing countries is high, this increase in production does not necessarily result in a similar increase in export volume. However, if the high rate of growth of palm kernel production continues, it may become a strong competitor of coconut oil in the world market which the coconut oil exporters, the Philippines in particular, can not disregard. Anyhow the structure of the palm kernel oil price moving interlocked with that of coconut oil will remain unchanged in the future because of the characteristics of the two oils.

Babassu kernel oil is, as previously mentioned, exported when the supply of the coconut oil is short in the overseas market, and the export price in Brazil shows almost the same movement as the international price of coconut oil.

The international prices of these three commodities in the 1970s reached their peaks in 1973-1974 and 1979, and their lowest levels in 1972 and 1975-1976. The peak prices in 1973 and 1979 were directly influenced by the oil crisis, and were also caused by the decreased production of copra in the Philippines in 1973-1974 due to abnormal climatic conditions such as drought. The lowest prices in 1972 and 1975-1976 were caused by an oversupply due to the increased production of coconut (Appendix Table 38 and Appendix Figs. 14 and 15).

F. SHORT-TERM OUTLOOK

Production of copra can be increased by extending the area under cultivation and raising yield per hectare. Producers make efforts to expand planting area and/or increasing yield, needless to say, depend to a large extent on the market prices of the products.

In some producing countries (especially those in the South Pacific region) even when coconuts are grown, if the price of copra is too low, fallen nuts are not gathered and therefore, no copra is produced.

To increase yield per hectare, the critical factors are introduction of high-yielding varieties, and improvement in techniques. As for the replanting with high-yielding hybrids, all producing countries have limitations in the production of its seeds (only the Philippines has a sufficient number of propagation farms; other countries are attempting to increase their number). It is thought, therefore, that these hybrids will not bring about increased production until after the mid-1980s. In the Philippines (the largest producer) the high-yielding variety (or varieties) to be recommended is still under investigation. Thus the increase in actual world production by the introduction of hybrids is thought likely to occur only after 1990.

Consequently, for the time being, production cannot be increased except by extending the cultivated area and increasing yield per hectare by improving cultivation techniques.

Expansion in cultivated area was reportedly undertaken at a considerable rate during the late 1970s in the two major producing countries of the Philippines and Indonesia, but in the former the speed of new planting has slackened because of recent low prices. The trees that were planted in the late 1970s should begin bearing crops by the mid-1980s.

As long as the prices continue to stay at their present low level, producers have no interest in improving cultivation techniques; rather, emphasis is being placed on increasing profitability by greater utilization of coconut farms, through mixed cropping and grazing of animals under the trees.

As stated above, copra production in some regions is presumably sluggish reflecting current prices; but given the considerable number of farmers earning a living from the production of copra, output as a whole is thought unlikely to decrease except for the unpredictable decrease. However, possibility of damage by droughts and cyclones.

Palm kernel is a byproduct of palm oil, and its future output depends on the level of palm oil production. However, the proportion of palm kernel contained in fruits of the high-yielding variety (Tenera) is lower than in other varieties (the proportion of kernels in dura fruit bunches is 6%; in Tenera 4%), and considering the increasing prevalance of this high-yielding variety, production levels of palm kernel cannot be expected to rise as rapidly as those of palm oil. On the other hand, however, the new technology of raising yield of palm fruit by the use of insects for pollination now being tried in Malaysia increases number of fruits per tree and per hectare, but the fruit thus produced contains higher proportion of kernel (see Oil Palm Section, p. [1]-54, footnote 1).

As for the future of babassu oil, it can be said the output depends on the measures taken by Brazilian Government to enhance production in the future. That is to say, if the current system of gathering, crushing and distribution of nuts continues, a sharp increase cannot be expected. However, state governments such as Maranhao, as well as the Federal Government, are planning a variety of projects aimed at developing the babassu industry. If these projects include expansion of the gathering areas by improving the roads in natural forests, for easier transportation, and by increasing handling efficiency by mechanization of nut kernel crushing, there exists a strong possibility the supplies of babassu seeds will be increased. However, there are still many problems to be considered: reorganization of the infrastructure, measures to secure a labor force and the time required to promote the programs of extraction and utilization of byproducts being planned by the AGRIMA (Agro-industry Corp. of Maranhao).

Consumption of coconut oil will presumably grow steadily in such producing countries as Indonesia, India and the Philippines, because of its traditionally strong demand. In industrialized nations, consumption is affected by the relative prices of soybean oil used in food, and petroleum products for industrial use.

Indonesia is even encouraging its people to use palm kernel oil and palm oil as a substitute for coconut oil for which consumers preference is traditionally strong. Therefore, increased production of coconut oil will be absorbed domestically.

Consumption growth in India is estimated at the same rate as that of its population, and a sharp increase is not likely.

In the Philippines, increased exports of highly-processed products, along with increased consumption by the growing population, will expand domestic consumption of coconut oil. The substitution of coconut oil for diesel oil still has some technical problems, and the increase of consumption for this purpose as is planned by the government is uncertain.

The United States' strong demand for coconut oil is for its industrial use such as in soap production, but competition with other vegetable oils is intense for its use as a food. For food use, if exports of soybean and soybean oil do not increase sharply, surpluses will develop and consumption of imported coconut oil will decrease.

The movements of coconut oil consumption in Western Europe will be determined by the relative prices of other oils and petroleum products because the price elasticities are high in that region.

Palm kernel oil entered the market as a substitute for coconut oil, and demand for palm kernel oil itself is growing in industrialized nations, partly because stable supplies are needed. Basically, however, consumption depends on stability of the coconut oil supply and the prices relative to that of coconut oil.

Babassu kernel oil is required on international markets only when coconut oil is in short supply, and except in Argentina, constant demand cannot be found. Thus it is estimated that consumption expansion on international markets will depend on the costs incurred within Brazil before export, and stability of supply. That is to say, if a stable supply of babassu oil can be maintained and at about the same price as coconut oil, coconut oil and palm kernel oil consumers have no reason to reject the use of babassu kernel oil. A prospective and nearby market is the United States, a big consumer of coconut oil, although in this market, its competitiveness with other oils, chiefly coconut oil, may be in question.

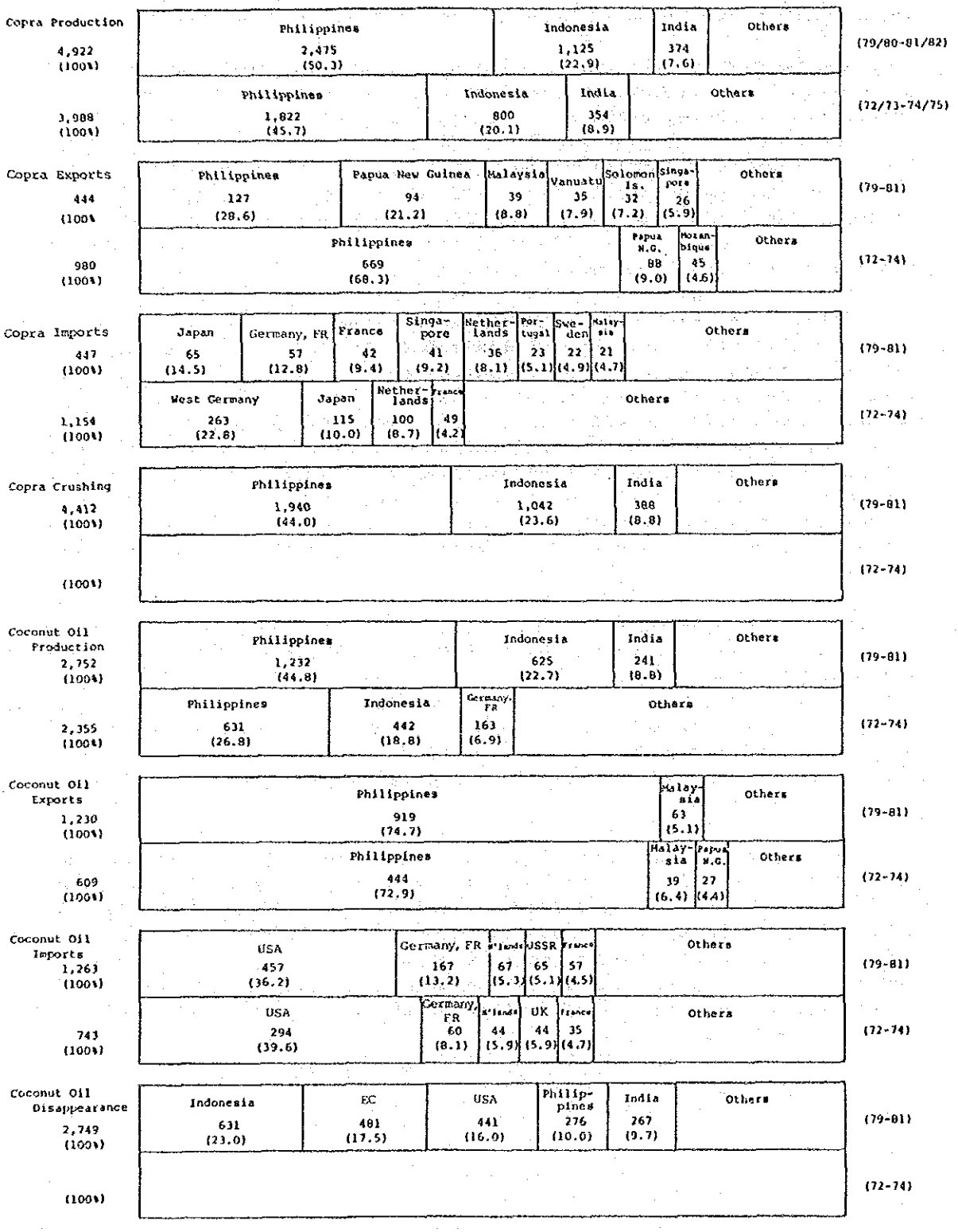
Results of the short-term projections until 1985, done in the same way as with palm oil, are given in Appendix Tables 39 and 40.

These results coincide, for the most part, with the outlook arrived at by analyzing the above-mentioned movements. That is, coconut oil will increase slowly in both production and consumption, and by 1985, production will exceed consumption slightly, although not creating a serious surplus.

Production of palm kernel oil will increasingly grow, though not as rapidly as in the 1970s. Although its growth parallels that of palm oil, the prevalance of Tenera (whose ratio of kernel to fruit is low), as mentioned before, will cause its growth rate to be lower than that of palm oil. While consumption of palm kernel oil will stay sluggish in developed nations, it will rise in developing countries during the 1980s. In the final analysis, there will be an undersupply by 1985.

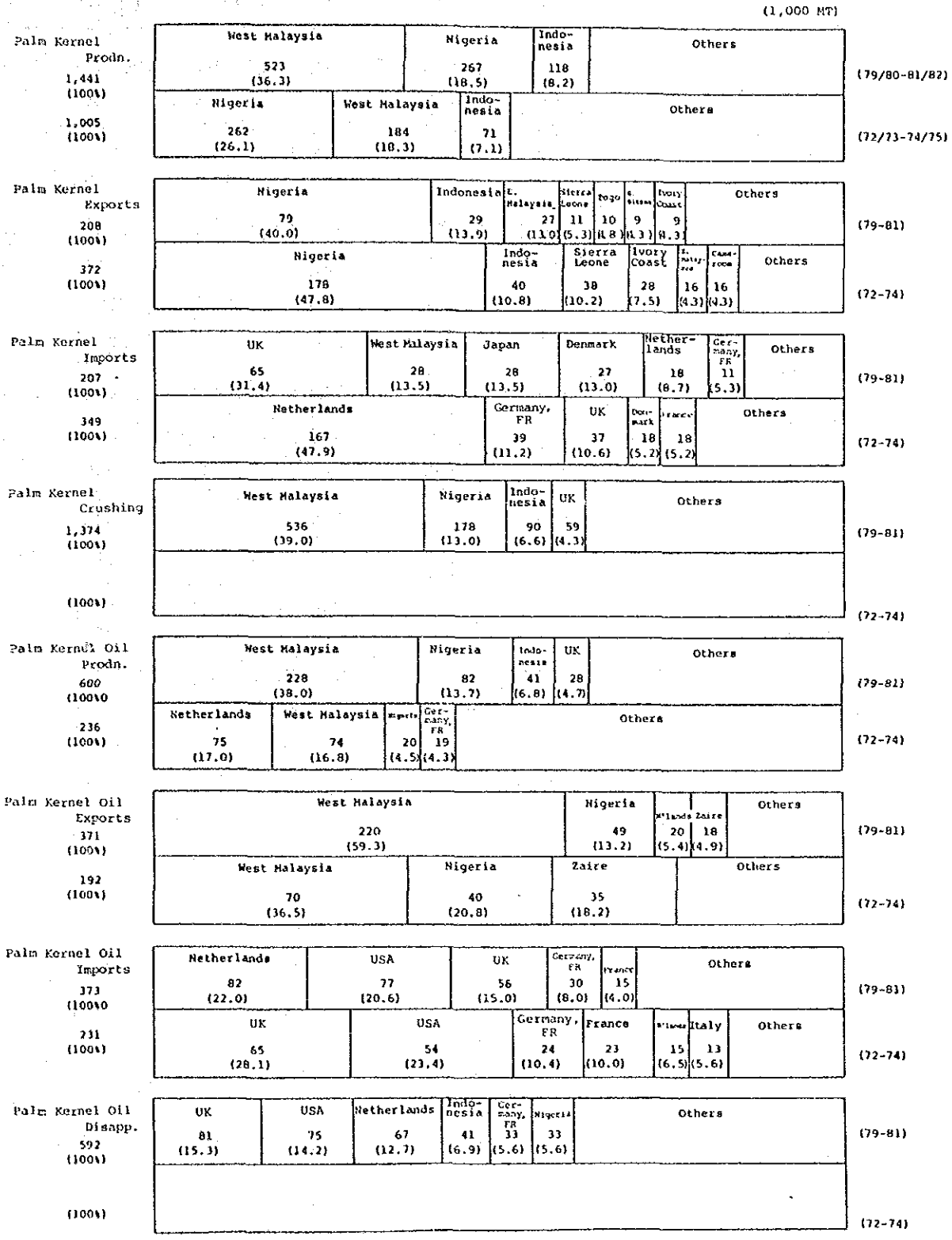
Appendix Table 1 Flow of Copra and Coconut Oil, by Yearly Average for 1979-81 and 1972-74 (79/80-81/82) (72/73-74/75)

(1,000 MT)



Appendix Table 2 Flow of Palm Kernel and Palm Kernel Oil by Yearly Averages for 1979-81 and 1972-74

(1,000 MT)



Appendix Table 3 World Coconut Production

(1,000 MT)

	1969-71	1977	1978	1979	1980	1981
World	29,355	34,063	34,649	33,985	35,159	36,665
Africa	1,466	1,607	1,580	1,463	1,494	1,515
Mozambique	400	440	400	400	420	420
Ghana	257	300	300			
Ivory Coast	49	125	125	150	155	159
North and Central America	1,356	1,572	1,684	1,293	1,460	1,472
Mexico	815	1,032	1,120	700	812	827
South America	612	534	553	567	593	601
Asia	23,734	28,090	28,564	28,235	29,293	30,803
Philippines	7,601	11,587	11,661	8,860	9,640	11,050
Indonesia	7,333	8,779	8,900	10,700	10,900	10,800
India	4,472	4,260	4,370	4,332	4,500	4,500
Malaysia	1,277	1,021	1,034	1,237	1,219	1,207
Sri Lanka	1,963	1,384	1,520	1,819	1,540	1,716
Thailand	713	663	670	688	900	900
Viet Nam	100	132	135	326	311	350
Oceania	2,187	2,259	2,268	2,428	2,319	2,274
Papua New Guinea	741	756	750	878	818	800
Solomon Is.	184	204	204	243	215	193
Western Samoa	193	215	220	200	220	200

Source: FAO, Production Yearbook, 1978, 1981

Appendix Table 4 APCC Coconut Production

(1,000 MT copra equivalent)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Increase over 10 years (1,000 MT)	Growth rate (%)
India	800	853	894	912	941	874	887	901	858	859	59	0.8
Indonesia	1,173	1,208	1,283	1,259	1,287	1,335	1,381	1,527	1,512	1,461	288	2.5
Malaysia	176	179	181	174	183	166	170	187	192	190	14	0.9
Papua New Guinea	135	137	140	142	138	135	137	135	138	143	8	0.6
Philippines	1,260	1,356	1,756	2,174	1,871	1,424	2,199	2,742	2,440	2,501	1,241	7.9
Sri Lanka	467	496	542	574	395	412	525	473	371	448	-19	-0.5
Thailand	115	114	113	112	112	107	103	104	109	110	-5	-0.5
Trust Territory of Pacific Islands	20	22	15	15	14	16	16	15	14	15	-5	-3.0
Solomon Islands	36	36	37	35	36	36	37	37	36	37	1	0.3
Western Samoa	35	35	34	37	39	33	35	39	36	40	5	1.5
Total	4,264	4,525	5,036	5,555	5,129	4,539	5,589	6,073	5,570	5,796	1,532	3.5

Source: APCC

Appendix Table 5 Area under Coconut in the APCC Countries

(1,000 ha)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Increase over 10 years	Growth rate (%)
India	988	1,033	1,046	1,078	1,125	1,140	1,069	1,074	1,077	1,080	92	1.0
Indonesia	1,685	1,810	1,889	1,908	2,006	2,131	2,211	2,325	2,325	2,435	750	4.2
Malaysia	304	310	313	318	314	320	336	331	323	325	21	0.7
Papua New Guinea	246	247	241	248	250	250	255	254	250	252*	6	0.3
Philippines	1,846	1,884	2,048	2,126	2,133	2,206	2,280	2,521	2,714	3,311	1,465	6.7
Sri Lanka	466	466	466	466	466	466	466	466	466	466	0	0
Thailand	300	320	333	351	370	389	395	400	400	400*	100	3.2
Trust Territory of Pacific Islands	30	30	30	30	30	30	30	30	26	30	0	0
Solomon Islands	32	32	32	33	33	33	34	34	34	34	2	0.7
Western Samoa	28	28	30	30	32	33	34	36	38	40	12	4.0
Total	5,925	6,160	6,420	6,588	6,759	6,998	7,110	7,471	7,653	8,377	2,452	3.9

* Estimate

Source: APCC

Appendix Table 6 Coconut Production per Hectare
(Copra Equivalent)

(MT)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1969-78
India	0.81	0.83	0.85	0.85	0.84	0.77	0.83	0.84	0.80	0.80	0.82
Indonesia	0.70	0.67	0.68	0.66	0.64	0.63	0.62	0.67	0.65	0.60	0.65
Malaysia	0.58	0.58	0.58	0.55	0.58	0.52	0.51	0.56	0.59	0.58	0.56
Papua New Guinea	0.55	0.55	0.58	0.57	0.55	0.54	0.54	0.53	0.55	0.57	0.55
Philippines	0.68	0.72	0.86	1.02	0.88	0.65	0.96	1.09	0.90	0.76	0.86
Sri Lanka	1.00	1.06	1.16	1.23	0.85	0.88	1.13	1.02	0.80	0.96	1.01
Thailand	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.26	0.27	0.28	0.31
Trust Territory of Pacific Islands	0.67	0.73	0.50	0.50	0.47	0.53	0.53	0.50	0.54	0.50	0.55
Solomon Islands	1.13	1.13	1.16	1.06	1.09	1.09	1.09	1.09	1.06	1.09	1.10
Western Samoa	1.25	1.25	1.13	1.23	1.22	1.00	1.03	1.08	0.95	1.00	1.11
Total	0.72	0.73	0.78	0.84	0.76	0.65	0.79	0.81	0.73	0.69	0.75

Source: Compiled from APCC data

Appendix Table 7 Copra Production

(MT)

	Philippines	Indonesia	India	Malaysia	Papua New Guinea	Mexico	Sri Lanka	Mozambique	Thailand	Viet Nam	World total
1966	1,484,706	723,000	309,000	176,820	129,240	170,000	234,240	41,800	37,000	22,300	3,665,535
1967	1,576,744	664,000	317,000	174,299	117,519	184,628	211,860	57,400	33,000	22,500	3,704,094
1968	1,541,800	760,000	330,000	191,003	127,390	195,879	213,260	60,400	35,000	20,000	3,820,250
1969	1,515,547	785,000	349,000	174,436	135,041	141,617	199,080	53,900	32,000	17,000	3,777,696
1970	1,656,200	744,000	362,000	201,292	129,430	144,439	210,790	60,000	28,000	21,000	3,903,518
1971	1,574,100	730,000	365,000	183,660	129,479	152,162	216,240	64,000	33,000	22,500	3,831,415
1972	1,703,000	762,000	357,000	176,663	127,779	146,515	295,000	60,000	37,100	22,000	4,022,225
1973	1,698,396	676,000	349,000	215,917	129,256	114,236	94,594	66,000	36,700	24,000	3,728,492
1974	1,702,700	855,000	359,000	202,695	128,490	150,000	108,006	63,000	38,500	23,000	3,972,210
1975	1,718,545	1,009,000	365,000	234,381	134,559	147,034	203,082	63,000	40,800	22,400	4,285,456
1976	2,006,680	963,330	354,000	231,679	128,040	160,099	151,382	83,000	43,100	24,000	4,477,581
1977	2,119,692	951,480	377,000	218,000	135,704	158,829	72,690	80,000	45,400	32,000	4,537,386
1978	2,132,950	950,000	367,000	207,000	145,867	160,000	132,266	75,000	47,700	36,800	4,621,576
1979	1,890,000	950,000	370,000	210,000	160,147	110,000	135,000	75,000	50,000	39,200	4,362,008
1980	1,854,000	1,301,000	375,000	210,000	148,000	140,000	98,000	68,000	51,000	39,000	4,663,000
1981	2,275,000	1,254,000	370,000	208,000	144,000	143,000	123,000	70,000	52,000	40,000	5,054,000

Source: 1966-79 : FAO revised figures, 1980
1980, 81: FAO, Production Yearbook, 1981

Appendix Table 8 World Production of Copra by Country

(1,000 MT)

	81/82	80/81	79/80	78/79	77/78	76/77	75/76	74/75	73/74	72/73	71/72
Philippines	2,650*	2,520*	2,200*	2,050*	2,600*	2,190*	2,790*	2,020*	1,500*	1,946*	2,142*
Indonesia	1,130*	1,095*	1,150*	982*	920*	1,020*	1,055*	885*	720*	795*	825*
India	376*	372*	375*	370*	370*	375*	360*	355*	351*	355*	355*
Mexico	143*	140*	148*	145*	160*	159*	157*	145*	145*	147*	147*
W. Malaysia	104	98p	103	105	100	112	120	136	118	130	127
Sri Lanka	105*	93*	93*	112*	122*	92*	176*	180*	97*	130*	248*
Solomon Is.	35*	34*	29*	33	28	29	29	26	29	16	21
Venezuela	12*	12	12	12*	13*	18*	16*	15*	14*	13*	13*
Others	585*	581*	570*	566*	582*	525*	542*	557*	564*	576*	615*
World	5,140	4,945	4,680	4,375	4,895	4,520	5,240	4,319	3,538	4,108	4,493

* Estimate

Source: Oil World, Jan. 29, 1982

Appendix Table 9 World Production of Coconut Oil by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
Philippines	1,416*	1,219*	1,060*	1,213*	1,000*	1,067*	783*	630*	602*	661*
Indonesia	639*	677*	559*	586*	590*	675*	521*	448*	411*	467*
India	239*	242*	241*	252*	238*	231*				
Germany, FR	43*	33	35	133	223	338	254	45	184	261
Mexico	89*	91*	88*	101*	100*	101*				
Sri Lanka	61*	47*	73*	75*	44*	100*				
Others	439	472	491	529	529	620	1,060	932	1,140	1,283
World	2,926	2,781	2,547	2,888	2,725	3,131	2,618	2,055	2,337	2,672

* Estimate

Source: Oil World

Appendix Table 10 Palm Kernel Production

(MT)

	Malaysia	Nigeria	Brazil	Indonesia	Benin	Zaire	China	Cameroon	Guinea	Sierra Leone	World total
1966	44,130	421,000	187,301	35,000	46,597	83,000	15,000	36,800	12,250	57,000	1,112,858
1967	50,755	241,000	191,764	34,800	39,861	101,900	18,000	49,600	15,300	21,799	952,883
1968	62,667	214,000	193,044	40,300	49,099	102,300	22,000	50,900	16,300	70,000	1,019,355
1969	78,319	255,000	198,981	41,669	64,000	110,000	25,000	45,912	15,300	56,300	1,074,768
1970	92,371	299,300	235,243	48,763	61,197	95,900	28,000	39,864	15,400	67,200	1,178,498
1971	126,298	307,000	221,574	56,507	80,760	91,400	32,000	36,436	14,000	56,800	1,222,388
1972	150,600	270,000	230,000	59,121	84,598	86,100	37,000	38,000	10,600	54,400	1,199,198
1973	167,100	231,000	228,878	64,100	82,073	80,500	38,000	39,500	13,800	47,200	1,176,448
1974	215,396	310,100	239,521	74,200	81,844	76,300	39,000	41,000	13,500	48,800	1,351,239
1975	254,000	300,400	225,414	83,500	83,000	75,100	39,000	45,000	10,000	53,800	1,370,439
1976	280,000	295,100	270,000	82,100	80,000	72,500	40,000	45,000	9,000	44,200	1,432,344
1977	335,000	301,900	230,000	92,307	80,000	71,600	42,000	44,000	12,000	42,000	1,465,468
1978	368,000	239,030	230,000	99,422	60,000	70,800	44,000	45,000	9,000	30,000	1,394,599
1979	474,000	350,000	238,700	115,000	70,000	70,000	46,000	45,000	10,000	50,000	1,683,876
1980	557,000	345,000*	265,988*	121,105	73,000F	69,300*	48,000F	46,000F	35,000*	30,000*	1,832,081
1981	588,000	350,000F	275,485*	131,000	75,000F	65,000F	46,000F	46,000F	35,000F	30,000F	1,891,056

* Unofficial figures
F FAO estimate

Source: FAO, Production Yearbook, 1980

Appendix Table 11 World Production of Palm Kernel by Countries

	Oct. Sept.									(1,000 MT)	
	1981/82	80/81	79/80	78/79	77/78	76/77	75/76	74/75	73/74	72/73	71/72
Nigeria		246*	288*	286*	234*	330*	320*	265*	276*	245	279
China	33*	29*	39*	42*	40*	41*	39*	39*	38*	37*	36*
Indonesia	135*	120*	116	113	93	91	83*	82*	69	63	59
W. Malaysia	580*	529	517	422	302	309	249	225	174	152	131
Other countries		498*	500*	447*	471*	489*	444*	444*	448*	458*	530*
World	1,500	1,422	1,460	1,310	1,140	1,260	1,135	1,055	1,005	955	1,035

* Estimate

Source: Oil World

Appendix Table 12 World Production of Palm Kernel Oil by Countries

									(1,000 MT)	
	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
West Malaysia	241*	246*	196	142	143	117	108	84	72	66
Nigeria	75*	84*	86*	71*	48*	41	45*	59*		
Indonesia	46*	36*	42*	46*	29*	28*				
UK	27	32	24	21	27	36	31	21	14	16
Zaire	25*	23*	20*	21	22	23				
Netherlands				22	34	53	50	62	54	109
Benin						26				
Germany, FR							19	27	16	15
Others or other specified countries	188	210	198	165	217	175	211	204	250	254
World total or total of specified countries	602	631	566	488	520	499	464	457	406	460

* Estimate

Source: Oil World

Appendix Table 13 Estimated Coconut Oil Supply and Utilization by Regions, 1977-1982

(1,000 MT)

	1977	1978	1979	1980	1981	1982
PRODUCTION						
NORTH AMERICA	107	115	115	102	107	108
SOUTH AMERICA	22	29	27	28	28	28
EUROPE	438	333	207	186	198	166
AFRICA	65	72	61	62	62	62
ASIA	2249	2411	2230	2293	2622	2785
OCEANIA	96	89	98	93	90	92
SUBTOTAL	2977	3049	2738	2764	3107	3241
EXPORTS						
NORTH AMERICA	10	8	7	7	7	3
SOUTH AMERICA	0	0	0	0	0	0
EUROPE	160	122	77	58	61	56
AFRICA	6	6	5	5	5	4
ASIA	860	1078	958	1067	1255	1358
OCEANIA	65	74	88	83	79	81
SUBTOTAL	1101	1288	1135	1220	1407	1502
IMPORTS						
NORTH AMERICA	488	507	474	437	574	535
SOUTH AMERICA	11	6	9	12	12	12
EUROPE	351	438	440	484	555	564
AFRICA	0	0	0	0	0	0
ASIA	94	190	149	119	237	247
OCEANIA	19	18	19	17	20	20
SUBTOTAL	963	1159	1091	1069	1398	1378
TOTAL DOM. UTILIZATION						
NORTH AMERICA	580	609	586	531	674	640
SOUTH AMERICA	33	35	36	40	40	40
EUROPE	627	652	568	607	698	674
AFRICA	59	66	56	57	57	58
ASIA	1475	1519	1386	1384	1592	1683
OCEANIA	50	33	29	27	31	31
SUBTOTAL	2824	2914	2661	2646	3092	3126
ENDING STOCKS						
NORTH AMERICA	61	67	63	64	64	64
SOUTH AMERICA	0	0	0	0	0	0
EUROPE	22	19	21	26	20	20
AFRICA	0	0	0	0	0	0
ASIA	107	111	146	107	119	123
OCEANIA	0	0	0	0	0	0
SUBTOTAL	190	197	230	197	203	207

Source: USDA

Appendix Table 14 Consumption of Coconut Oil by Use in Major Consuming Countries
(1972-1974 and 1975-1977 averages)

(1,000 MT)

	1972 - 74				1975 - 77			
	Manufacturing		Food	Total	Manufacturing		Food	Total
	Food	Non-food			Food	Non-food		
Copra producing countries								
Indonesia	0	66	400	466	0	0	670	670
	(0)	(14.2)	(85.8)		(0)	(0)	(100)	
India	0	35	143	177	153	34		187
		(19.8)	(80.8)		(81.8)	(18.2)		
Philippines	0	78	143	221	0	45	158	203
		(35.3)	(64.7)			(22.2)	(77.8)	
Mexico	0	38	51	88	0	13	80	93
		(43.2)	(58.0)			(14.0)	(86.0)	
Sri Lanka	10	0	43	52	9	0	35	44
	(19.2)		(82.7)		(20.5)	(0)	(79.5)	
Malaysia	0	21	42	63	0	54	29	83
		(33.3)	(66.7)			(65.1)	(34.9)	
Non-copra producing countries								
USA	36	175	140	351	49	271	147	467
	(10.3)	(49.9)	(39.9)		(10.5)	(58.0)	(31.5)	
Germany, FR	175	0	0	175	219	0	0	219
	(100)	(0)	(0)		(100)	(0)	(0)	
USSR	0	26	0	26	0	53	0	53
	(0)	(100)	(0)		(0)	(100)	(0)	
Japan	13	21	49	84	14	13	73	100
	(15.5)	(25)	(58.3)		(14.0)	(13.0)	(73.0)	
France	22	30	10	62	19	56	26	101
	(35.5)	(48.4)	(16.1)		(18.8)	(55.4)	(25.7)	
UK	38	0	0	38	5	61	6	72
	(100)	(0)	(0)		(6.9)	(84.7)	(8.3)	
Netherlands	64	0	0	64	58	0	0	58
	(100)	(0)	(0)		(100)	(0)	(0)	
Italy	17	17	0	34	20	15	5	39
	(50)	(50)	(0)		(51.3)	(38.5)	(12.8)	

Note : Figures in ( ) show percentages of total.

Appendix Table 15 Copra Crushing by Countries without Copra Production

(1,000 MT)

	1981	1980	1979	1978	1977	1976
Belgium-Luxemburg	-*	-	5	15	15	19
Denmark	9	16	18	18	20	44
France	21*	56	53	58	59	72
Ireland	.*	.*	10	16	13	10
Italy	8*	12*	10*	7*	9*	3*
Netherlands	-*	48	61	69	67	148
UK	14	9	21	21	27	23
Germany, FR	68	54	57	213	366	539
EC total	120	195	235	416	575	868
Finland	-*	2*	2*	2*	3*	8*
Norway	14*	11*	15*	10*	13*	14*
Portugal	23*	20	24	23	24	17
Spain	5*	6*	4*	9*	9*	14*
Sweden	28*	20	25	41	37	38
Switzerland	4*	3*	1*	6*	6*	17*
Western Europe total	193	254	306	507	666	976
German DR	15	15	15	NA	NA	NA
USSR	7	12	11	10	20	10
Japan	72	67	54	91	98	110
Total of specified countries	287	348	386	608	784	1,096

* Estimate

Source: Oil World

Appendix Table 16 Palm Kernel Crushing

(1,000 MT)

	1981	1980	1979	1978	1977	1976
Denmark	39	20	17	22	25	24
France		9	7	12	10	8
Greece	1	1	2	.*	3*	8*
Netherlands	-	-	37	47	71	115
UK	58	68	52	45	56	77
Germany, FR	3	26	6	13	75	50
EC total	102	123	121	139	240	282
Portugal	6	12	5	5	5	6
Spain	-	-	-	-	-	.*
Switzerland	1	1	1	7*	9*	7*
Western Europe total	109	136	127	151	253	295
USSR	2	3	2	4*	2*	4*
Benin	32	37	26	12*	25*	55*
Nigeria	163	183	188	155*	105*	90*
Zaire	56	50	43	47*	53	57
Mexico	13	13	14	15*	27*	19*
China	30	36	41	41*	41*	40*
Indonesia	100	79	90	99	62	60
Japan	13	14	9	6	11	6
West Malaysia	572	578	459	334	335	261
Other countries	298	316	292	246*	264*	227*
Total	1,387	1,445	1,291	1,109	1,178	1,114
Crushing by non-copra-producing countries	154	189	179	202	307	345

* Estimate

Source: Oil World

Appendix Table 17 Supply and Domestic Use of Coconut Oil

(1,000 MT)

	Indonesia					India					
	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory		Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	247	-	-	247	-	1965	198	-	-	198	-
1966	256	-	-	256	-	1966	197	-	-	197	-
1967	286	1	-	287	-	1967	201	-	-	201	-
1968	265	-	16	249	-	1968	202	-	-	202	-
1969	323	-	4	319	-	1969	209	-	-	209	-
1970	340	-	6	334	-	1970	210	1	-	211	-
1971	477	-	1	476	-	1971	223	-	-	223	-
1972	447	-	34	413	-	1972	215	-	-	215	-
1973	494	-	17	477	-	1973	214	-	-	214	-
1974	546	-	-	546	-	1974	210	-	-	210	-
1975	567	-	27	540	-	1975	216	-	-	216	-
1976	688	2	13	677	-	1976	221	-	-	221	-
1977	708	11	-	719	-	1977	219	5	-	224	-
1978	691	92	-	783	-	1978	222	10	-	232	-
1979	713	27	21	698	21	1979	225	-	-	225	-
1980	772	-	41	737	15	1980	213	-	-	213	-
1981	765	-	10	745	25	1981	212	75	-	287	-
1982	761	-	10	786	20	1982	214	75	-	289	-

	Philippines					Mexico					
	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory		Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	376	-	241	162	32	1965	100	0	0	100	-
1966	472	-	313	163	28	1966	88	-	0	88	-
1967	394	-	235	157	30	1967	79	0	0	79	-
1968	409	-	271	134	34	1968	86	0	-	86	-
1969	381	-	214	164	37	1969	79	0	-	79	-
1970	515	-	334	166	52	1970	74	0	-	74	-
1971	568	-	405	161	54	1971	85	0	-	85	-
1972	659	-	469	193	51	1972	88	0	-	88	-
1973	625	-	429	190	57	1973	74	11	-	85	-
1974	618	-	433	178	64	1974	85	1	-	86	-
1975	769	-	592	168	73	1975	88	-	-	88	-
1976	1,061	-	851	203	80	1976	79	-	-	79	-
1977	1,048	-	791	260	77	1977	76	-	-	76	-
1978	1,214	-	990	224	77	1978	85	18	-	103	-
1979	994	-	795	186	90	1979	82	-	-	82	-
1980	1,072	-	916	180	68	1980	69	-	-	69	-
1981	1,349	-	1,100	200	117	1981	76	-	-	76	-
1982	1,476	-	1,250	220	123	1982	76	-	-	76	-

Appendix Table 17 (cont'd.)

Sri Lanka

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	143	-	88	55	-
1966	125	-	74	51	-
1967	108	-	68	40	-
1968	107	-	64	43	-
1969	112	-	56	56	-
1970	108	-	57	51	-
1971	131	-	89	42	-
1972	133	-	85	48	-
1973	61	-	18	43	-
1974	65	-	22	43	-
1975	120	-	69	51	-
1976	100	-	59	41	-
1977	49	-	2	47	-
1978	80	-	28	52	-
1979	100	-	34	66	-
1980	58	-	2	56	-
1981	85	-	20	65	-
1982	87	-	20	67	-

Malaysia

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	105	-	18	87	-
1966	105	-	25	80	-
1967	117	-	29	88	-
1968	122	-	39	83	-
1969	115	-	53	62	-
1970	130	-	53	77	-
1971	123	-	39	84	-
1972	117	-	27	75	15
1973	113	4	31	76	25
1974	107	2	47	77	10
1975	123	2	39	83	13
1976	121	1	35	85	15
1977	115	2	27	79	26
1978	101	3	22	76	32
1979	125	1	66	60	32
1980	111	2	72	55	18
1981	119	2	75	50	14
1982	132	2	78	60	23

USA

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	166	181	1	375	41
1966	163	226	2	396	33
1967	153	229	2	379	40
1968	178	197	2	373	46
1969	175	194	3	379	27
1970	112	270	4	359	46
1971	120	285	7	397	47
1972	132	308	4	430	53
1973	125	327	5	452	48
1974	17	246	3	254	54
1975	-	394	3	393	52
1976	-	552	20	528	56
1977	-	457	7	445	61
1978	-	464	5	453	67
1979	-	444	4	447	60
1980	-	408	4	400	60
1981	-	540	4	536	60
1982	-	500	-	500	60

Germany, FR

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	154	55	1	208	-
1966	178	32	2	209	-
1967	163	44	5	201	-
1968	95	61	2	154	-
1969	110	45	6	149	-
1970	93	32	12	112	-
1971	170	41	44	167	-
1972	261	45	95	211	-
1973	184	61	52	193	-
1974	45	75	13	107	-
1975	254	36	115	165	18
1976	338	54	154	238	18
1977	223	66	84	202	13
1978	132	11	52	195	9
1979	35	142	11	162	13
1980	33	156	10	179	13
1981	40	200	13	230	10
1982	40	200	13	227	10

Appendix Table 17 (cont'd.)

USSR

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	5	10	-	15	-
1966	4	17	-	21	-
1967	2	8	-	10	-
1968	3	32	-	35	-
1969	3	15	-	18	-
1970	-	23	-	23	-
1971	2	24	-	26	-
1972	22	13	-	35	-
1973	18	3	-	21	-
1974	14	6	-	24	-
1975	18	20	-	38	-
1976	6	71	-	77	-
1977	13	32	-	45	-
1978	6	51	-	57	-
1979	6	48	-	54	-
1980	9	79	-	88	-
1981	13	80	-	93	-
1982	13	100	-	113	-

Japan

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	59	-	1	58	3
1966	68	0	0	68	3
1967	71	0	0	71	3
1968	74	0	0	73	4
1969	74	2	8	76	3
1970	78	2	1	79	3
1971	80	-	2	77	4
1972	83	11	1	93	4
1973	85	23	0	104	8
1974	56	17	5	68	8
1975	57	21	3	80	3
1976	70	31	1	99	4
1977	63	28	1	90	4
1978	54	29	1	84	2
1979	35	48	-	82	3
1980	44	35	-	74	8
1981	42	40	-	85	5
1982	42	45	-	87	5

France

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	61	4	2	63	-
1966	60	11	1	69	-
1967	57	15	1	71	-
1968	49	14	2	61	-
1969	42	23	4	61	-
1970	32	20	3	49	-
1971	37	33	5	65	-
1972	35	49	7	77	-
1973	31	40	42	29	-
1974	30	17	5	40	2
1975	39	49	7	79	4
1976	48	75	12	110	5
1977	38	48	7	81	3
1978	38	56	6	87	4
1979	34	53	10	78	3
1980	36	50	9	77	3
1981	29	57	10	75	4
1982	29	50	10	69	4

United Kingdom

	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	42	43	1	83	-
1966	35	38	1	71	-
1967	28	39	0	67	-
1968	32	47	1	78	-
1969	27	42	0	69	-
1970	20	47	1	66	-
1971	21	43	0	63	-
1972	26	48	2	72	-
1973	25	47	1	71	-
1974	20	32	1	51	-
1975	18	36	2	52	-
1976	14	71	2	83	-
1977	17	63	1	79	-
1978	13	58	4	67	-
1979	13	44	2	55	-
1980	6	46	1	51	-
1981	8	40	1	47	-
1982	8	42	1	49	-

Appendix Table 17 (cont'd.)

	Netherlands					Italy					
	Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory		Prodn.	Imp.	Exp.	Domes-tic use	Final inven-tory
1965	84	3	38	50	5	1965	14	16	0	30	-
1966	107	2	38	56	20	1966	14	19	0	33	-
1967	80	6	37	63	6	1967	12	24	0	36	-
1968	82	8	47	44	5	1968	11	24	0	35	-
1969	79	7	48	38	5	1969	13	28	0	41	-
1970	50	9	37	23	4	1970	8	20	0	28	-
1971	34	39	35	36	6	1971	20	19	0	39	-
1972	37	77	56	56	8	1972	21	21	0	42	-
1973	64	47	63	53	3	1973	10	30	0	40	-
1974	67	10	58	19	3	1974	3	20	0	23	-
1975	93	64	86	69	5	1975	2	32	-	34	-
1976	93	107	110	91	4	1976	9	44	-	53	-
1977	41	65	59	47	4	1977	6	25	-	31	-
1978	43	63	56	49	5	1978	4	43	-	47	-
1979	38	55	50	44	4	1979	6	45	-	51	-
1980	30	57	36	46	9	1980	6	41	-	47	-
1981	32	81	35	82	5	1981	6	40	-	46	-
1982	-	75	30	45	5	1982	6	40	-	46	-

Source: USDA

Appendix Table 18 Apparent Domestic Consumption

(1,000 MT)

Indonesia

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	723	-	175	548	351	0	0	351
1967	664	-	140	524	335	1	0	336
1968	760	-	217	543	348	-	17	331
1969	785	-	157	628	402	0	4	398
1970	744	-	185	559	358	-	5	353
1971	730	-	77	653	418	-	1	417
1972	762	0	42	720	461	0	34	427
1973	676	-	44	632	404	0	16	388
1974	855	-	1	854	547	0	-	547
1975	1,009	-	33	976	625	0	26	599
1976	963	-	3	960	614	1	13	602
1977	951	6	0	957	612	11	-	623
1978	950	4	-	954	611	92	-	713
1979	950	-	-	950	608	27	20	615
1980	1,301	-	35	1,266	810	-	40	770

Crushing rate: 64%

India

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	309	33	0	342	212	-	0	212
1967	317	23	0	340	211	-	0	211
1968	330	17	0	347	215	-	0	215
1969	349	22	-	371	230	-	0	230
1970	362	16	-	378	234	1	0	235
1971	365	8	-	373	231	-	0	231
1972	357	8	0	365	226	-	0	226
1973	349	1	0	350	217	-		217
1974	359	0	0	359	223	-	0	223
1975	365	-	0	365	226	-	0	226
1976	354	2	0	356	221	-	0	221
1977	377	6	0	383	237	16	0	253
1978	367	39	0	406	252	9	-	261
1979	370	14	-	384	238	12	-	250
1980	375	23	-	398	247	-	-	243

Crushing rate: 62%

Philippines

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	1,484	-	910	574	345	-	313	32
1967	1,576	-	763	813	512	-	234	278
1968	1,541	-	664	877	553	-	269	284
1969	1,515	-	556	959	604	-	214	390
1970	1,656	-	425	1,231	776	-	338	438
1971	1,574	-	652	922	581	-	397	184
1972	1,703	-	982	721	454	-	461	-7
1973	1,698	-	734	964	607	-	430	177
1974	1,702	-	267	1,435	904	-	415	489
1975	1,718	-	761	957	603	-	614	-11
1976	2,006	-	822	1,184	746	-	862	-116
1977	2,119	-	634	1,485	936	-	769	167
1978	2,132	-	365	1,767	1,113	-	1,016	97
1979	1,890	-	144	1,746	1,100	-	803	297
1980	1,854	-	121	1,733	1,092	-	917	175

Crushing rate: 63%

Mexico

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	170	-	-	170	109	-	0	109
1967	184	-	-	184	118	0	0	118
1968	195	-	-	195	125	0	-	125
1969	141	-	-	141	90	0	-	90
1970	144	-	-	144	92	0	-	92
1971	152	-	-	152	97	0	-	97
1972	146	-	-	146	93	0	-	93
1973	114	-	-	114	73	11	-	84
1974	150	-	-	150	96	1	-	97
1975	147	-	0	147	94	0	-	94
1976	160	-	0	160	102	9	-	111
1977	158	-	0	158	101	6	-	107
1978	160	-	-	160	102	18	-	120
1979	110	-	-	110	70	11	-	81
1980	140	-	-	140	90	-	-	90

Crushing rate: 64%

Appendix Table 18 (cont'd.)

Sri Lanka

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	234	-	21	213	132	-	74	58
1967	211	-	16	195	121	-	68	53
1968	213	-	22	191	118	-	64	54
1969	199	-	19	180	112	-	56	56
1970	210	-	16	194	120	-	58	62
1971	216	-	17	199	123	-	71	52
1972	295	-	44	251	156	-	87	69
1973	94	-	3	91	56	-	18	38
1974	108	-	0	108	67	-	22	45
1975	203	-	1	202	125	-	54	71
1976	151	-	1	150	93	-	61	32
1977	72	-	0	72	45	-	9	36
1978	132	-	1	131	81	-	30	51
1979	132	-	0	135	84	-	34	50
1980	98	-	-	98	61	-	-	61

Crushing rate: 62%

Malaysia

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	176	12	39	149	83	1	28	56
1967	174	4	16	162	91	1	32	60
1968	191	7	18	180	101	1	42	60
1969	174	6	18	162	91	3	29	65
1970	201	6	15	192	108	4	46	66
1971	183	18	31	170	95	3	43	55
1972	176	21	32	165	92	6	28	70
1973	215	2	12	205	105	4	30	89
1974	202	2	10	194	109	2	46	65
1975	234	16	27	223	125	2	38	89
1976	231	20	31	220	123	1	34	90
1977	218	24	33	209	117	3	27	93
1978	207	23	36	194	109	3	22	90
1979	210	16	29	197	110	1	61	50
1980	210	18	36	192	108	-	62	46

Crushing rate: 56%

Papua New Guinea

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	129	-	89	40	26	-	22	4
1967	117	-	75	42	27	-	23	4
1968	127	-	76	51	33	-	24	9
1969	135	-	95	40	26	-	20	6
1970	129	-	85	44	29	-	21	8
1971	129	-	92	37	25	-	27	-2
1972	127	-	87	40	26	-	26	0
1973	129	-	79	50	33	-	27	6
1974	128	-	73	55	36	-	26	10
1975	134	-	95	39	25	-	26	-1
1976	128	-	92	36	23	-	27	-4
1977	135	-	82	53	34	-	27	7
1978	145	-	85	60	39	-	30	9
1979	160	-	97	63	41	-	29	12
1980	148	-	87	61	40	-	28	12

Crushing rate: 65%

USA

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	243	-	243	158	269	3	424
1967	-	277	-	277	180	194	5	369
1968	-	292	-	292	190	220	2	408
1969	-	272	-	272	177	218	3	392
1970	-	198	-	198	129	260	5	384
1971	-	190	-	190	124	277	9	392
1972	-	209	-	209	136	341	5	472
1973	-	199	-	199	129	258	11	376
1974	-	27	-	27	18	249	5	262
1975	-	-	-	-	-	409	8	401
1976	-	-	-	-	-	572	26	546
1977	-	0	-	0	0	471	17	454
1978	-	0	-	0	0	480	8	472
1979	-	0	-	0	0	500	5	495
1980	-	-	-	-	-	401	18	483

Crushing rate: 65%

Appendix Table 18 (cont'd.)

Germany, FR

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	288	-	288	184	35	2	217
1967	-	237	-	237	152	43	5	190
1968	-	157	-	157	100	60	2	158
1969	-	177	-	177	113	16	6	123
1970	-	150	0	150	96	31	12	115
1971	-	275	0	275	176	41	44	193
1972	-	440	0	440	282	44	95	231
1973	-	273	-	273	175	60	52	183
1974	-	76	0	76	49	74	13	110
1975	-	413	0	413	264	36	115	155
1976	-	525	0	525	336	54	154	236
1977	-	351	0	351	225	65	84	206
1978	-	210	-	210	134	111	52	193
1979	-	53	1	52	33	142	11	164
1980	-	53	-	53	34	155	-	189

Crushing rate: 64%

Japan

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	107	-	107	70	0	0	70
1967	-	112	-	112	73	0	0	73
1968	-	126	0	126	82	0	0	82
1969	-	108	-	108	70	1	0	71
1970	-	126	-	126	82	2	1	83
1971	-	122	-	122	79	0	2	77
1972	-	124	-	124	81	10	1	90
1973	-	134	-	134	87	23	0	110
1974	-	86	-	86	56	17	5	68
1975	-	89	-	89	58	21	3	76
1976	-	110	-	110	72	30	1	101
1977	-	97	-	97	63	27	1	89
1978	-	90	-	90	59	28	1	86
1979	-	55	-	55	36	47	0	83
1980	-	64	-	64	42	34	-	76

Crushing rate: 65%

France

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	96	0	96	62	10	1	71
1967	-	85	-	85	55	14	1	68
1968	-	80	0	80	52	13	2	63
1969	-	63	-	63	41	21	3	59
1970	-	54	-	54	35	18	3	50
1971	-	61	1	60	39	22	4	57
1972	-	50	0	50	33	47	6	74
1973	-	46	-	46	30	40	4	66
1974	-	48	0	48	31	16	5	42
1975	-	64	0	64	42	47	7	82
1976	-	71	0	71	46	71	11	106
1977	-	61	0	61	40	45	7	78
1978	-	52	0	52	34	53	6	81
1979	-	56	0	56	36	45	8	73
1980	-	53	-	53	34	43	-	77

Crushing rate: 65%

Netherlands

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966		167	0	167	107	1	34	142
1967		125	1	126	81	6	33	120
1968		141	0	141	90	8	42	140
1969		123	1	124	80	8	44	132
1970		77	0	77	50	8	31	89
1971		54	0	54	35	39	24	98
1972		84	6	90	58	73	34	165
1973		106	6	112	72	46	48	166
1974		107	0	107	68	10	50	128
1975		166	-	166	106	64	66	236
1976		148	16	154	105	105	86	296
1977		74	2	76	49	69	53	171
1978		83	4	87	56	62	47	165
1979		57	0	57	36	53	31	120
1980		46	-	46	29	55	19	103

Crushing rate: 64%

Appendix Table 18 (cont'd.)

Italy

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	22	-	22	14	18	0	32
1967	-	19	-	19	12	23	0	35
1968	-	17	-	17	11	23	0	34
1969	-	21	-	21	13	28	0	41
1970	-	13	-	13	8	19	0	27
1971	-	32	-	32	20	19	0	39
1972	-	33	-	33	21	21	0	42
1973	-	16	-	16	10	27	0	37
1974	-	5	-	5	3	19	0	22
1975	-	3	-	3	2	32	0	34
1976	-	14	-	14	9	44	0	53
1977	-	9	-	9	6	25	0	31
1978	-	7	-	7	4	42	0	46
1979	-	10	-	10	6	44	0	50
1980	-	-	-	-	-	40	-	40

Crushing rate: 64%

USSR

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	5	-	5	3	16	-	19
1967	-	3	-	3	2	8	-	10
1968	-	5	-	5	3	31	-	34
1969	-	4	-	4	2	14	-	16
1970	-	1	-	1	1	23	-	24
1971	-	3	-	3	2	24	-	26
1972	-	35	-	35	21	13	-	34
1973	-	27	-	27	16	3	-	19
1974	-	29	-	29	17	6	-	23
1975	-	29	-	29	17	20	-	37
1976	-	9	-	9	5	70	-	75
1977	-	19	-	19	11	32	-	43
1978	-	9	-	9	5	50	-	55
1979	-	10	-	10	6	47	-	53
1980	-	15	-	15	9	79	-	88

Crushing rate: 60%

United Kingdom

	Copra				Coconut oil			
	Prodn.	Imp.	Exp.	Apparent domestic consump.	Prodn.	Imp.	Exp.	Apparent domestic consump.
1966	-	56	-	56	36	35	2	69
1967	-	42	0	42	27	38	0	65
1968	-	48	-	48	31	47	1	77
1969	-	46	-	46	29	43	4	68
1970	-	32	-	32	20	48	1	67
1971	-	34	-	34	22	42	0	64
1972	-	41	-	41	26	50	2	75
1973	-	38	-	38	24	48	1	71
1974	-	30	-	30	19	33	1	51
1975	-	29	-	29	19	37	2	54
1976	-	22	-	22	14	70	1	83
1977	-	29	-	29	19	63	2	80
1978	-	19	-	19	12	65	4	73
1979	-	22	0	22	14	49	3	60
1980	-	-	-	-	-	46	-	46

Crushing rate: 64%

Source: Calculated from FAO data

Appendix Table 19 Palm Kernel Oil Consumption

(1,000 MT)

	1977	1978	1979	1980	1981	1982
USA	70	57	75	83	69	75
Canada	7	7	9	9	9	9
Mexico	7	4	4	4	5	5
Colombia	6	8	7	8	8	9
Ecuador	3	3	6	7	7	7
Venezuela	1	1	2	2	2	2
Belgium-Luxemburg	3	2	3	2	2	2
Denmark	13	11	10	6	10	10
France	21	16	19	29	26	26
Germany, FR	31	18	25	36	31	40
Ireland	2	2	2	3	3	3
Italy	5	4	5	5	5	6
Netherlands	50	48	51	63	68	67
Portugal	2	1	2	2	2	2
Spain	9	8	10	10	10	10
Sweden	3	3	4	4	5	2
Switzerland	0	0	3	6	0	0
UK	87	82	84	83	71	72
USSR	1	2	2	13	0	0
Japan	9	10	14	15	16	16
Malaysia	30	10	0	5	0	0
Indonesia	9	30	32	47	39	39
China	19	19	20	20	21	22
Philippines	0	0	1	1	2	3
Singapore	0	1	0	0	0	0
Benin	23	29	23	20	21	23
Cameroon	16	17	21	19	22	20
Ghana	15	14	10	10	8	8
Guinea	11	14	13	11	12	12
Ivory Coast	6	0	5	0	1	0
Liberia	2	1	0	0	0	0
Morocco	1	1	1	1	1	1
Nigeria	20	20	20	16	35	27
Senegal	2	2	2	2	2	2
Sierra Leone	2	6	3	5	4	6
South Africa	4	6	8	9	10	10
Zaire	11	10	2	4	8	8
Total	501	467	498	560	535	544

Notes : 1) All data are shown on a calendar year basis. This Table presents, for the first time, the FAS data base on palm kernel oil. The Table summarizes supply and utilization for all the major producing and consuming countries as well as for many of the minor producing countries in Asia and Africa. Data for 1980 and 1981 remain preliminary. Data for 1982 are forecasts.

2) World exports will not equal imports as not all trading countries have been identified.

Source: Counselor and Attache Reports, official statistics; Foreign Agricultural Service, Oilseeds and Products, June 1982

Appendix Table 20 Volume of Exports and Export Value of Copra

(MT, US$1,000)

	Philippines	Papua New Guinea	Malaysia	Indonesia	Singapore	Solomon Is.	Vanuatu	Samoa	Mozambique	Pacific Ocean countries (Trust Territory)	World total
Volume of Exports											
1966	910,700	89,263	39,722	175,000	6,842	20,670		14,242	33,919	11,284	1,460,816
1967	763,900	75,310	16,452	140,000	11,611	24,826		7,524	42,948	11,076	1,240,395
1968	664,900	76,706	18,871	217,000	20,516	17,493		12,826	46,776	9,100	1,207,746
1969	556,200	95,246	18,741	157,000	12,980	23,840		14,783	41,135	12,772	1,063,920
1970	425,200	85,601	15,468	185,140	14,130	21,432		9,773	45,096	14,232	915,741
1971	652,345	92,000	31,736	77,465	9,497	26,612		18,066	46,638	13,000	1,066,506
1972	982,386	87,515	32,710	42,392	5,636	20,910		19,022	43,938	13,000	1,355,179
1973	734,431	79,810	12,292	44,608	3,393	15,432		14,170	48,243	13,000	1,043,096
1974	267,697	73,568	10,645	1,300	2,304	21,785		12,534	41,879	13,000	527,314
1975	761,147	95,455	27,157	33,035	9,082	27,477		19,752	30,540	7,000	1,085,892
1976	822,736	92,764	31,714	3,940	17,643	23,015		12,100	41,105	7,600	1,146,938
1977	634,636	82,542	33,222	225	14,116	26,915		18,061	36,500	5,400	941,336
1978	365,241	85,348	36,600	-	41,647	26,103	44,878	13,316	17,000	3,722	677,492
1979	144,743	97,728	29,500	-	17,529	34,430	39,821	16,943	20,000	3,000	430,774
1980	121,452	87,767	36,900	35,845	30,882	28,821	26,732	25,339	16,000	8,000	440,778
Export Value											
1966	152,178	16,014	6,011	22,300	1,105	3,390		2,285	5,863	1,685	237,259
1967	127,495	11,193	2,282	16,700	1,876	4,064		1,290	6,658	1,850	198,129
1968	127,727	15,616	2,824	42,850	4,017	4,060		2,613	9,639	1,700	236,425
1969	94,943	16,581	2,711	23,500	2,047	3,887		2,499	6,889	2,199	178,184
1970	83,117	14,941	2,288	30,314	2,732	4,069		1,899	8,308	2,683	169,171
1971	107,773	17,000	4,401	12,448	1,740	4,368		2,840	8,220	1,640	177,526
1972	113,375	11,035	3,686	4,349	883	2,144		2,041	4,836	1,300	159,417
1973	165,764	10,508	2,801	5,249	835	3,986		2,687	9,078	947	219,394
1974	139,784	34,916	4,730	90	1,431	12,887		7,681	21,037	4,400	267,503
1975	172,318	39,483	5,503	3,292	2,134	6,106		4,129	6,417	1,617	257,361
1976	149,722	14,670	6,584	348	3,637	4,452		2,370	7,051	1,600	210,163
1977	200,525	22,103	11,443	20	5,493	8,859		5,855	8,804	1,796	293,569
1978	135,684	26,619	13,600	-	17,476	8,995	13,468	4,802	5,100	1,381	243,769
1979	89,128	47,318	15,200	-	11,679	18,997	19,463	9,790	8,000	1,500	236,752
1980	47,253	47,411	13,000	18,081	12,844	12,578	8,680	9,152	5,200	3,600	187,820

Source: FAO, Trade Yearbook, 1980

Appendix Table 21 World Exports of Copra by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
Philippines	112p	123	145	380	560	867	833	310	728	968	711
Papua New Guinea	96*	95	91	92	88	86	92	90	75r	100	90
Vanuatu	37*	27	40								
Malaysia	37*	47	32	40	38	40	31	11	14	37	NA
Solomon Is.	34*	29	34	26	27	23	28	22	15	21	27
Singapore	29*	31	18	42	14	18					
Mozambique	7*	12*	19*	17*	37	41	31	42	48	44	47
Others or other specified countries	61	100	79	106	112	115	136	102	141	172	286
World total or total of specified countries	412	463	457	703	875	1,189	1,149	576	1,022	1,342	1,114

* Estimate

Source: Oil World

Appendix Table 22 Volume of Imports and Import Value for Copra

(MT, US$1,000)

	Japan	France	Germany, FR	Netherlands	Singapore	India	Sweden	Malaysia	Portugal	USSR	World total
Volume of Imports											
1966	107,612	96,692	288,969	167,696	26,654	33,858	71,854	12,627	13,211	5,600	1,446,513
1967	112,059	85,880	237,891	125,910	15,431	23,705	67,145	4,145	11,287	3,000	1,246,007
1968	126,066	80,174	157,118	141,658	16,624	17,829	44,964	7,182	14,680	5,200	1,141,508
1969	108,751	63,244	177,251	123,629	20,627	22,324	36,991	6,487	11,581	4,000	1,111,965
1970	126,939	54,500	150,608	77,866	17,159	16,093	38,817	6,610	10,870	1,000	863,543
1971	122,396	61,006	275,512	54,863	33,470	8,134	49,028	18,629	21,655	3,000	1,063,277
1972	124,450	50,418	440,893	84,926	36,070	8,941	45,215	21,650	15,613	35,300	1,308,808
1973	134,233	46,802	273,070	106,862	15,023	1,274	46,980	2,216	16,636	27,800	1,060,667
1974	86,351	48,903	76,320	107,500	11,404	47	29,727	2,827	8,962	29,010	544,581
1975	89,866	64,041	413,142	166,691	27,079		38,505	16,778	11,096	29,042	1,033,188
1976	110,856	71,582	525,183	148,455	43,718	2,581	38,559	20,023	16,508	9,816	1,199,709
1977	97,785	61,074	351,317	74,649	40,784	6,284	41,649	24,165	25,870	19,893	903,689
1978	90,364	52,122	210,985	83,082	73,330	39,803	40,597	23,200	24,788	9,783	788,945
1979	55,659	56,381	53,890	57,762	36,124	14,500	20,188	16,900	18,900	10,349	450,474
1980	64,725	53,887	53,169	46,254	45,554	23,000	21,937	18,000	16,930	15,272	475,639
Import Value											
1966	19,391	18,693	56,723	32,243	4,319	7,203	14,575	1,501	2,576	1,351	274,932
1967	20,167	15,552	43,170	22,142	2,459	5,015	12,273	501	1,893	624	220,772
1968	27,188	18,242	36,893	31,231	2,970	4,573	10,856	933	3,211	1,369	252,799
1969	20,277	12,210	34,447	23,771	3,470	4,679	7,299	839	2,125	940	208,511
1970	26,782	11,787	33,041	17,120	3,065	3,892	8,472	852	2,140	271	180,596
1971	22,849	12,062	56,410	11,107	5,467	1,812	10,559	2,522	4,309	739	207,590
1972	16,412	7,636	66,828	12,916	4,630	1,671	7,350	2,464	2,243	6,356	191,884
1973	32,283	11,562	59,866	24,788	3,574	225	10,390	380	3,341	6,029	238,915
1974	52,973	31,048	47,380	65,198	5,738	15	20,587	1,110	4,312	17,298	329,124
1975	23,664	21,372	126,892	53,319	6,155		13,987	2,891	4,811	14,221	329,705
1976	24,306	17,130	114,563	33,516	9,686	798	8,980	3,196	3,589	2,108	269,123
1977	38,967	24,096	132,595	27,087	14,276	2,533	16,230	6,249	11,116	7,436	344,394
1978	38,890	22,874	85,925	33,918	28,230	18,835	17,990	7,000	10,843	3,544	326,469
1979	35,972	37,985	36,823	39,384	20,091	9,100	14,351	7,600	12,000	6,870	289,793
1980	31,361	26-511	30,195	24,196	16,918	12,700	11,298	5,000	9,300	9,062	238,620

Source: FAO, Trade Yearbook, 1980

Appendix Table 23 World Imports of Copra by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
Germany, FR	65*	53	54	211	351	525	413	76	273	441	276
Japan	74*	65	56	90	98	111	90	86	134	124	122
Netherlands	3*	46	58	83	75	149	167	108	107	85	55
France	16*	53	56	52	61	72	64	49	47	50	61
Singapore	40*	46	36	73	41	44	27	11	15	36	34
Sweden	24*	22	20	40	42	39	39	30	47	45	47
Portugal	25*	19	26	25	26	7	11	9	17	16	22
Malaysia	17*	29	17	23	27	33					
Others or other specified countries	121	144	156	201	206	233	231	188	435	517	459
World total or total of specified countries	385	477	479	799	926	1,221	1,042	557	1,075	1,314	1,074

* Estimate

Source: Oil World

Appendix Table 24 Volume of Exports and Export Value of Coconut Oil

(MT, US$1,000)

	Philippines	Malaysia	Indonesia	Singapore	Papua New Guinea	Netherlands	USA	Fiji	French Polynesia	Ivory Coast	World total
Volume of Exports											
1966	313,100	28,384	309	28,341	22,251	34,894	3,862	14,701		16	543,183
1967	234,900	32,654	273	26,478	23,553	33,545	5,057	14,387		1,431	473,485
1968	269,800	42,834	17,416	51,157	24,484	42,269	2,611	17,440	1,818	1,953	573,173
1969	214,500	29,650	4,237	34,018	20,893	44,374	3,755	17,406	2,637	1,513	481,905
1970	338,000	46,596	5,823	38,050	21,669	31,891	5,162	19,005	3,157	1,400	617,030
1971	397,050	43,223	805	36,074	27,330	24,329	9,696	16,865	2,189	210	713,571
1972	461,387	28,028	34,248	31,353	26,500	34,078	5,641	15,241	2,062	12	866,527
1973	430,486	30,677	16,530	28,804	27,715	48,346	11,172	18,242	3,650	1,425	736,849
1974	415,742	46,394		23,694	26,807	50,977	5,080	14,225	4,887	996	667,112
1975	614,387	38,362	26,668	25,634	26,565	66,650	8,261	16,057	4,068	7	1,042,514
1976	862,497	34,484	13,267	33,192	27,992	86,851	26,105	14,580	4,522	460	1,373,958
1977	769,630	27,138		39,350	27,257	53,393	17,210	17,551	4,984	485	1,095,672
1978	1,016,998	22,000		37,319	30,008	47,303	8,972	17,300	5,946	6,330	1,329,251
1979	803,483	61,800	20,708	41,982	29,600	31,420	5,371	15,238	8,692	10,377	1,136,560
1980	917,607	62,860	40,607	35,027	28,392	19,026	18,678	12,690	11,815	11,000	1,211,441
Export Value											
1966	75,740	7,158	55	7,811	6,568	10,061	1,130	3,633		1	142,238
1967	60,860	8,212	38	7,101	5,803	9,002	1,438	3,556		340	124,247
1968	82,500	13,278	5,000	14,939	7,701	14,945	933	5,465	6,844	720	181,174
1969	54,397	7,895	356	9,062	6,464	12,964	1,247	4,488	10,529	394	131,931
1970	98,000	13,947	1,577	12,019	6,497	10,875	1,891	5,890	10,753	345	189,428
1971	102,164	12,163	183	11,767	8,913	8,617	2,946	4,596	8,072	59	205,382
1972	79,159	5,999	4,792	8,134	6,909	10,111	1,506	2,863	10,748	3	179,779
1973	152,648	13,044	2,602	12,176	6,476	19,606	4,995	7,145	11,396	586	263,655
1974	380,732	44,170		22,954	20,297	58,894	2,919	13,342	7,225	765	619,483
1975	230,299	17,442	3,306	14,467	19,558	34,696	3,474	6,153	11,300	4	435,501
1976	298,713	13,934	1,636	15,015	9,233	35,355	10,139	5,109	13,342	130	495,859
1977	412,238	17,633		27,350	14,008	32,650	7,762	9,663	9,700	341	608,739
1978	620,572	14,570		27,445	14,897	33,990	5,361	8,580	8,017	4,196	829,704
1979	742,513	60,000	14,810	39,053	26,226	32,949	5,410	13,985	9,555	9,826	1,061,199
1980	566,848	46,730	22,810	28,993	26,164	17,788	13,220	7,990	7,336	8,800	793,847

Source: FAO, Trade Yearbook, 1980

Appendix Table 25 World Exports of Coconut Oil by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
Philippines	1,047	914	795	990	791	851	597	433	429	469	405
Malaysia	61	63	66	23	28	36	40	48	32	38	39**
Singapore	60*	35	42	37	39	33					
Papua New Guinea	29*	33	28	29	30	26	28	25r	29	27	28
Sri Lanka										80	69
Others or other specified countries	153	164	199	227	292	414	151	88	86	71	47
World total or total of specified countries	1,350	1,209	1,130	1,305	1,118	1,359	783	569	575	684	588

* Estimate
** Exports from West Malaysia only

Source: Oil World

Appendix Table 26 Volume of Imports and Import Value of Coconut Oil

(MT, US$1,000)

	USA	Germany, FR	USSR	Netherlands	UK	France	Italy	Japan	China	Belgium-Luxemburg	World total
Volume of Imports											
1966	269,028	35,504	16,900	1,611	35,940	10,550	18,679	4	7,515	8,553	549,959
1967	194,963	43,553	8,400	6,237	38,068	14,916	23,997	355	11,001	7,066	465,336
1968	220,759	60,950	31,900	8,803	47,635	13,319	23,889	8	10,474	10,920	551,929
1969	218,634	16,856	14,700	8,742	43,172	21,512	28,344	1,517	18,041	12,025	492,469
1970	260,454	31,628	23,200	8,409	48,116	18,703	19,795	2,125	20,851	18,874	594,258
1971	277,490	41,000	24,300	39,887	42,696	22,345	19,164	326	29,113	18,342	670,979
1972	341,463	44,534	13,200	73,766	50,304	47,266	21,265	10,741	37,429	22,317	849,447
1973	258,795	60,604	3,000	46,900	48,000	40,208	27,687	23,107	18,453	23,038	764,321
1974	249,418	74,509	6,100	10,031	33,223	16,832	19,984	17,414	19,568	8,604	624,583
1975	409,181	36,292	20,099	64,152	37,962	47,210	32,375	21,449	40,834	25,566	952,001
1976	572,912	54,272	70,908	105,205	70,619	71,502	44,303	30,569	30,868	36,627	1,414,938
1977	471,055	65,554	32,190	69,982	63,378	45,465	25,187	27,977	16,709	23,820	1,082,949
1978	480,247	111,197	50,553	62,866	65,612	53,079	42,811	28,722	19,575	21,396	1,269,232
1979	500,874	142,030	47,989	53,302	49,787	45,181	44,993	47,947	26,800	19,924	1,234,172
1980	401,406	155,705	79,331	55,965	46,439	43,095	40,678	34,566	32,500	28,517	1,142,300
Import Value											
1966	68,234	9,919	4,933	432	10,542	3,180	5,631	4	2,463	2,384	151,374
1967	48,531	11,244	2,318	1,759	10,610	4,231	6,670	126	3,607	1,917	125,712
1968	70,806	19,911	10,769	2,792	16,955	4,722	8,436	6	3,711	3,861	185,064
1969	55,225	4,761	4,800	2,436	13,087	6,518	8,582	416	5,967	3,457	139,731
1970	75,445	9,608	7,593	2,725	16,501	6,657	6,735	670	6,772	6,274	186,317
1971	74,972	12,280	8,319	12,010	14,829	7,522	6,496	109	9,641	6,454	205,115
1972	66,412	9,394	8,720	17,440	12,673	12,708	5,867	2,047	9,712	5,510	926,555
1973	81,665	19,314	1,380	15,063	17,302	14,080	10,541	9,225	6,286	8,242	263,609
1974	238,162	77,256	6,131	9,499	34,449	16,840	18,233	17,346	19,490	9,127	583,889
1975	207,653	16,460	11,313	26,587	17,505	25,156	19,056	8,587	20,876	12,709	487,461
1976	190,558	20,447	23,842	37,014	28,638	28,394	17,303	11,212	12,507	13,902	525,279
1977	251,081	36,502	24,255	39,647	40,607	28,578	15,605	16,142	9,100	13,932	622,002
1978	265,314	64,320	28,161	38,949	42,728	38,510	27,054	18,394	11,669	14,346	767,211
1979	443,117	134,897	46,040	49,420	53,033	50,112	45,783	48,674	21,400	19,674	1,147,637
1980	259,978	113,815	69,810	38,977	37,817	39,038	32,943	26,373	24,800	22,775	848,022

Source: FAO, Trade Yearbook, 1980

Appendix Table 27 World Imports of Coconut Oil by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
USA	471*	399	501	480	471	577	409	249	325	307	285
Germany, FR	204*	156	142	111	66	54	36	75	61	45	41
Netherlands	92*	56	53	63	70	105	64	10	47	74	40
UK	52*	46	50	66	63	71	38	34	48	50	43
USSR	67*	79	48	51	32	71	20	6	3	13	24
France	83*	43	45	53	46	72	47	17	40	47	30
Others or other specified countries	453	344	403	416	308	409	372	221	282	277	234
World total or total of specified countries	1,423	1,124	1,242	1,240	1,056	1,358	986	611	806	813	696

* Estimate

Source: Oil World

Appendix Table 28 Volume of Exports and Export Value of Palm Kernel

(MT, US$1,000)

	Nigeria	Indonesia	Guinea	Togo	Cameroon	Guinea-Bissau	Costa Rica	Papua New Guinea	Ivory Coast	Solomon Is.	World total
Volume of Exports											
1966	400,259	31,523	12,000	16,601	12,160	8,226			9,385		627,264
1967	165,111	38,625	15,124	13,000	17,300	10,242	304		10,137		366,354
1968	161,566	36,609	16,117	12,876	20,355	8,031			8,675		442,336
1969	178,951	42,700	15,000	18,800	16,079	9,339	663		12,563		438,189
1970	185,317	42,400	15,000	17,050	22,679	6,787	2,179		18,132		458,371
1971	241,676	48,608	13,500	16,500	19,251	7,298			19,312		490,737
1972	212,214	51,351	10,000	9,850	10,159	2,981	2,199	283	20,355		396,663
1973	137,454	39,229	13,000	6,458	12,349	4,702	4,732	200	23,900		302,593
1974	185,551	28,503	12,500	7,031	25,627	6,655	4,580	1,127	38,961		359,552
1975	171,423	31,978	8,723	6,250	12,264	4,425	3,576	1,416	29,060		308,924
1976	271,976	30,684	7,000	6,468	11,712	4,950	2,196	2,573	28,508		390,991
1977	181,710	26,352	10,603	3,949	10,212	6,325	3,233	3,407	16,487	1,300	282,733
1978	115,668	6,953	5,000	470	6,461	11,000	8,208	3,700	3,979	2,050	179,741
1979	72,300	20,817	7,000	6,000	10,000	8,000	4,000	4,500	4,456	2,045	162,077
1980	104,000*	42,900	11,000*	9,000*	6,785	6,048	4,553	4,234	3,500*	2,550	200,663
Export Value											
1966	62,806	3,791	1,700	2,203	1,735	866			1,116		92,016
1967	21,832	3,982	2,183	1,730	2,170	911	15		1,268		46,261
1968	28,484	4,555	4,129	2,321	3,242	885			1,482		70,074
1969	27,317	4,650	4,000	2,248	2,131	833	157		1,733		61,159
1970	30,435	5,500	3,000	2,362	3,270	544	287		2,353		68,845
1971	36,284	5,139	3,000	1,880	2,431	656			2,508		68,607
1972	23,816	3,744	2,000	747	1,133	210	146	19	2,314		42,345
1973	28,673	4,874	2,000	943	2,419	355	567	16	4,416		54,293
1974	69,430	9,546	4,000	2,787	9,498	602	1,596	302	16,172		130,699
1975	30,030	4,329	2,711	789	2,753	638	696	346	5,229		55,244
1976	43,376	3,739	2,000	888	1,985	607	335	250	4,933		62,690
1977	52,942	5,851	2,633	949	2,721	1,586	551	538	5,400	313	76,668
1978	29,090	1,558	1,500	125	1,758	4,000	1,961	620	1,890	482	47,312
1979	25,300	7,227	2,800	1,900	3,500	3,400	1,380	1,100	2,483	689	57,809
1980	31,000	11,200	3,700	2,600	2,096	1,933	996	1,383	2,000	462	59,368

* Unofficial figures

Source: FAO, Trade Yearbook, 1980

Appendix Table 29 World Exports of Palm Kernel by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
Nigeria	60*	101*	75*	116	182	272	171	185	138	212	242
Indonesia	22*	43	21	7	25	26	32	29	39	51	49
East Malaysia (Sabah and Sarawak)	34*	27	19	22	17	25	25	21	13	15	8
Togo	16*	9*	5	1	4	7	6	7	7	10	17
Sierra Leone	10*	6*	18r	2	5	18	29	25	37	51	52
Guinea-Bissau	12*	5*	9*	11*	6*	9*	4	8*	5	3	
Ivory Coast	17*	4*	5*	4	17	29	29	39	24	20	19
Cameroon								26	12	10	19
Guinea								11*	13*	10	14*
Others or other specified countries	30	39	38	49	35	25	37	26	35	33	70
World total or total of specified countries	201	234	190	192	291	411	333	377	323	415	490

* Estimate

Source: Oil World

Appendix Table 30 Volume of Imports and Import Value of Palm Kernel

(MT, US$1,000)

	UK	Germany, FR	Denmark	Malaysia	Japan	Netherlands	France	Portugal	USSR	Greece	World total
Volume of Imports											
1966	168,441	123,866	18,592	59	23,173	130,896	49,459	10,545	7,600	2,082	602,842
1967	98,367	68,760	9,054	17	19,232	65,719	46,781	6,525	4,500	1,307	372,817
1968	51,702	89,589	18,059	12	22,901	112,637	40,648	10,903	4,400	2,417	408,654
1969	43,985	69,380	22,487	14	30,351	149,845	43,716	9,176	2,800	3,358	441,683
1970	38,017	75,831	17,564	20	36,686	145,889	60,435	12,339	2,400	5,250	434,587
1971	48,560	69,096	25,606	14	38,851	214,732	40,918	17,469	4,000	6,626	493,265
1972	28,148	24,719	15,616	12,191	21,682	230,166	20,707	8,167	4,100	7,741	397,974
1973	34,875	34,037	16,625	18,212	12,177	121,546	18,248	8,791	2,000	6,166	300,192
1974	49,399	58,008	22,286	3,930	3,965	148,973	17,165	12,514	1,500		352,918
1975	74,659	41,917	17,881	4,170	6,689	97,858	12,481	7,496	3,980	831	293,384
1976	87,491	49,638	20,140	3,786	6,463	137,144	8,654	7,045	2,700	7,701	362,493
1977	56,066	72,677	24,575	2,877	11,089	84,916	12,040	4,933	2,317	3,435	310,658
1978	43,301	14,966	19,600	2,500	5,972	53,834	8,407	4,150	4,100	246	177,342
1979	69,574	4,727	14,480	2,500	9,177	33,015	8,827	3,300	1,500	2,376	159,713
1980	63,886	25,953	24,887	20,000*	14,827	9,459	6,829	5,758*	3,270*	1,100*	178,102
Import Value											
1966	27,846	20,060	2,892	15	3,416	21,159	8,041	1,592	1,178	380	97,223
1967	14,714	10,072	1,349	5	2,471	9,735	6,850	840	589	208	54,271
1968	8,738	16,474	3,244	2	3,480	18,597	7,466	1,831	758	449	70,234
1969	6,874	10,016	3,373	5	3,926	21,518	6,376	1,236	390	574	63,481
1970	6,241	12,007	2,935	15	5,249	23,473	9,777	1,793	344	952	68,786
1971	7,629	10,236	4,088	171	5,263	33,171	6,516	2,451	604	1,192	75,300
1972	3,375	2,763	1,847	1,447	2,083	27,950	2,511	851	628	932	47,116
1973	7,560	6,208	3,620	2,334	1,621	24,833	3,602	1,345	307	1,351	57,428
1974	23,126	23,494	10,667	1,230	1,564	61,145	7,605	4,238	395		145,532
1975	17,402	9,156	4,781	891	1,385	21,0555	3,043	2,389	1,697	154	67,674
1976	16,624	9,844	3,928	555	1,204	25,065	1,773	1,178	741	1,380	68,263
1977	17,462	24,932	8,105	664	3,138	28,028	3,955	1,368	612	1,145	100,370
1978	13,910	5,040	6,700	750	1,862	17,376	2,768	1,437	1,167	295	57,737
1979	32,753	2,023	7,230	1,000	3,943	15,647	4,259	1,600	458	1,247	74,360
1980	23,270	10,612	8,774	6,000	4,585	3,098	2,587	1,700	1,248	440	63,130

* Unofficial figures

Source: FAO, Trade Yearbook, 1980

Appendix Table 31 World Imports of Palm Kernel by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
UK	62*	64	70	43	56	88	75	49	35	28	49
West Malaysia	31*	41	12	11	17	26					
Germany, FR	2	26	5	15	73	50	42	58	34	25	69
Denmark	40	25	15	20	25	20	18	22	17	16	26
Japan	31*	41	12	6	11	7	7	4	12	22	39
Portugal	9*	10	6	4	5	7	8	13	9	8	18
Netherlands	12	10	33	54	85	137	98	149	122	230	215
France							13	17	18	20	41
Others or other specified countries	18	13	34	23	32	31	39	49	40	50	46
World total or total of specified countries	205	230	187	176	304	366	300	361	287	309	503

* Estimate

Source: Oil World

Appendix Table 32 Volume of Exports and Export Value of Palm Kernel Oil

(MT, US$1,000)

	Malaysia	Nigeria	Netherlands	Zaire	Ivory Coast	Singapore	Benin	Sierra Leone	Paraguay	Germany, FR	World total
Volume of Exports											
1966		32,599	18,002	32,273	181	519	11,698		4,245	1,710	114,797
1967		37,785	10,233	37,303	2,426	7	16,736	4,455	4,118	3,104	128,243
1968		27,262	19,427	36,970	1,864	385	22,715	1,460	6,047	2,789	137,998
1969	1	37,276	33,297	40,490	804	1,814	25,722		4,793	3,819	174,014
1970	2,268	32,761	31,487	45,111		6	18,600		6,642	3,171	164,799
1971	4,799	26,358	58,164	10,660	49	231	27,142		7,446	3,966	152,581
1972	49,049	33,582	50,120	37,968		4,908	17,800		4,923	1,975	208,918
1973	66,467	39,851	31,583	31,947		4,215	8,499	2,690	6,007	2,181	210,053
1974	92,336	38,462	40,438	33,599	279	6,725	301	8,544	6,873	8,191	304,820
1975	109,148	21,135	29,837	21,846	285	7,609	5,391	10,155	4,197	7,073	242,509
1976	123,609	13,362	31,830	19,824	19	9,613	6,012	9,150	6,353	10,201	258,403
1977	104,981	15,374	23,974	20,469		11,579	8,906	7,990	7,756	19,652	243,642
1978	129,556	39,300	21,052	16,150	13,853	5,803	3,752	9,250	5,241	5,847	265,643
1979	198,500	51,400	20,377	17,595	8,167	12,371	10,368	6,790	5,464	3,754	339,872
1980	219,000*	49,700*	20,614	19,000*	17,800*	13,470	9,489	7,826	4,311*	3,922	376,679
Export Value											
1966		9,215	5,188	8,254	5	106	2,423		1,362	550	31,332
1967		10,145	2,874	8,126	604	3	3,626	1,037	1,302	954	32,458
1968		9,313	6,829	11,378	530	65	7,204	342	2,108	1,048	45,542
1969		10,887	9,569	9,984	205	261	6,081		1,623	1,040	46,414
1970	684	11,660	9,900	12,609		4	5,527		2,235	939	50,820
1971	1,266	8,759	19,134	2,915	20	62	7,319		2,888	1,180	47,738
1972	10,716	8,392	12,999	7,630		1,055	4,160		1,929	549	49,821
1973	22,954	11,737	11,604	10,226		1,084	2,424	1,104	2,242	813	71,874
1974	68,472	34,240	38,050	27,216	262	4,248	84	6,294	3,966	7,069	251,698
1975	45,361	11,990	16,629	9,526	144	3,269	2,025	3,930	3,585	3,269	110,753
1976	47,731	5,065	14,721	8,377	6	4,042	2,114	3,510	3,589	4,202	103,931
1977	55,660	5,819	15,885	8,900		5,398	4,077	4,018	5,033	13,024	130,360
1978	80,002	21,200	15,655	8,358	8,556	3,494	2,366	5,532	3,891	3,764	162,850
1979	172,900	39,000	21,694	16,200	7,650	10,034	10,600	5,526	5,267	3,703	297,756
1980	139,000	34,000	18,051	14,000	14,000	9,756	8,462	4,321	3,400	3,368	257,390

* Unofficial figures

Source: FAO, Trade Yearbook, 1980

Appendix Table 33 World Exports of Palm Kernel Oil by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
West Malaysia	246*	215	199	130	105	124	109	92	67	50	5
Nigeria	45*	50*	51*	39*	15	13*	26	47	40	34	26
Netherlands	19	21	20	21	24	32					
Zaire	17*	19	18	17	15	23	29	34	33	37	45
Ivory coast	13*	18	8	14	-	-	0	0	1	1	
Indonesia				11*	20*	21*	25	13	11*	-	-
Benin						14*	12	17	22		
Sierra Leone						10	10	9	3	-	-
Dahomey										18	27
Others or other specified countries	49	54	51	39	65	34	12	24	12	11	12
World total or total of specified countries	389	377	347	271	244	271	223	236	189	151	115

* Estimate

Source: Oil World

Appendix Table 34 Volume of Imports and Import Value of Palm Kernel Oil

(MT, US$1,000)

	Netherlands	USA	UK	Germany, FR	France	Singapore	USSR	Spain	Canada	South Africa	World total
Volume of Imports											
1966	545	52,505	15,840	15,662	7,410			121	4,165	1,778	118,811
1967	2,584	44,225	34,861	10,018	8,365			117	5,498	2,527	131,138
1968	6,934	54,945	23,239	19,610	7,772			131	5,488	2,465	143,512
1969	13,7490	45,068	29,950	27,081	8,607	21		690	6,537	2,410	156,091
1970	19,527	37,437	33,370	22,609	9,880	46		1,252	5,162	2,010	159,081
1971	9,593	43,432	37,116	31,533	22,153	577		1,358	4,903	3,016	182,147
1972	1,989	45,822	58,662	22,021	30,205	2,244		735	5,750	3,253	206,485
1973	17,454	45,666	78,321	16,932	22,349	2,728		2,234	5,944	3,462	223,851
1974	23,634	69,848	56,616	33,585	18,051	4,272		3,436	4,377	3,829	254,729
1975	40,663	71,594	64,250	16,607	21,635	10,173		4,217	5,093	4,107	276,297
1976	35,286	67,993	64,906	20,980	15,369	9,186		8,362	10,349	3,091	274,035
1977	45,123	67,008	60,552	12,730	15,904	11,348		8,700	7,192	4,102	276,153
1978	59,123	57,947	63,522	16,679	14,507	6,711		8,032	7,252	6,365	275,455
1979	69,653	79,182	60,947	29,297	15,954	9,510	800	9,528	8,807	7,566	340,258
1980	97,260	83,816	52,945	32,105	18,416	12,389	12,100*	9,057	8,908	8,409	386,827
Import Value											
1966	159	5,484	4,508	4,558	2,197			55	1,223	478	35,507
1967	700	11,946	9,283	2,551	2,266			56	1,453	617	36,023
1968	2,219	19,405	7,512	6,657	2,698			55	1,882	767	49,272
1969	3,785	12,990	8,707	7,684	2,377	3		204	1,827	647	45,100
1970	6,178	12,125	11,088	6,746	3,224	18		425	1,816	566	51,489
1971	3,161	14,765	12,289	10,287	6,785	87		475	1,552	921	60,330
1972	495	12,080	14,822	5,700	7,424	508		192	1,269	735	53,756
1973	6,500	16,129	26,322	5,579	8,015	1,086		755	2,160	1,259	78,324
1974	20,726	55,938	49,255	29,253	15,901	3,323		2,986	4,563	2,361	218,562
1975	20,646	38,991	32,440	8,719	12,688	3,598		2,165	2,521	1,728	149,280
1976	13,505	29,566	25,071	8,750	5,962	3,485		3,197	3,218	1,347	111,394
1977	26,411	41,023	36,547	7,471	9,021	5,607		4,828	3,986	2,126	164,807
1978	36,800	37,688	40,598	11,208	9,818	4,156		5,179	4,724	3,962	178,836
1979	65,959	70,854	60,159	27,505	15,770	8,040	750	8,475	7,841	7,408	318,839
1980	69,945	65,902	38,913	23,313	13,727	7,829	9,100	7,554	6,226	6,557	290,646

* Estimate

Source: FAO, Trade Yearbook, 1980

Appendix Table 35 World Imports of Palm Kernel Oil by Countries

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971
Netherlands	79	97	70	59	45	35	41	24	18	2	10
USA	69	83	79	58	67	68	72	70	46	46	43
UK	54*	53	61	64	61	65	63	57	78	59	37
Germany, FR	28	32	29	17	13	21	17	34	17	22	32
France	12	18	16	15	16	15	22	18	22	30	24
India	20*	1*	0								
Canada						10	5	4	6	6	5
Singapore					11	9	10	n.a.	n.a.	2	1
Italy						12	12	12	10	16	14
Others or other specified countries	118	109	92	63	62	33	44	41	28	26	16
World total or total of specified countries	380	393	347	276	275	268	286	260	225	209	182

* Estimate

Note : n.a. not available

Source: Oil World

Appendix Table 36 Babassu Oil (Crude) Exports from Brazil

		Argentina	USA	Germany, FR	Netherlands	UK	Dominican Rep.	Japan	Bolivia	India	Total
1972	MT	2,040.0							32.5		2,072.5
	US$ 1,000	-							-		-
1973	MT	220.0	1,250.0								1,470.0
	US$ 1,000	83.4	836.5								919.9
1974	MT	1,849.0	16,930.1	230.0	20,407.3	835.9		30.0			40,282.1
	US$ 1,000	1,894.3	15,932.7	230.0	18,766.2	789.4		43.5			36,757.1
1975	MT	950.0									950.0
	US$ 1,000	681.1									-
1976	MT	369.0				0.2					369.2
	US$ 1,000	220.4				0.1					220.5
1977	MT	865.0			3,576.2		5.0				4,446.2
	US$ 1,000	625.8			2,342.8		3.8				2,972.4
1978	MT	730.0	483.3	260.0	7,745.0						9,218.3
	US$ 1,000	600.0	400.0	100.0	5,400.0						6,500.0
1979	MT	1,380.0	1,570.3	775.9	16,701.3						20,427.5
	US$ 1,000	1,500.0	1,300.0	600.0	14,200.0						17,600.0
1980	MT	1,259.3		262.5					5.0	1,050.0	2,576.8
	US$ 1,000	1,000.0		300.0					-	-	
1981	MT	582.2							6,000.0		588.2
	US$ 1,000	-							-		-

Source: Bank of Brazil and Carteira do Comercio Exterior (CACEX)

Appendix Table 37 Babassu Oil (Refined) Exports

(kg)

	Argentina	Surinam	Total
1974	9,936		9,936
1975		172,800	172,800
1979	4,860		4,860

Source: Bank of Brazil, Carteira do Comercio Exterior (CACEX)

Appendix Table 38 World Production, Exports and Export price of Selected Oilseeds

(1,000 MT)

	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969
World copra production	3,209	2,961	2,770	2,935	2,881	2,843	2,721	2,522	2,368	2,554	2,433	2,479	2,399
(oil equiv.)	(129)	(119)	(112)	(118)	(116)	(115)	(110)	(102)	(96)	(103)	(98)	(100)	
World copra & coconut oil exports (oil equiv.)		1,491	1,410	1,759	1,693	2,102	1,732	1,002	1,399	1,727	1,391	1,199	
		(124)	(118)	(147)	(141)	(175)	(144)	(84)	(117)	(144)	(116)	(100)	
World palm kernel production	851	824	758	628	659	645	617	608	529	540	550	530	484
(oil equiv.)	(161)	(155)	(143)	(118)	(124)	(122)	(116)	(115)	(100)	(102)	(104)	(100)	
World palm kernel & p.k. oil exports (oil equiv.)		467	413	347	372	434	382	467	346	387	373	371	371
		(126)	(111)	(94)	(100)	(117)	(103)	(126)	(93)	(104)	(101)	(100)	
World soybean production	15,829	14,557	16,957	14,496	14,123	11,279	12,466	10,291	11,279	9,354	8,726	8,376	8,141
(oil equiv.)	(189)	(174)	(202)	(173)	(169)	(135)	(149)	(123)	(135)	(112)	(104)	(100)	
World soybean & s.b. exports (oil equiv.)		8,035	7,534	6,937	5,705	5,392	4,328	4,648	3,865	3,585	3,553	3,392	2,346
		(237)	(222)	(202)	(168)	(159)	(128)	(137)	(114)	(106)	(105)	(100)	
Copra price (CIF NW Europe Philippine & Indonesian bulk)	379	453	673	471	402	275	256	670	348	142	190	225	
	(168)	(201)	(299)	(209)	(179)	(122)	(114)	(298)	(155)	(63)	(84)	(100)	
Palm kernel price (CIF UK Nigerian products)	317	345	500	364	326	230	207	472	260	115	145	167	
	(190)	(207)	(299)	(218)	(195)	(138)	(124)	(283)	(156)	(69)	(87)	(100)	
Soybean price (CIF Rotterdam U.S. products)	288	296	298	268	280	231	220	277	290	140	126	117	
	(246)	(253)	(255)	(229)	(239)	(197)	(188)	(237)	(248)	(120)	(108)	(100)	
Coconut oil price (CIF Rotterdam Philippine & Indonesian products)	570	674	985	683	578	418	393	998	513	215	299	346	
	(165)	(195)	(285)	(197)	(167)	(121)	(114)	(288)	(148)	(62)	(86)	(100)	
Palm kernel oil price (CIF Rotterdam Malaysian products)	588	670	968	703	609	433	409	1,046	477	249	336	369	
	(159)	(182)	(262)	(191)	(165)	(117)	(111)	(283)	(129)	(67)	(91)	(100)	
Palm kernel oil price (FOB Dutch ex-mill)													
Palm oil price (CIF NW Europe Sumatran/Malay products)	571	584	654	600	530	405	420	691	390	211	254	258	
	(221)	(226)	(253)	(233)	(205)	(157)	(163)	(268)	(151)	(82)	(98)	(100)	
Soybean oil price (FOB Decatur U.S. products)	464	519	608	567	523	414	560	790	465	270	323	307	
	(151)	(169)	(198)	(185)	(170)	(135)	(182)	(257)	(151)	(88)	(105)	(100)	
Soybean oil price (FOB Dutch ex-mill)	507	598	662	607	575	438	563	832	436	241	304	286	
	(177)	(209)	(231)	(212)	(201)	(153)	(197)	(291)	(152)	(89)	(105)	(100)	

Appendix Table 39 Short-term Projections of Copra Production and Coconut Oil Consumption

(1,000 MT)

	Developed countries					Developing countries						Centrally planned economies			World total
	North America	Western Europe	Oceania	Other	Total	Africa	Latin America	Near East	Far East	Other	Total	Asia Cent. Plan.	USSR & Eastern Europe	Total	
Consumption, in terms of oil															
1973	398	560	22	132	1,112	55	153	5	989	6	1,208	43	39	82	2,402
1980	496	588	22	107	1,213	90	170	17	1,285	13	1,575	57	35	92	2,880
1985	534	611	23	114	1,282	109	167	20	1,419	12	1,727	66	31	97	3,106
	(1.5)	(0.8)	(0.9)	(1.3)	(1.1)	(3.9)	(-0.4)	(3.3)	(2.0)	(-1.6)	(1.9)	(3.0)	(-2.4)	(1.1)	(1.6)
Copra production															
1973						152	202		3,080	262	3,696	32		32	3,728
1980						173	211		3,847	314	4,545	40		40	4,585
1985						187	195		4,188	327	4,897	46		46	4,943
						(1.6)	(-1.6)		(1.7)	(0.8)	(1.5)	(2.8)		(2.8)	(1.5)
Copra production, in terms of oil															
1973						97	129		1,940	170	2,336	21		21	2,357
1980						111	135		2,423	204	2,873	26		26	2,899
1985						120	125		2,638	213	3,096	30		30	3,126
						(1.6)	(1.5)		(1.7)	(0.9)	(1.5)	(2.9)		(2.9)	(1.5)
Potential Export Quantity															
1973	-398	-560	-22	-132	-1,112	42	-24	-5	951	164	1,128	-22	-39	-61	-45
1980	-496	-588	-22	-107	-1,213	21	-35	-17	1,138	191	1,298	-31	-35	-66	19
1985	-534	-611	-23	-114	-1,282	11	-42	-20	1,219	201	1,369	-36	-31	-67	20

Notes : 1) Figures in 1973 and 1980 are actual (FAO data).
2) Figures in parentheses are average growth rates from 1980 to 1985.

Source: The Study Team

Appendix Table 40 Short-term Projectons of Palm Kernel Production and Palm Kernel Oil Consumption

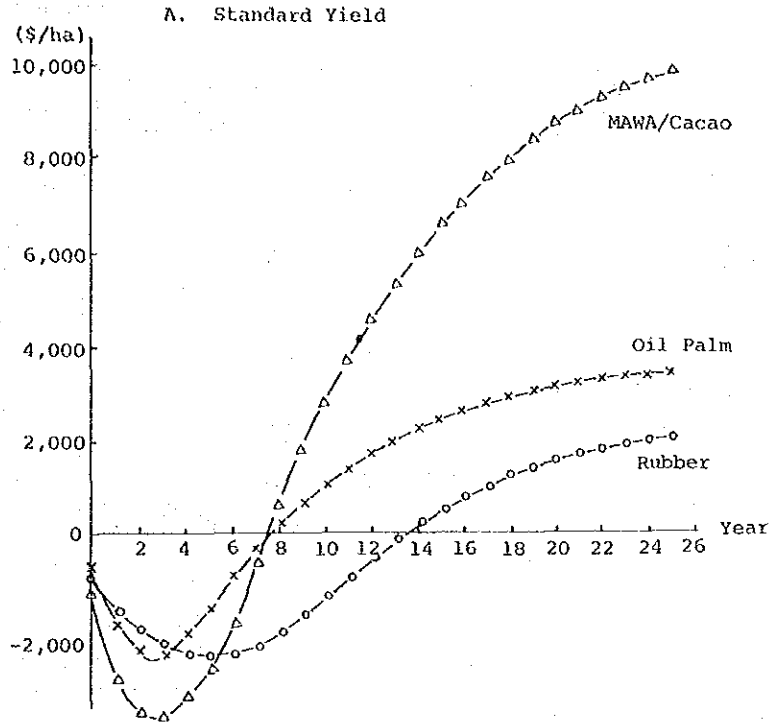
(1,000 MT)

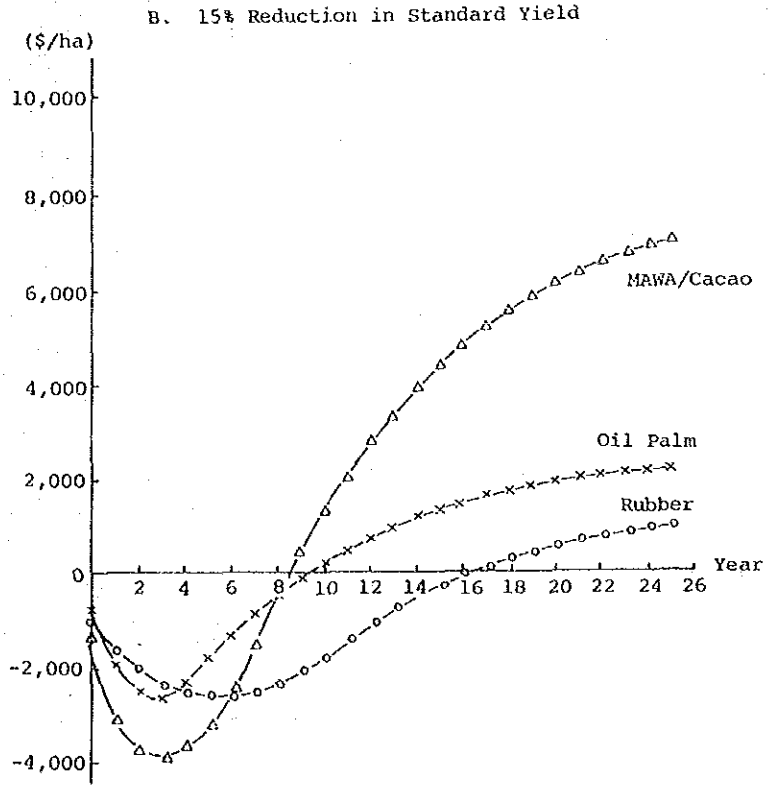
	Developed countries					Developing countries						Centrally planned economies			World total
	North America	Western Europe	Oceania	Other	Total	Africa	Latin America	Near East	Far East	Other	Total	Asia Cent. Plan.	USSR & Eastern Europe	Total	
Consumption, in terms of oil															
1973	51	230	0	11	292	81	127	0	21	3	232	21	4	25	549
1980	80	242	1	17	340	163	144	1	57	0	365	33	0	33	738
1985	93	244	1	18	356	215	160	2	74	0	451	42	0	42	849
	(3.1)	(0.2)	(0)	(1.1)	(0.9)	(5.7)	(2.1)	(14.8)	(5.4)		(4.3)	(4.9)	(0)	(4.9)	(2.7)
Copra production															
1973						616	281		233	6	1,136	38		38	1,174
1980						670	319		538	12	1,539	51		51	1,590
1985						663	345		723	16	1,747	62		62	1,809
						(-0.2)	(1.6)		(6.1)	(5.9)	(2.6)	(4.0)		(4.0)	(2.6)
Copra production, in terms of oil															
1973						277	132		105	3	517	19		19	536
1980						302	150		242	5	699	25		25	724
1985						298	162		325	7	792	30		30	822
						(-0.3)	(1.5)		(6.1)	(7.0)	(2.5)	(3.7)		(3.7)	(2.6)
Potential Export Quantity															
1973	-51	-230	0	-11	-292	196	5	0	84	0	285	-2	-4	-6	-13
1980	-80	-242	-1	-17	-340	139	6	-1	185	5	334	-8	0	-8	-14
1985	-93	-244	-1	-18	-356	83	2	-2	251	7	341	-12	0	-12	-27

Notes : 1) Figures in 1973 and 1980 are actual (FAO data).
2) Figures in parentheses are average growth rates from 1980 to 1985.

Source: The Study Team

Appendix Fig. 1 Estimates of Cumulative Profit and Loss





Appendix Fig. 1 (cont'd.)

Production Costs used in Profit Calculation

(US$/ha/year)

MAWA/Cacao

Cost item	Preparation period	Year 1	2	3	4	5	6-25
Land development	730	-	-	-	-	-	-
Cacao seedlings	-	480	-	-	-	-	-
MAWA seedlings	-	590	-	-	-	-	-
Provision of shade	200	75	25	-	-	-	-
Cacao fertilization	-	160	190	230	240	240	240
MAWA fertilization	-	80	115	165	200	250	270
Weeding	185	245	160	125	100	100	100
Prevention of damage by blight and insects							
CACAO	-	100	125	125	125	125	125
MAWA	-	150	125	125	75	50	50
Other	295	420	200	150	150	150	150
Total	1,410	2,300	940	920	870	915	935

Oil Palm

Cost item	Preparation period	Year 1	2	3	4-5	6-25
Land development	570	-	-	-	-	-
Seedlings	-	270	-	-	-	-
Shade crops	75	170	40	35	-	-
Fertilization	-	250	250	250	250	270
Weeding	185	400	270	150	85	65
Prevention of damage by blight and insects	-	50	25	25	25	25
Other	-	340	175	240	230	75
Total	830	1,480	760	700	590	435

Rubber

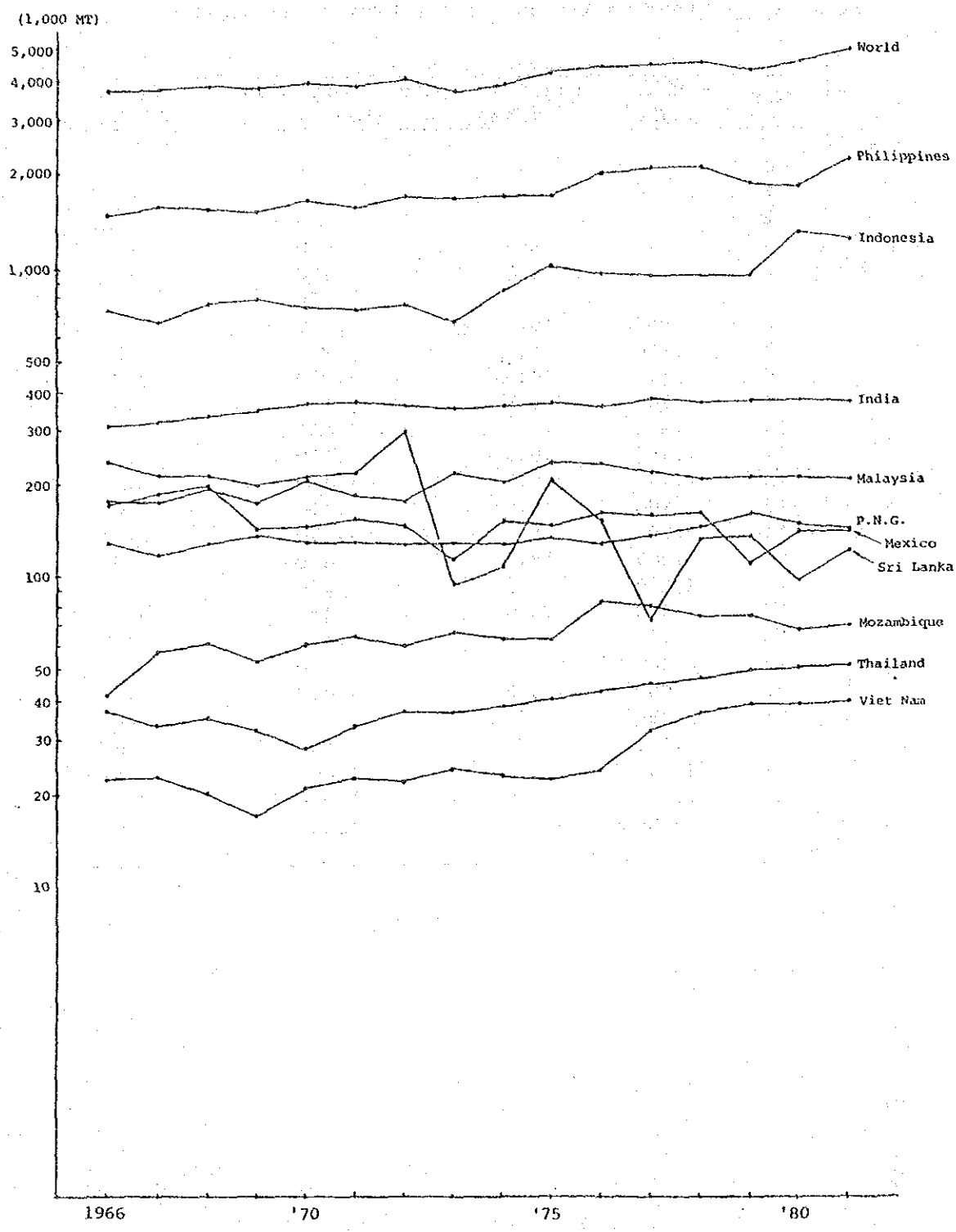
Cost item	Preparation period	Year 1	2	3	4	5	6-25
Land development	570	-	-	-	-	-	-
Seedlings	-	270	-	-	-	-	-
Shade crops	75	170	40	35	-	-	-
Fertilization	-	125	125	125	125	100	75
Weeding	150	350	250	185	100	85	45
Prevention of damage by blight and insects	-	25	25	50	50	25	10
Other	240	75	55	45	45	45	35
Total	1,035	1,010	495	440	320	255	165

Appendix Fig. 1 (cont'd.)

Standard Yields used in Profit Calculation

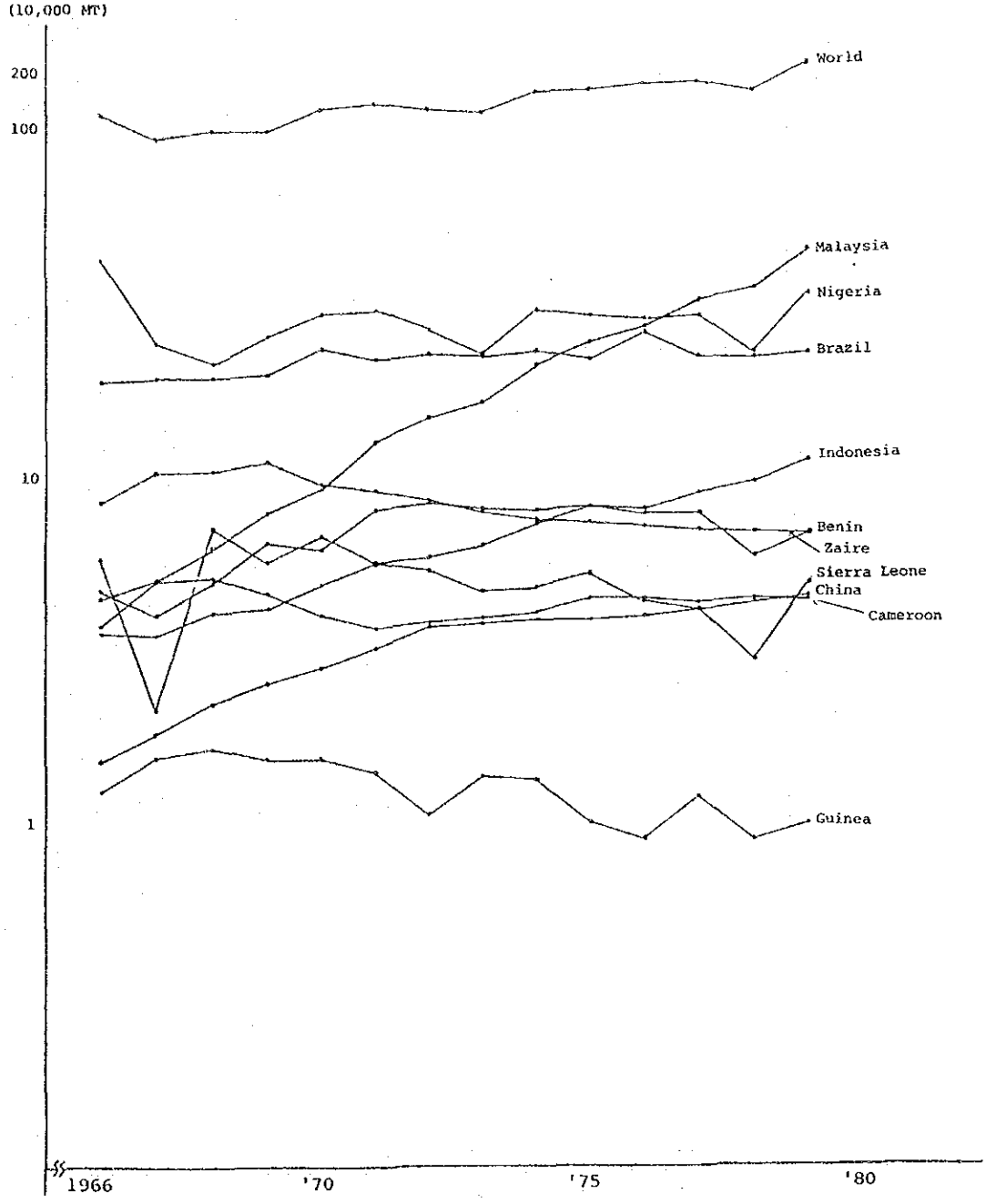
Year	Rubber (kg/ha)	Oil palm (MT/ha)	Cacao (dry bean) (kg/ha)	Copra (MT/ha)
0	-	-	-	-
1	-	-	-	-
2	-	-	-	-
3	-	6.5	400	-
4	-	15.0	750	-
5	-	18.5	750	0.8
6	850	19.5	1,100	1.8
7	1,100	20.0	1,250	2.5
8	1,450	20.0	1,350	3.0
9	1,700	19.5	1,450	3.0
10	1,800	19.5	1,450	3.0
11	2,150	19.0	1,450	3.0
12	2,150	19.0	1,450	3.0
13	2,100	18.5	1,450	3.0
14	2,000	18.5	1,450	3.0
15	2,000	18.5	1,450	3.0
16	2,250	18.0	1,450	3.0
17	2,150	18.0	1,450	3.0
18	2,100	17.5	1,450	3.0
19	2,000	17.0	1,450	3.0
20	1,950	16.5	1,450	3.0
21	2,250	16.0	1,450	3.0
22	2,150	16.0	1,400	3.0
23	2,100	15.5	1,400	3.0
24	2,000	15.5	1,350	3.0
25	1,950	15.0	1,350	3.0

Appendix Fig. 2 Copra Production



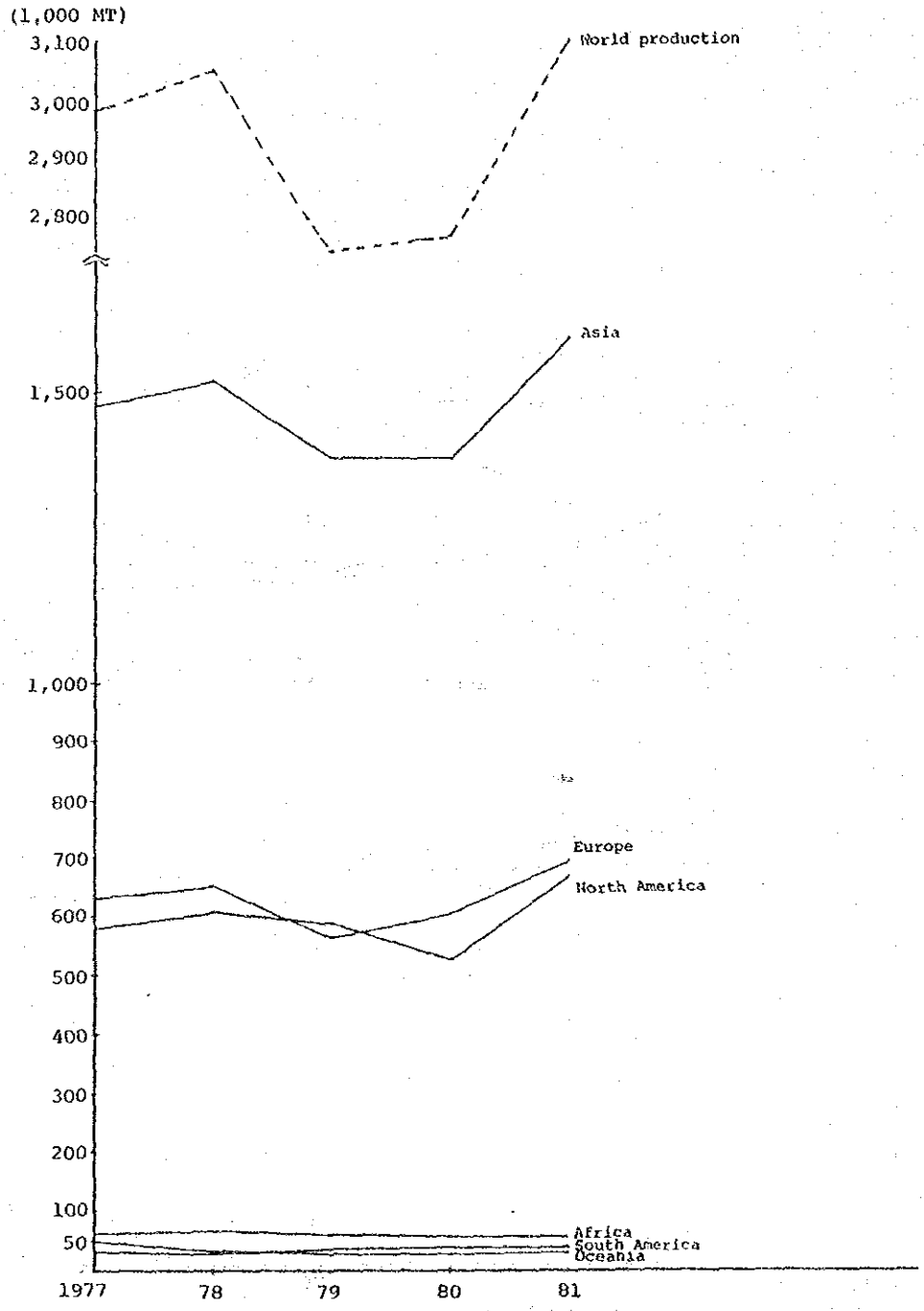
Source: FAO, Production Yearbook

Appendix Fig. 3 Palm Kernel Production



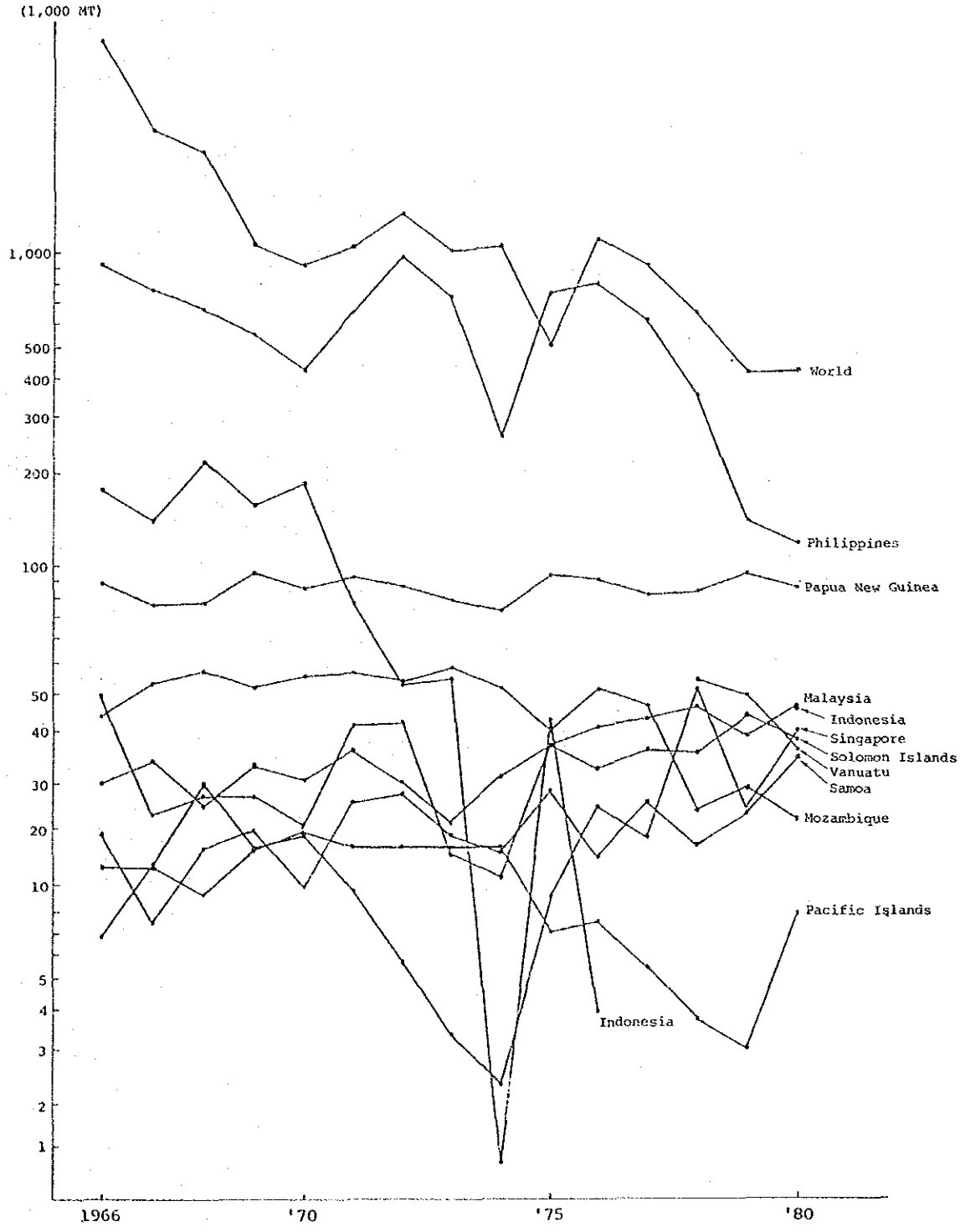
Source: FAO, Production Yearbook

Appendix Fig. 4 Estimated Coconut Oil Utilization by Regions



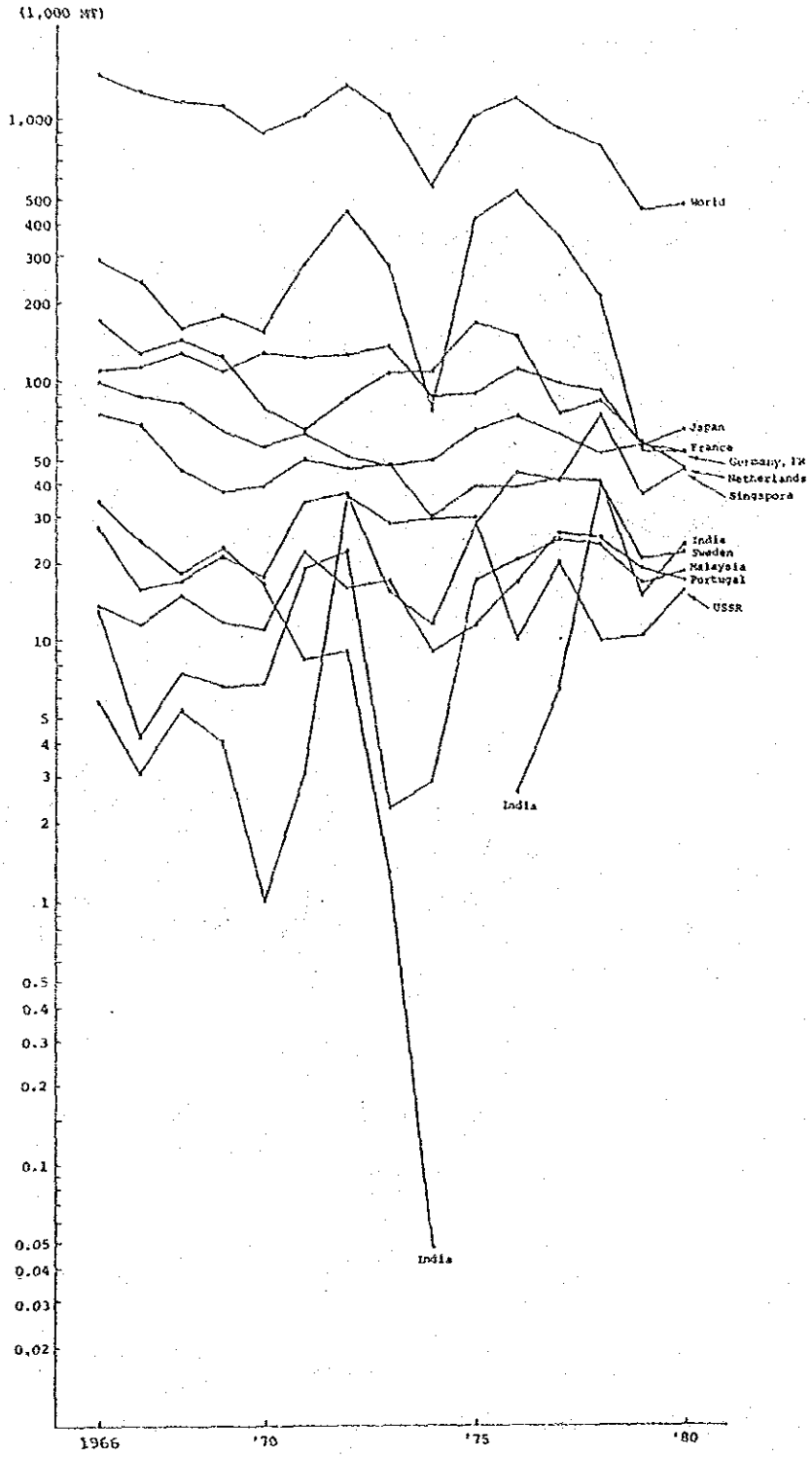
Source: USDA

Appendix Fig. 5 Quantity of Copra Exported



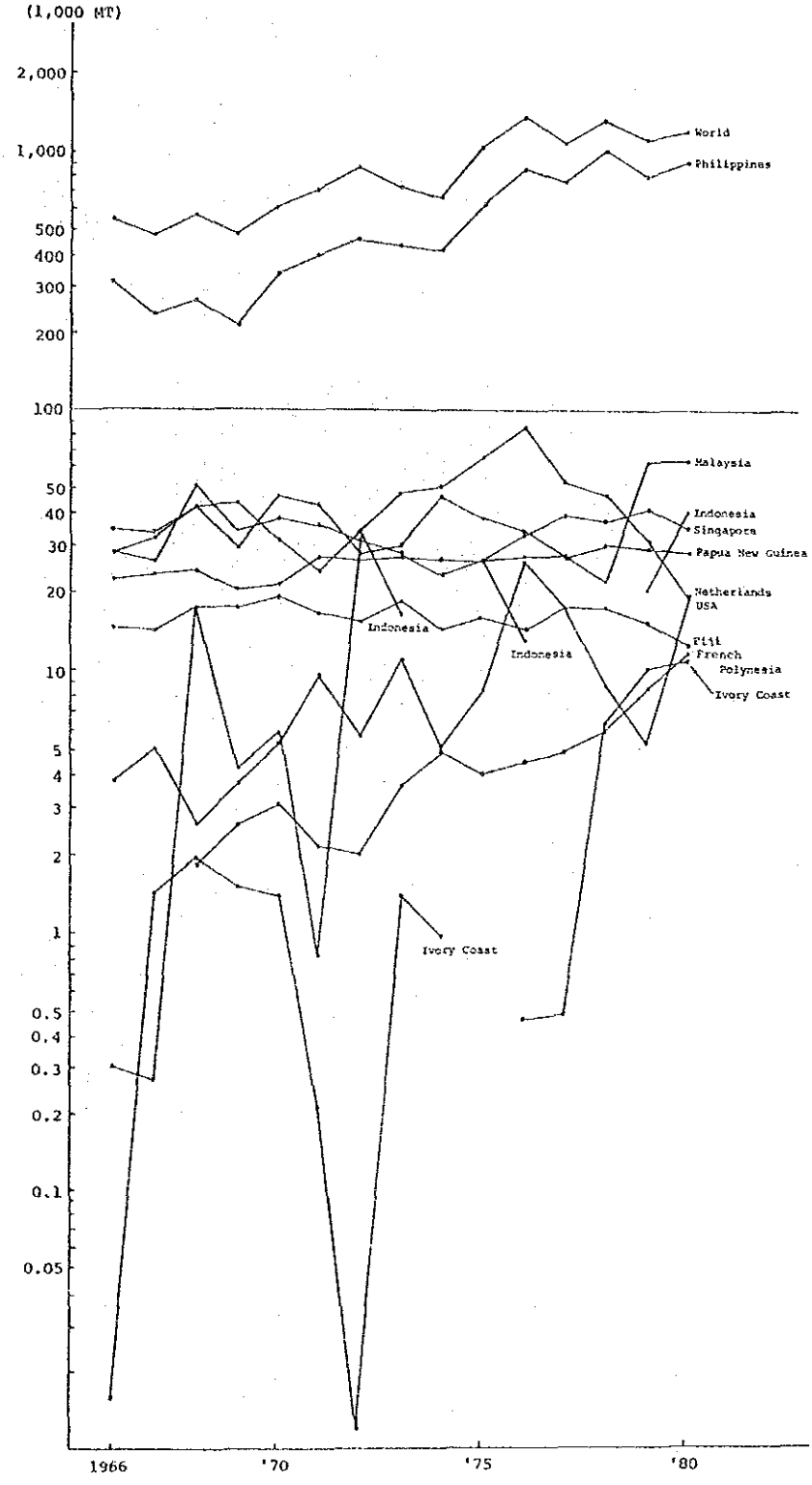
Source: FAO, Trade Yearbook

Appendix Fig. 6 Quantity of Copra Imported



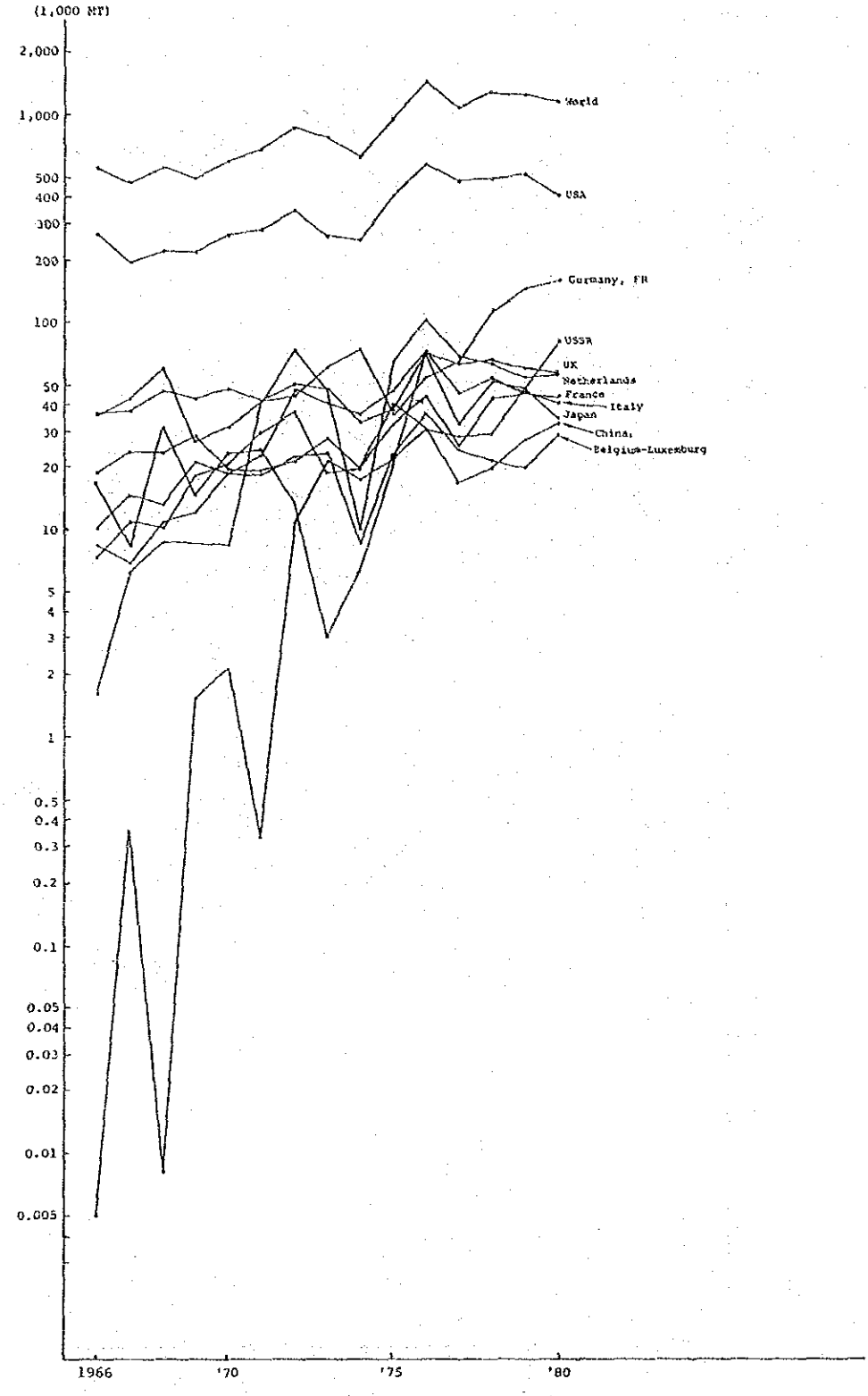
Source: FAO, Trade Yearbook

Appendix Fig. 7 Quantity of Coconut Exported



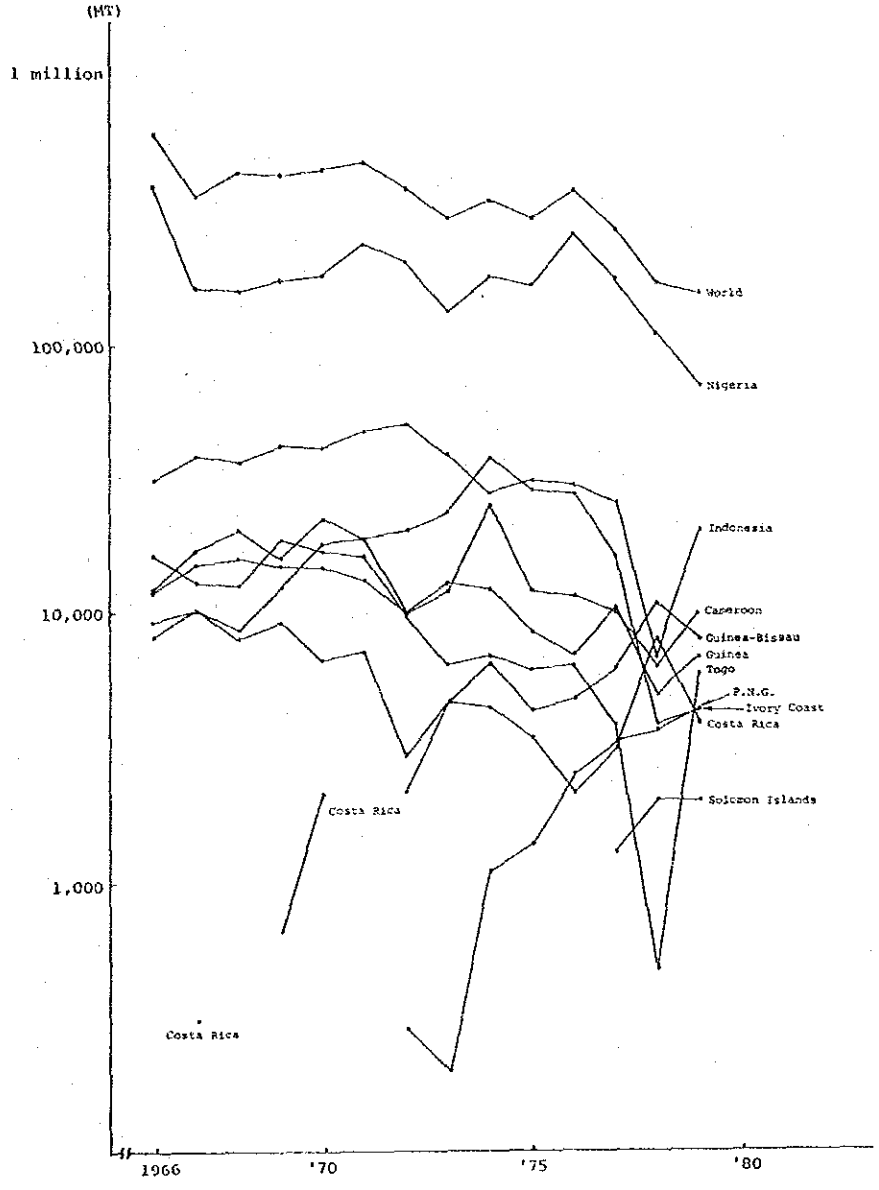
Source: FAO, Trade Yearbook

Appendix Fig. 8 Quantity of Coconut Oil Imported



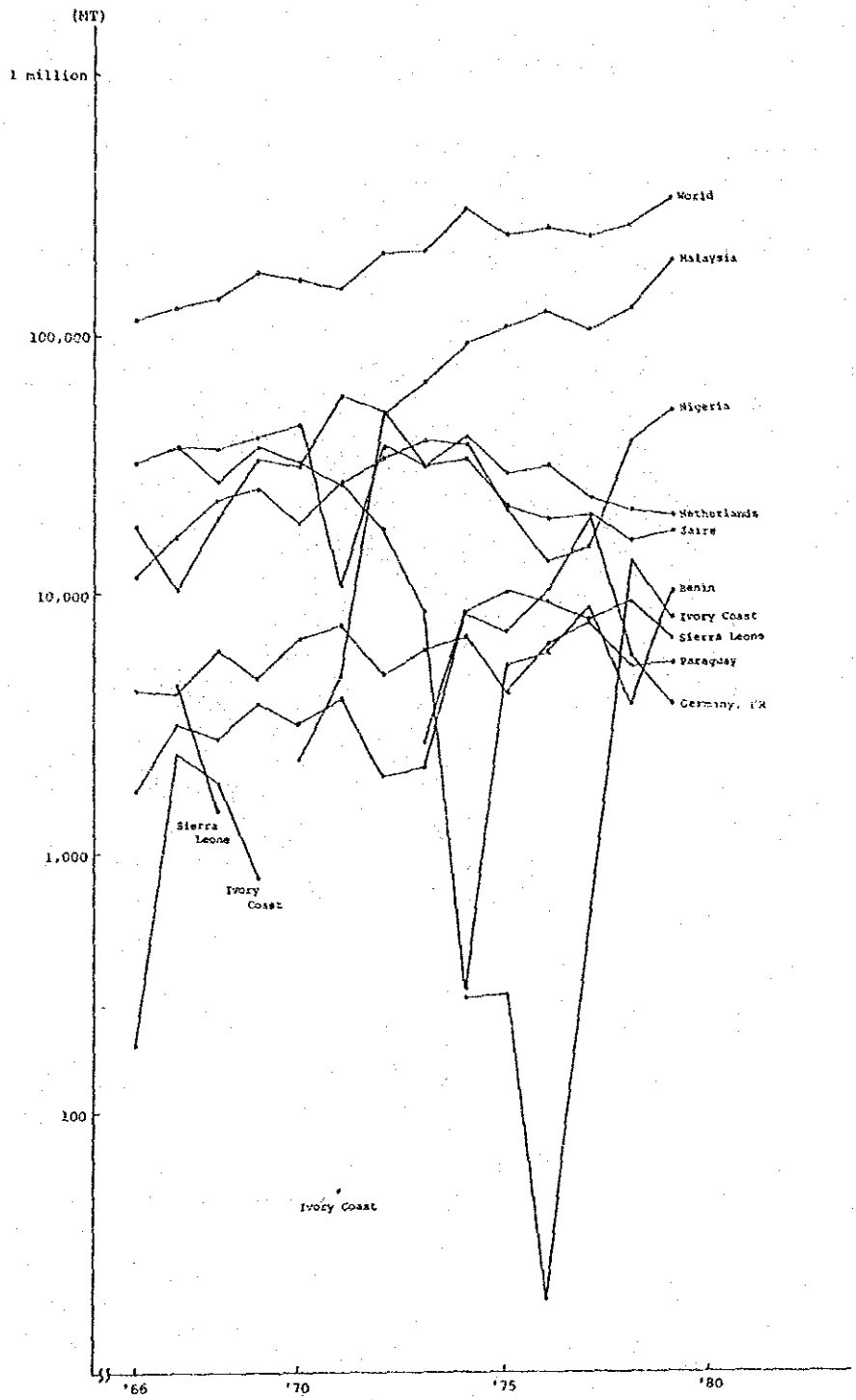
Source: FAO, Trade Yearbook

Appendix Fig. 9 Quantity of Palm Kernel Exported



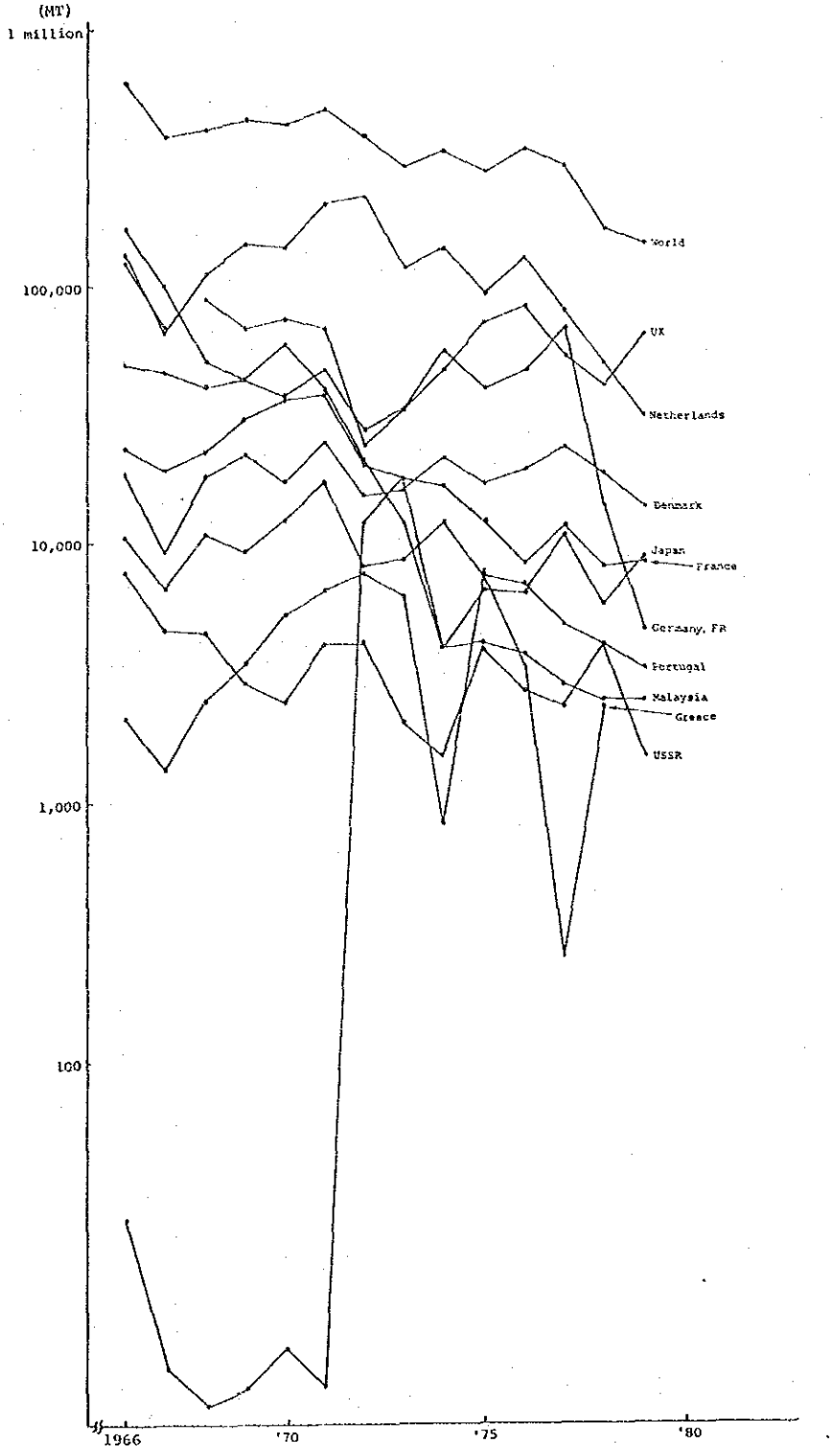
Source: FAO, Trade Yearbook

Appendix Fig. 10 Quantity of Palm Kernel Oil Exported



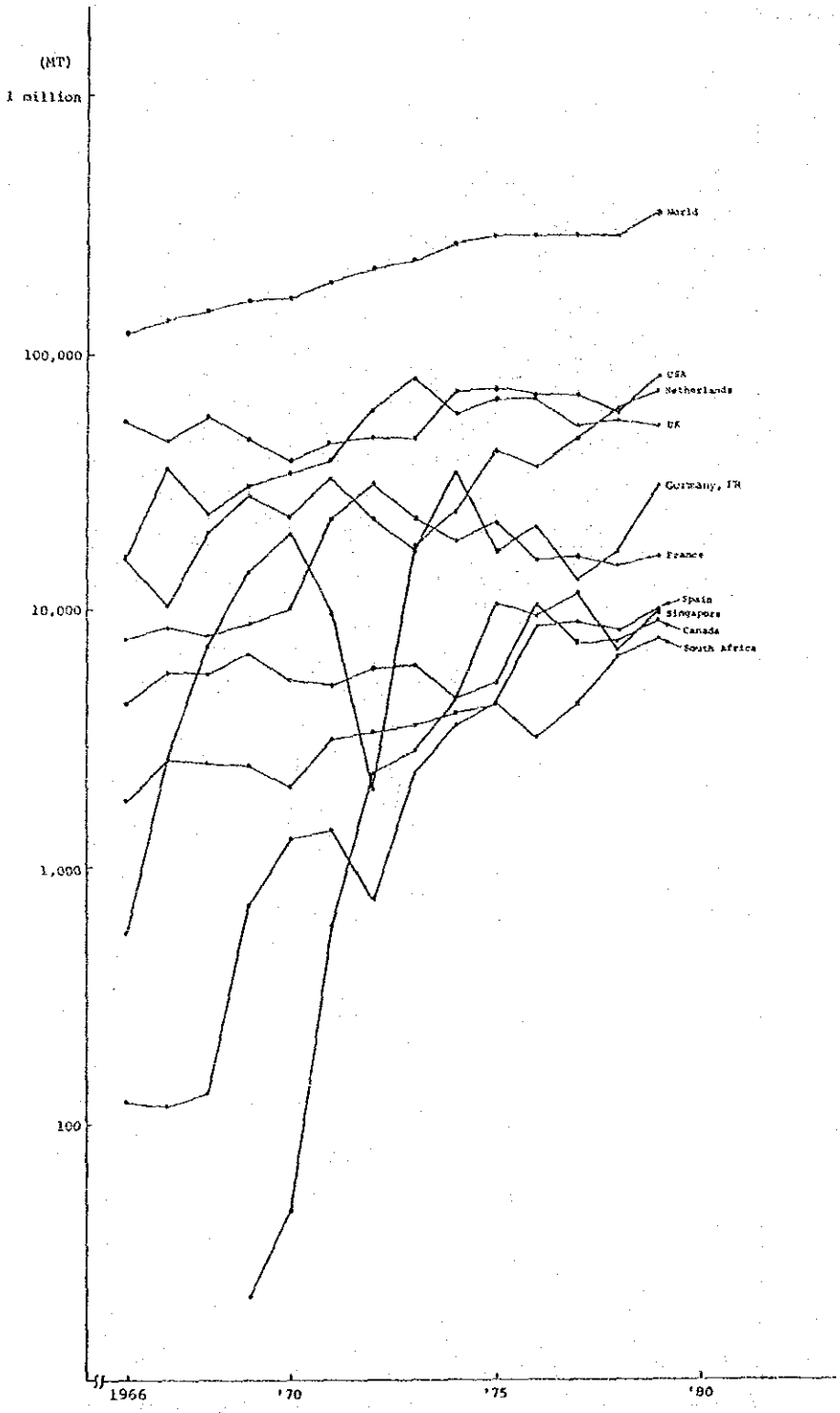
Source: FAO, Trade Yearbook

Appendix Fig. 11 Quantity of Palm Kernel Imported



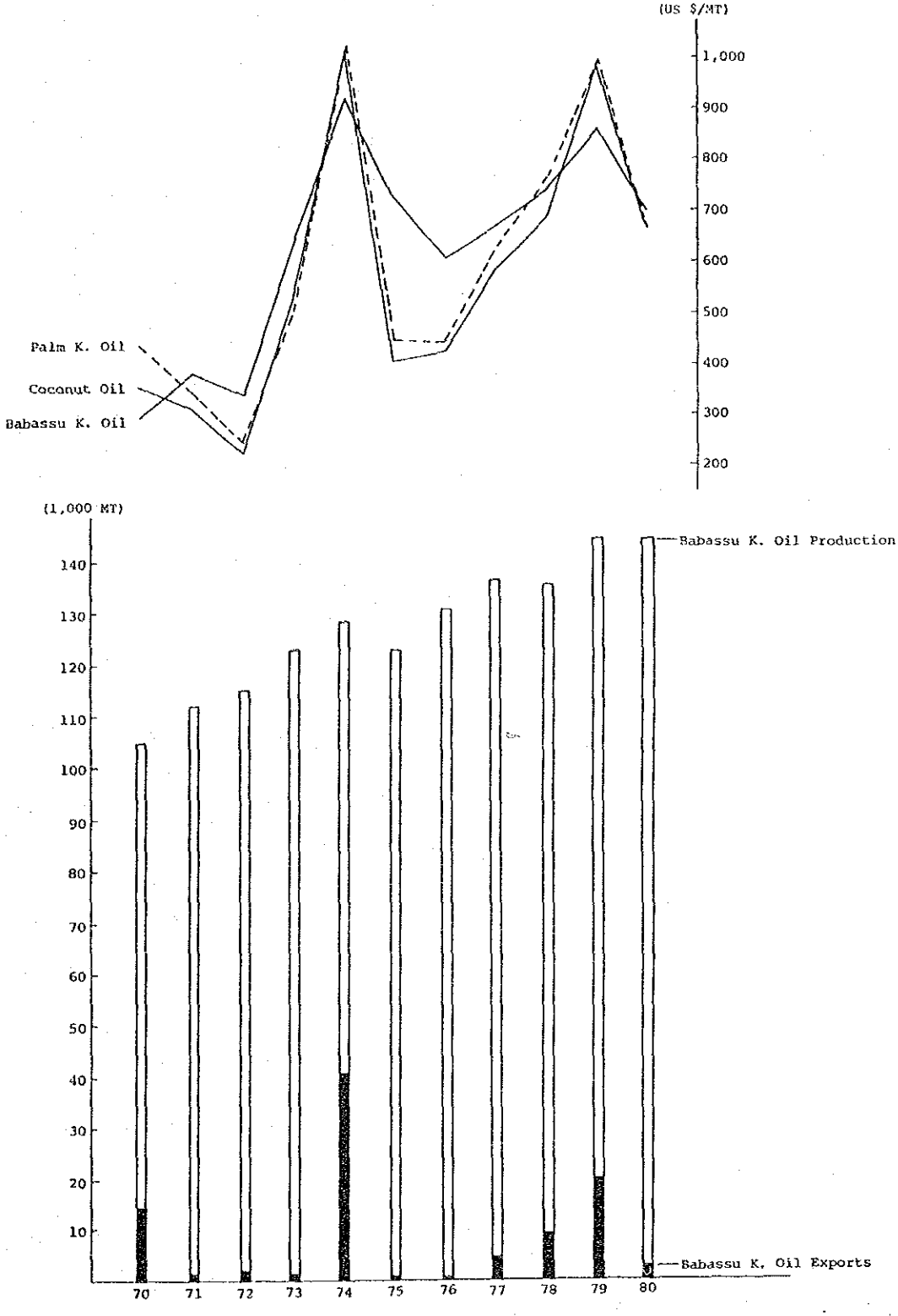
Source: FAO, Trade Yearbook

Appendix Fig. 12 Quantity of Palm Kernel Oil Imported



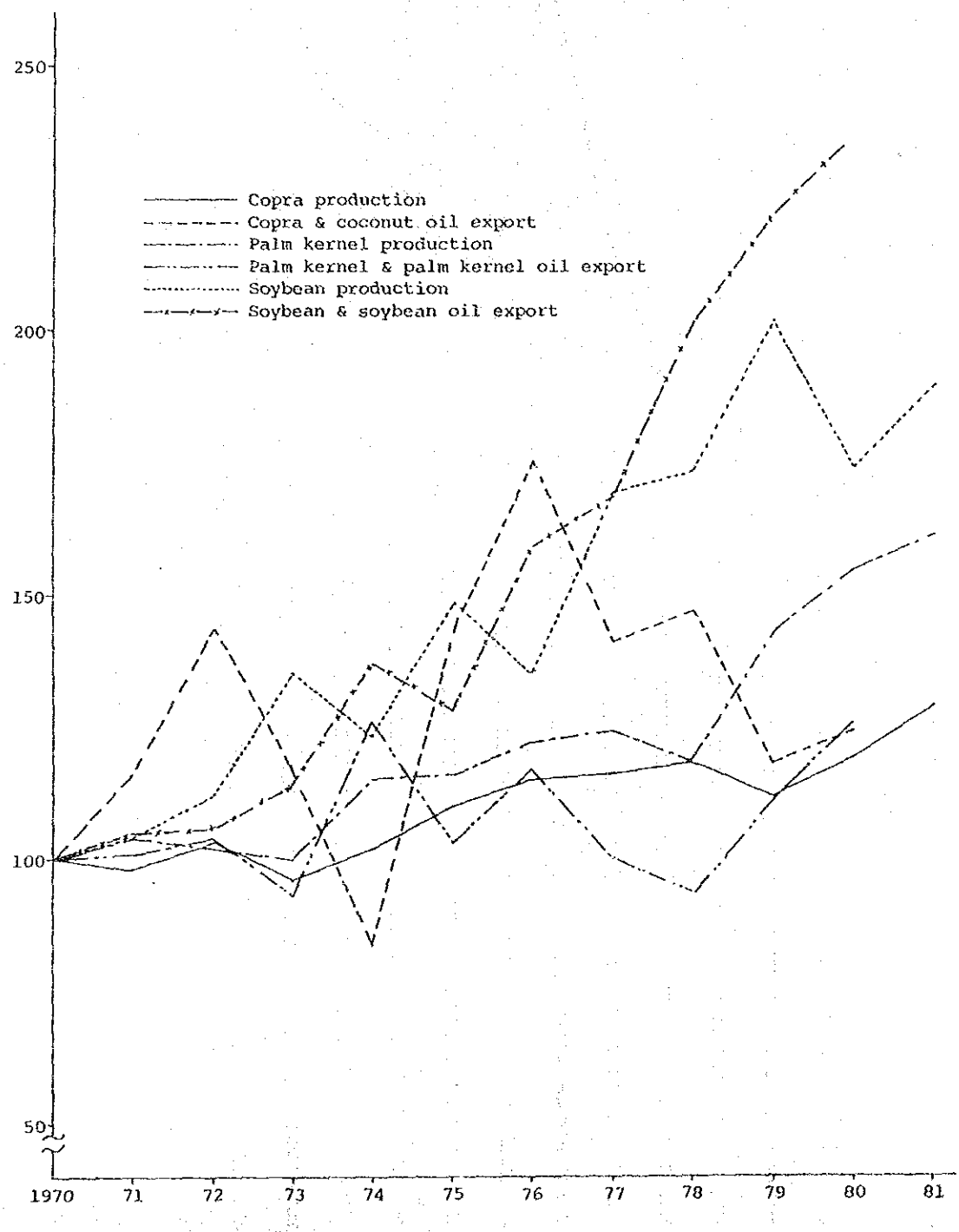
Source: FAO, Trade Yearbook

Appendix Fig. 13 Trend of Prices of Palm Kernel Oil, Coconut Oil and Babassu Kernel Oil



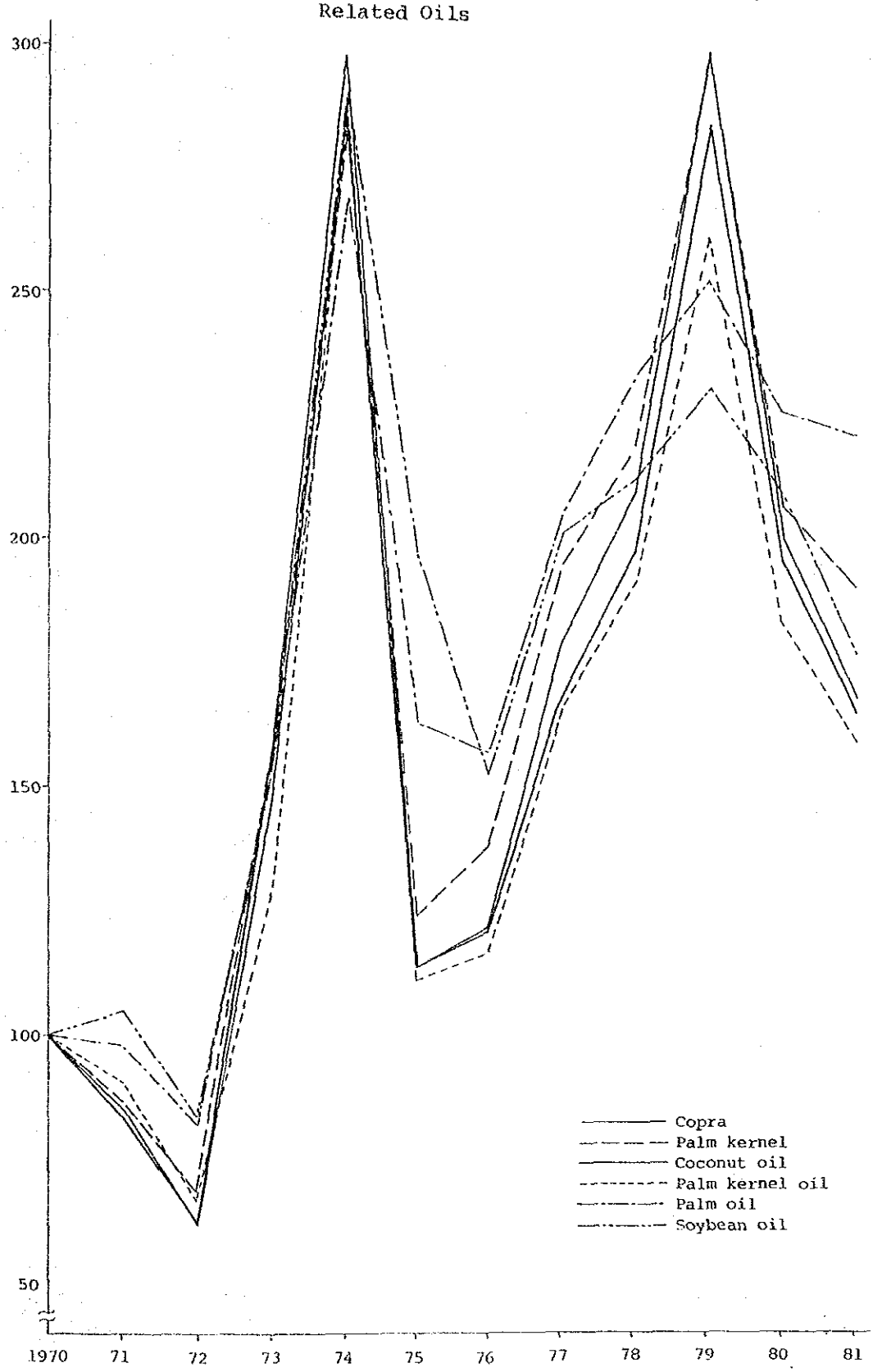
Source: Price - Oil World; Production - IBGE; Exports - CACEX

Appendix Fig. 14 World Production and Exports of Copra, Palm Kernel, and Soybean, and their Oils



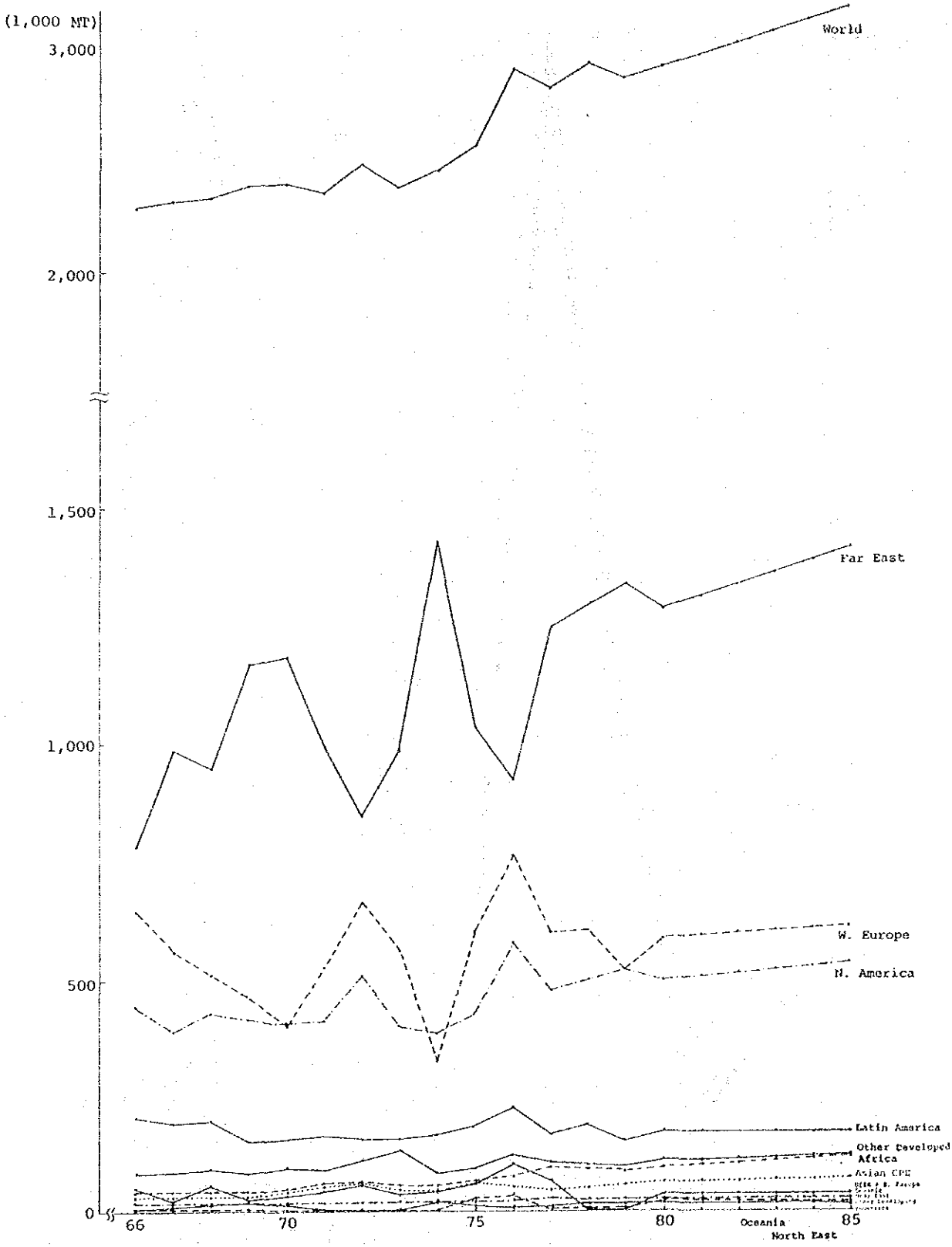
Source: Oil World

Appendix Fig. 15 World Prices of Copra, Palm Kernel, and Related Oils



Source: Oil World

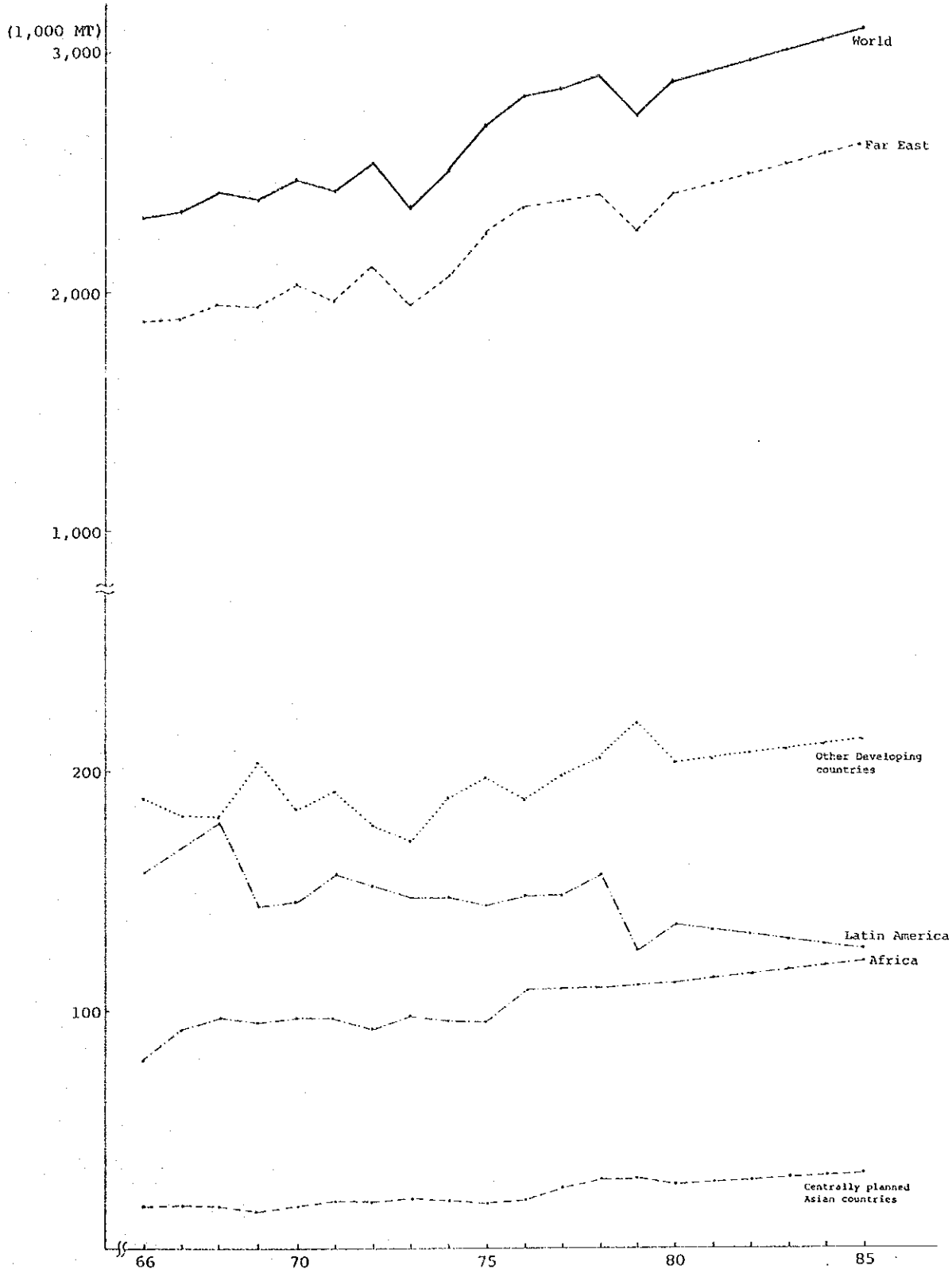
Appendix Fig. 16 Coconut Oil Consumption



Note : 1966-1979 - Actual
1980-1985 - Projected

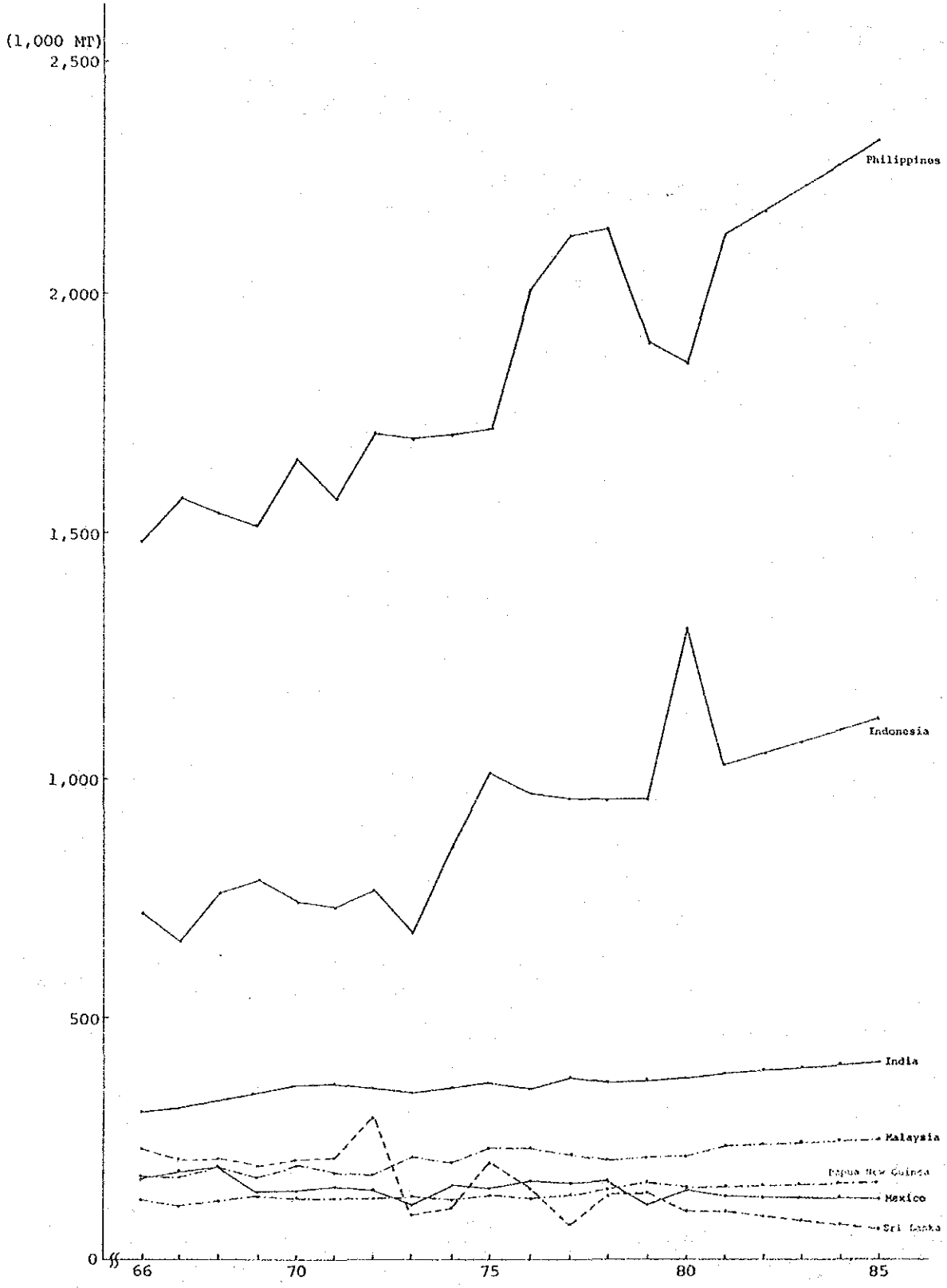
Source: FAO, Production Yearbook and Trade Yearbook, 1966-1979

Appendix Fig. 17 Copra Production (Oil Equivalent)



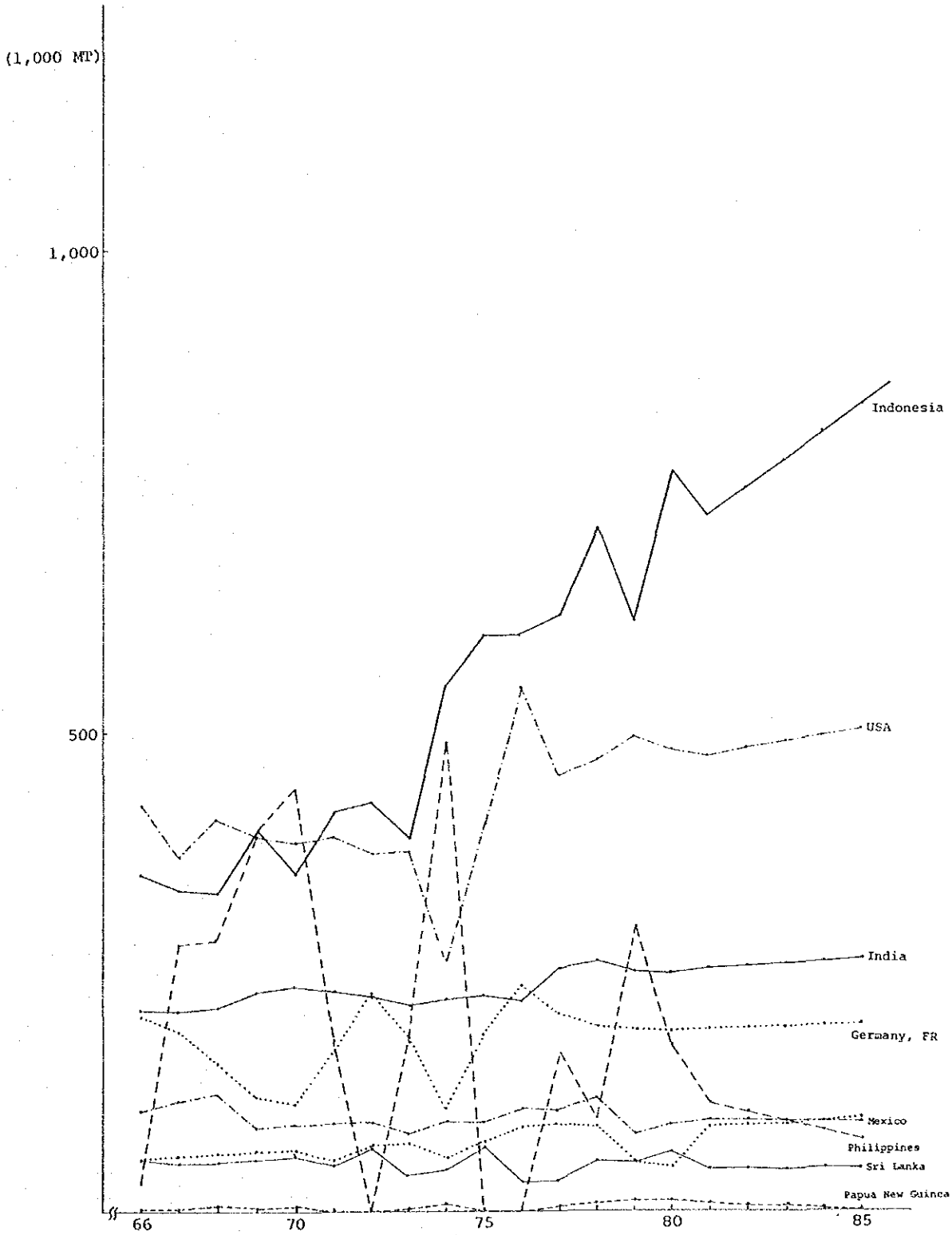
Note, Source: Same as Appendix Fig. 16

Appendix Fig. 18 Copra Production



Note, Source: Same as Appendix Fig. 16

Appendix Fig. 19 Coconut Oil (Projected Domestic Consumption)



Note, Source: Same as Appendix Fig. 16

Appendix Fig. 20 Palm Kernels Production (Oil Equivalent)

Note, Source: Same as Appendix Fig. 16

Appendix Fig. 21 Palm Kernel Oil Consumption

Note, Source: Same as Appendix Fig. 16

[1-2-3] SOYBEAN

A. SOYBEAN PRODUCTS

Soybean is an annual short-day crop widely cultivated in the temperate and tropical zones. The major producing countries are the United States, Brazil and China.

Soybean has many characteristics advantageous for cultivation, such as nitrogen fixation by root nodule bacteria, adaptability to various kinds of soils, and resistance against pests, harmful insects and cold. It is also a crop suitable for mechanized large-scale agriculture. It must be noted, however, that the crop is susceptible to insect damage in humid tropical areas and that the acid soil as exists in Carajas is unsuitable to soybean cultivation.

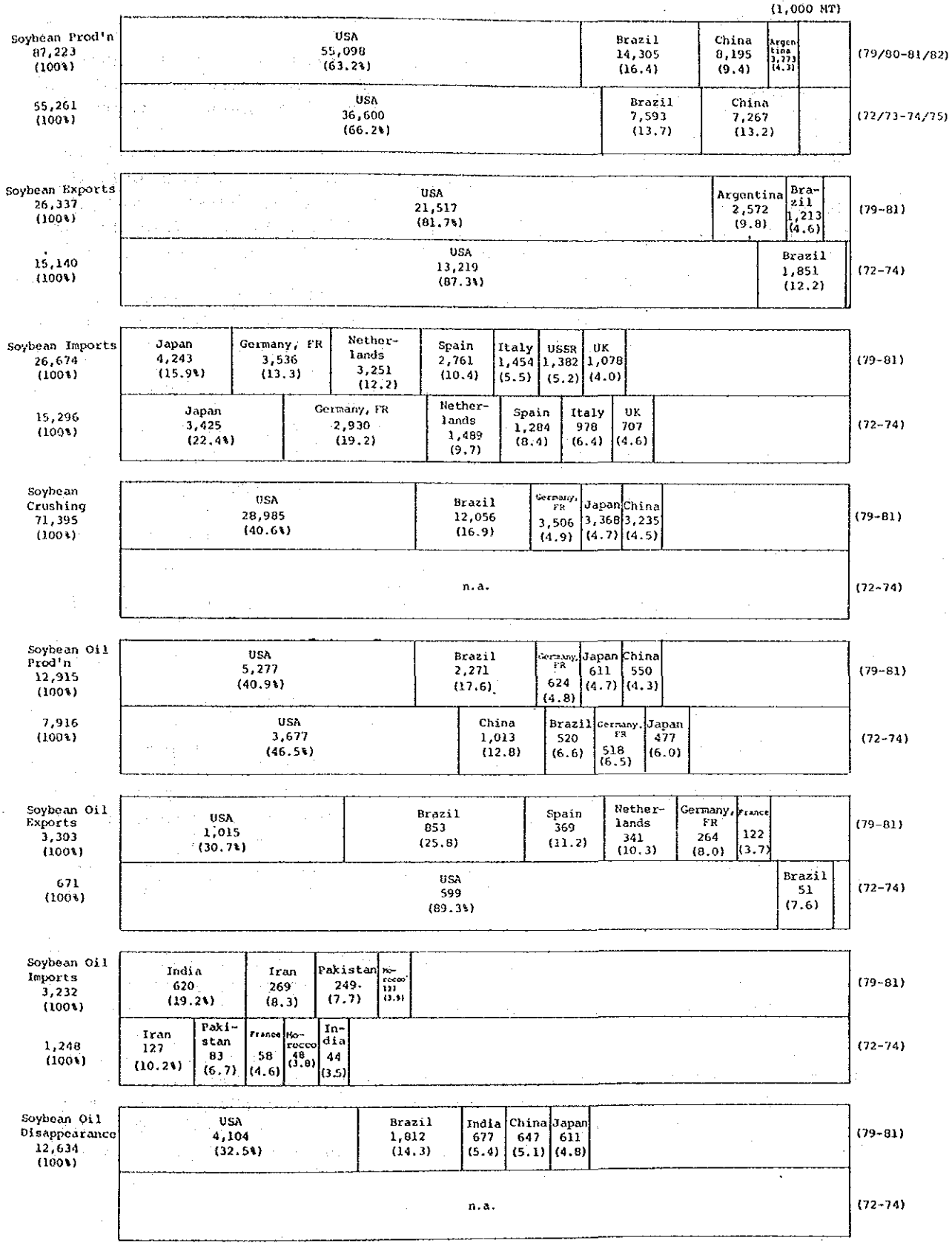
In terms of composition, soybean contains 16 to 22% oil and around 40% utilizable protein, and has a wide diversity of applications. The main products are, however, soybean oil and meal, which at present comprise almost the entire demand for soybean. An outline of these two products is given below.

I. Soybean Oil

Soybean seed contains 16 to 22% oil. Soybean oil, a liquid, semi-drying oil extracted from soybeans, is a major oil, accounting for about 30% of the world supply of edible vegetable oil. Recently, the soybeans are peeled before extraction in some cases, not only for improving the quality of oil and meal, but for providing high proteinic meal suitable for food as well as feed. Lecithin can be obtained as a by-product of the refining (degumming). The paste-like crude lecithin obtained by degumming has a wide range of uses, such as additive for food, and is used for medicine.

Chemical characteristics of soybean oil are as follows; iodine value is 123-152, saponification value is 188-195 and nonsaponifying matter is under 1.0%. Fatty acid composition is; palmitic acid

Fig. A-1 Flow of Soybean and Its Products
Yearly Average for 1979-81 and 1972-74
(79/80-81/82) (72/73-74/75)



(5-12%), stearic acid (2-7%), oleic acid (20-35%), linoleic acid (50-57%) and linolenic acid (3-8%).

Linoleic acid, which is one of the essential fatty acids, must be taken from food, because it cannot be bio-symthesized in the body. Soybean oil's nutritional value is its richness in essential fatty acids like linoleic acid.

It is used directly for food, such as cooking oil and salad oil, and some is hardened to be used in making margarine and shortening. For industrial purposes, paints, varnishes, linoleum and printing ink are made from soybean oil, and epoxidized oil is used in making plasticizer and alkyd resin.

Table A-1 Composition of Soybean by Parts

(%)

	Moisture	Protein	Carbohydrate	Fat	Ash
Cotyledon	10.6	41.3	14.6	20.7	4.4
Embryo	12.0	36.9	17.3	15.5	4.1
Seed coat	12.5	7.0	21.0	0.6	3.8

Source: Markley, K.S., Soybean and Soybean Products, 1950

II. Soybean Meal

Soybean meal is left after oil is extracted from soybeans. It generally contains 10 to 12% moisture, 46 to 48% crude protein, 0.3 to 1.2% crude fat, 5% crude fiber, 6% crude ash and small amounts of organic acid and phytin. The amount of oil remaining in soybean meal depends on the extraction method, and is less than 1% by the extraction method using chemical solvent.

After any of the remaining solvent (hexane) used in extraction is retrieved, masses of meal are pulverized and heat-treated (to denature protein with heat) according to use.

The meal is primarily used for feed, but recently more and more has come to be used as material for processed food. Heat treatment for feed meal is done at high temperature to make the taste suitable for livestock and to make digestion and absorption easy, but for food, the meal is treated at low temperatures to reduce protein denaturing.

B. PRODUCTION

I. Trend of World Production

According to data from FAO, soybean production in the world was 87.941 million tons in 1981. It is less than that of such major grains as wheat (458.195 million tons) and rice (413.785 million tons), but it is the largest of all oil seeds.

As for world production of oils and fats, in 1980/1981, soybean oil accounted for about 40% (12.223 million tons) of the total production of edible vegetable oils (30.351 million tons), excluding oils of palm origin such as palm oil, palm kernel oil, coconut oil and babassu oil. The share is still increasing. Total production of oils of palm origin in 1980/1981 was 9.067 million tons (Table B-1).

Soybean meal has found increased usefulness as an important protein in compound feed, and as an ingredient for protein foods in the diversifying human diet.

As for recent changes in soybean production, according to the FAO data, it increased 1.8-fold over the last 10 years, from 44.981 million tons in 1971 to 87.941 million tons in 1981, at an average rate of 6.9% a year (Table B-2). Growth rates of such grains as wheat and corn in the same period were 3.18% and 3.68%; of oil seeds such as rape seed and sunflower seed, 4.51% and 4.00%. The data shows that the growth of oil seeds production especially soybeans was greater than that of grain.

Several factors behind this marked growth were:

a. Consumption of oils and fats and meat increased with growth in personal incomes.

b. Because of Peru's poor catch of anchovies, soybean meal was required as a substitute for protein material for feed, raising the price of soybean and hence its profitability compared with other crops.

c. Soybean is relatively easy to grow in newly cleared land, and is suitable for crop rotation with corn.

d. In the United States, the world's largest producer, soybean as one of major cash crops, was not subject to production cuts forced by the set-aside policy (measures to restrict planting).

e. In South America, soybean can be harvested and sold between harvest seasons in the United States, a time when prices go up.

Table B-1 World Oil Production by Product

(1,000 MT)

	Product	1960	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976-77	1977-78	1978-79	1979-80	1980-81
Edible vegetable oils	Cottonseed	2,165	2,500	2,554	2,245	2,184	2,502	2,396	2,399	2,628	2,813	3,168	3,219	2,812	3,182	3,011	3,193	3,206
	Peanut	2,555	3,350	3,250	3,285	3,380	3,074	3,271	3,347	3,520	2,914	3,091	3,182	3,192	3,083	3,311	3,068	2,996
	Soybean	3,295	3,905	4,584	5,000	5,218	5,854	6,020	6,172	6,643	7,306	9,542	8,322	8,838	10,854	11,696	14,374	12,223
	Sunflower	1,665	3,130	2,978	3,498	3,719	3,705	3,799	3,608	3,631	3,557	4,542	3,988	3,737	4,719	4,705	5,581	4,781
	Rapeseed	1,105	1,450	1,420	1,690	1,830	1,480	1,880	2,475	2,556	2,390	2,475	2,704	2,485	2,683	3,657	3,421	3,841
	Sesame	540	610	565	555	605	565	590	720	655	615	635	603	598	610	655	618	602
	Safflower	110	185	200	255	265	185	210	225	300	240	210	217	217	275	326	342	257
	Olive	1,180	1,005	1,230	1,200	1,335	1,385	1,245	1,452	1,555	1,445	1,522	1,421	1,334	1,591	1,574	1,420	1,927
	Corn	175	245	255	260	250	270	275	280	280	300	311	297	410	460	466	512	518
	Subtotal	12,790	16,380	17,036	17,988	18,786	19,020	19,686	20,678	21,768	21,580	25,475	23,953	23,623	27,457	29,401	32,017	30,351
Palm oils	Coconut	1,925	2,130	2,232	2,085	2,171	2,050	2,134	2,428	2,779	2,325	2,237	2,922	3,118	3,304	2,937	3,014	3,261
	Palm kernel	440	435	425	375	375	400	440	462	454	431	488	507	546	560	605	661	586
	Palm	1,250	1,280	1,321	1,204	1,396	1,547	1,715	1,914	2,106	2,223	2,610	2,921	3,371	3,713	4,182	4,706	4,990
	Babassu	58	54	66	52	65	101	85	72	107	105	105	105	132	143	145	128	130
	Subtotal	3,673	3,899	4,044	3,716	4,007	4,098	4,374	4,876	5,446	5,084	5,440	6,455	7,167	7,720	7,869	8,509	9,067
Industrial oils	Linseed	960	1,080	1,080	950	785	920	1,145	1,265	889	750	755	745	684	907	744	806	679
	Castor	270	335	325	390	380	375	373	348	322	413	493	339	287	327	392	377	367
	Oiticica	20	12	18	2	29	2	18	20	14	1	11	11	14	14	14	14	14
	Tung	121	149	126	150	123	120	130	140	140	96	96	108	100	95	101	100	90
	Olive (Rev.)	106	98	117	134	146	148	117	131	132	139	145	132	153	172	146	134	179
	Subtotal	1,477	1,674	1,666	1,626	1,463	1,565	1,783	1,904	1,497	1,399	1,500	1,335	1,238	1,515	1,398	1,431	1,329
Animal fats	Butter	3,855	4,300	3,900	4,000	4,050	4,000	3,850	3,900	4,100	4,150	4,502	4,572	4,944	4,981	4,987	4,989	4,927
	Lard	3,730	3,911	3,934	4,013	4,017	3,904	4,044	4,262	4,331	4,202	4,379	4,330	3,571	3,871	3,941	3,962	3,827
	Tallow/Grease	3,050	3,790	3,900	4,180	4,251	4,252	4,422	4,595	4,589	4,413	5,121	4,723	5,815	5,527	5,814	6,063	6,047
	Subtotal	10,635	12,001	11,734	12,223	12,318	12,156	12,316	12,757	13,020	12,765	14,002	13,625	14,330	14,379	14,742	15,014	14,801
Marine oils	Whale	380	198	115	103	92	75	70	70	65	55	40	45	15	8	10	10	10
	Sperm whale	111	154	146	150	121	132	140	135	125	125	120	119	64	58	58	58	58
	Fish (inc. liver)	462	784	889	1,104	1,100	970	1,029	1,141	921	795	1,001	1,003	1,004	1,165	1,181	1,249	1,184
	Subtotal	953	1,136	1,150	1,357	1,313	1,177	1,239	1,346	1,111	975	1,161	1,167	1,083	1,231	1,249	1,317	1,252
	World total	29,528	35,090	35,630	36,910	37,887	38,016	39,398	41,561	42,842	41,803	47,578	46,535	47,441	52,302	54,659	58,801	56,771

Note: Oil seeds are calculated in terms of oil

Source: USDA, Foreign Agriculture Circular

Table B-2 Production of Soybean by Major Producing Countries by FAO Data: 1966-1981

(1,000 MT)

	USA	Brazil	China	Argentina	Indonesia	Canada	Paraguay	USSR	India	Romania	World Total
1966	25,270	595	7,563	18	417	245	20	586		20	35,615
1967	26,575	716	7,875	21	416	220	18	543		41	37,441
1968	30,127	654	7,073	22	420	246	14	528		47	40,330
1969	30,838	1,057	7,567	32	389	209	22	434		51	40,335
1970	30,675	1,509	8,765	27	498	283	40	595	1	91	43,656
1971	32,008	2,077	8,061	59	516	280	74	535	5	165	44,981
1972	34,581	3,228	7,060	78	518	375	97	258	8	186	47,764
1973	42,118	5,012	7,361	272	541	397	122	424	18	244	58,163
1974	33,102	7,877	7,467	496	586	280	181	360	70	298	52,571
1975	42,114	9,893	7,462	485	590	367	220	780	120	213	64,357
1976	35,043	11,227	6,703	695	522	250	284	480	120	213	57,311
1977	47,949	12,513	7,302	1,400	523	527	377	540	130	191	73,510
1978	50,899	9,535	7,591	2,500	616	516	333	634	200	230	75,282
1979	61,715	9,959	7,482	3,700	575	672	549	600	300	376	88,637
1980	48,772	15,153	7,906	3,500	642	713	575	525	450	448	80,870
1981	55,260	14,978	8,016	3,770	653	631	600	500	500	268	87,941

Source: FAO, Production Yearbook

Table B-3 Cultivated Area of Soybean in Major Producing Countries by FAO Data: 1966-1981

(1,000 ha)

	USA	Brazil	China	Argentina	Indonesia	Canada	Paraguay	USSR	India	Romania	World Total
1966	14,789	491	8,551	16	605	113	14	855		18	26,548
1967	16,108	612	8,052	17	589	117	13	850		49	27,584
1968	16,750	724	8,049	20	677	119	8	854		49	28,463
1969	16,728	906	8,043	28	553	130	12	850		54	28,539
1970	17,097	1,319	8,032	26	695	136	28	861	2	79	29,486
1971	17,282	1,716	7,540	36	680	149	40	868	9	147	29,677
1972	18,487	2,191	7,436	68	698	164	76	905	14	109	31,484
1973	22,527	3,615	7,036	157	744	190	81	838	32	183	36,926
1974	20,777	5,143	7,044	334	753	168	127	830	100	239	37,107
1975	21,682	5,824	6,741	356	752	158	150	811	160	121	38,448
1976	19,974	6,416	6,727	433	646	153	173	762	160	155	37,112
1977	23,314	7,070	6,880	660	646	202	229	786	170	171	41,869
1978	25,634	7,778	7,168	1,150	733	285	272	815	230	203	46,089
1979	28,542	7,321	7,266	1,600	710	283	360	838	330	270	49,573
1980	27,461	9,766	7,515	2,030	726	283	475	854	560	363	51,816
1981	26,988	8,485	7,613	1,880	732	287	403	864	600	309	50,219

Source: FAO, Production Yearbook

f. High-yielding varieties were developed in the United States. Associating with the HYVs, yield per hectare increased by about 16% in the period 1971-1981, while harvested areas increased by about 69% in the same period. As a result, production almost doubled.

As for movements in each country, the growth rate of world soybean production during this time was about the same as that in the United States, which produced 63% of the world total in 1981. It can be seen that production growth in the United States led world production in the 1970s. However, the U.S. percentage declined from 66% of world production in 1971 to 63% in 1981, and this indicates that countries other than the United States increased production: 7.2-fold in Brazil, 63.9-fold in Argentina and more than doubled in Mexico and Canada. On the other hand, increases in soybean production by Asian countries, including China (third in the world), were not so large. This may be because, except for north-eastern China, production of soybean in Asia is basically for direct eating, and is different from commercial production in the United States and South America, where growers use large farming machinery and plant new seed each year to raise productivity. China's soybean production accounted for more than half of the world total before World War II, but currently it is estimated at about 8 million tons, less than in the pre-war era.

Some countries in Oceania and Africa show high growth rates, but production quantities remain small. In Australia, rainfall is often not sufficient for soybean cultivation and production is riskier than wheat and barley, so a big increase is not likely in the future. Due to the production increases in East European nations such as Romania, Bulgaria and Yugoslavia, total European production grew substantially. Production in the USSR has reached a plateau. Thus, many producing countries other than the United States have increasing production, and the absolute superiority of the United States is declining.

II. Supplies of Soybean and Its Products by Producing Countries

Only a few countries are self-sufficient in soybean and its products. Eighteen countries produced more than 100,000 tons each of soybean in 1979, but as shown in Table B-4, only four are completely self-sufficient: The United States, Brazil, Argentina and Paraguay.

Other producing countries depend on imports of soybean and its products to fill shortages, which domestically-produced soybeans cannot fill. Among them, China and Canada, although they produce relatively large quantities, import soybean and export soybean for food.

As described above, in surveying the situations of soybean output in producing countries and the trade in soybean and its products,

Table B-4 Classification of World Soybean Producing Countries by Production and Trade

(1,000 tons)

	Domestic production	Imports			Exports		
		Soybean	Meal	Soybean-oil	Soybean	Meal	Soybean-oil
Producer & importer							
Japan	192	4,132	283	0.0	0.0	1	3
Korea, Rep. of	257	428	152	0.0	0.0	5	0.0
Korea, Dem. Rep.	330	13	-	24	-	-	-
Indonesia	680	177	28	0.0	0.0	-	-
Thailand	167	0.0	59	3	10	0.0	-
India	350	-	-	556	-	27	-
Egypt	106	53	8	9	-	-	-
Bulgaria	157	0.0	136	-	30	-	0.0
Romania	383	329	320	-	-	-	-
USSR	467	1,765	52	20	-	-	-
Mexico	719	578	90	0.0	-	-	-
Colombia	146	7	-	76	-	-	-
Producer, importer & exporter							
China	7,482	1,664	0.0	116	288	12	4
Canada	671	351	465	22	47	23	10
Producer & exporter							
USA	61,722	0.0	-	0.0	20,905	6,087	1,100
Brazil	10,240	213	-	77	638	5,177	533
Argentina	3,700	4	-	-	2,834	347	81
Paraguay	549	-	-	-	334	34	0.0

Notes : 1) Eighteen countries which produced over 100,000 tons of soybeans in 1979.
2) Figures of domestic production, imports and exports are of 1979.
3) Imports and exports under 500 tons are listed as 0.0 (zero).

Sources: FAO, Production Yearbook, 1981
FAO, Trade Yearbook, 1980

producing countries can be classified into three groups: a. producer and importer; b. producer and importer-exporter; c. producer and exporter. In this subsection, countries producing over 100,000 tons are divided into these groups and characteristics of each are described.

Countries in Group A produce less than 700,000 tons, producing

less and importing more than those in Group B or Group C. Of these countries, Japan, the Repubic of Korea, Indonesia, Thailand, Egypt, Bulgaria, Romania, the USSR and Mexico import soybean and meal in larger quantities than other soybean products, while the Democratic Republic of Korea, India and Colombia import a large proportion of soybean oil.

Two countries in Group B, China and Canada, are basically importing countries, but they produce the protein-rich variety of soybean called "white navel" for food uses. East Asian countries like Japan, where this kind of soybean is used in making traditional soybean foods (beancurd, bean-paste, tempeh and soybean milk).

China, whose domestic transportation system is not fully organized, rather than transferring surpluses in its north-eastern districts to the south where soybean is scarce, exports to Japan where a certain amount of food soybean is needed, at a price slighly higher than the international price. For the southern districts, which are short of soybean, the country imports United States soybean, which is cheaper than food soybean at the international price (China's export price of soybean has been lower relative to the international price since late 1982, because of its bumper crop of oilseeds). As for characteristics of the imports of this group, China imports mainly soybean, and Canada imports both soybean and soybean meal.

The four countries in Group C (the United States, Brazil, Argentina and Paraguay) are the most important producing and exporting countries; they produced 84.8% (or 74.608 million tons) of world soybean production (87.941 million tons) in 1981 and accounted for as much as 97.8% (26.279 million tons) of world soybean exports in that year. These countries are, at the same time, big exporters of soybean oil and soybean meal, having shares of 60.9% and 77.3% respectively in world exports in 1980 (FAO data).

In Brazil, owing to the protection given to the domestic extraction industry, the country rapidly expanded its extraction capacity, reaching a level of about 22 million tons in 1981, which substantially exceeded the country's soybean production (14.978 million tons) in the same year. Therefore, in an attempt to enhance operations in extracting mills and improve the country's balance of payments, the Government instituted a draw-back system, providing low interest loans to aid extractors to import soybean. As a result, Brazil imported 933,000 tons of soybean (Oil World data) from the United States and Paraguay in 1981. In the same year, the amount of exports was 1.450 million tons of soybean, 1.281 million tons of soybean oil and 8.904 million tons of soybean meal (Oil World data).

Exports of Paraguay and Argentina are mainly bean, with each country exporting about 50% and a little less than 80% of their domestic production, but Argentina is rapidly expanding the share of

soybean products in its exports, and is expected to become a Brazilian type exporter of soybean and its products in the near future. The United States is the world's biggest producing and exporting country of soybean, influencing international prices of soybeans, and being able to export both soybean and its products at will, according to demand in the export market.

An overview of production movements in the above countries is as below:

First, of the 12 countries in Group A, seven are Asian, two are in East Europe, and two are in Central and South America. Through the 1960s and 1970s in six of the Asian countries (Japan excluded), production had been continuously on the rise. Japan's soybean production decreased until the early 1970s, but began to increase in the late 1970s. However, the production was only 212,000 tons which is mostly used for food uses. The domestic production supplies 27% of domestic needs (785,000 tons) for food soybeans. The share of domestic production in the total requirement including for oil extraction is only 4.6%.

Thailand's production quintupled in the last 20 years, the Republic of Korea increased by about 70%, the Democratic Republic of Korea by 60%, and Indonesia 50%. Among them, the Republic of Korea's and the Democratic Republic of Korea's increases were due to increased yield, and Indonesia's and Thailand's growth resulted from increased hectarage under cultivation.

Of the two countries in the East European bloc, Romania raised both hectarage and yield, but its yield varies widely from year to year. USSR's production level is about 500,000 tons and both its hectarage and yield per hectare have been sluggish.

As for the two countries in Central and South America, mainly as a result of a marked increase in hectarage, production grew by a factor of ten in Mexico, and by a factor of four in Colombia.

Of the two countries in Group B, China expanded hectarage under cultivation chiefly in the north-eastern districts from the 1960s to the early 1970s, but in the late 1970s, expansion of planted hectarage was sluggish because of the political disturbances in the country and because drought and flood decreased the area under cultivation and yield per hectare, causing a decline in soybean production. Meanwhile Canada has been maintaining increases in both hectarage and yield per hectare for the last 20 years.

As for Group C, all four countries have shown tremendous growth in the past 20 years: production in the United States increased by a factor of 2.5, by 33 in Brazil, by 197 in Argentina, and by 57 in Paraguay. Of these, the United States and Argentina increased both hectarage and yield per hectare, but in Brazil and Paraguay, growth was brought about by hectarage expansion.

Yield per hectare in these countries is shown in Table B-5. In five of the countries, averages for 1979/81 exceeded 2 tons/ha: Egypt, Canada, the United States, Argentina and Colombia. When compared with the averages for 1969/71, increases in Canada and Argentina were large, but both showed wide fluctuations each year. Fluctuation in the United States and Colombia were small, demonstrating a stable level of yield.

Countries which yielded around 1.5 tons/ha are Mexico, Brazil and Paraguay, and compared with the 1969/71 3 year average, growth in Brazil was noticeable. Yield per hectare in Brazil and Paraguay varies widely each year.

Other countries have yields of less than 1.4 tons/ha. China, traditionally a big producing country, has shifted to a level of 1.05 tons/ha of yield for these three years, staying on a plateau since the 1.03 tons/ha of 1969/71 (3 year average). The USSR has the lowest yield of the eighteen producing countries, with an yield of 0.6 tons/ha, not so different from the 0.61 tons/ha of 1969/71 (3 year average).

Table B-5 Yields per Hectare of the World Soybean Producing Countries

(ton/ha)

	1961-71	1979	1980	1981	3-year average of 1979-81
World	1.487	1.752	1.561	1.751	1.688
Egypt		2.514	2.657	2.524	2.565
Canada	1.860	2.368	2.517	2.199	2.361
Mexico	1.878	1.682	2.014	1.884	1.860
USA	1.830	2.161	1.776	2.048	1.995
Argentina	1.299	2.313	1.724	2.005	2.014
Brazil	1.178	1.240	1.551	1.765	1.519
Colombia	1.954	2.042	1.978	2.027	2.016
Paraguay	1.443	1.524	1.210	1.489	1.408
China	1.033	1.030	1.052	1.053	1.045
India	0.545	0.713	0.804	0.833	0.783
Indonesia	0.728	0.867	0.885	0.891	0.881
Japan	1.286	1.471	1.223	1.458	1.384
Thailand	0.965	1.285	0.778	0.842	0.968
Bulgaria	0.876	1.631	1.141	1.207	1.326
Romania	1.095	1.267	1.232	0.866	1.122
USSR	0.606	0.557	0.615	0.579	0.584

Source: FAO, Production Yearbook, 1981