

# INDONESIAN AGRICULTURE AND GATT

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*GATT Research Paper 94-GATT 9*  
*March 1994*

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This material is based upon work supported by the Cooperative State Research Service, U.S. Department of Agriculture, under Agreement No. 89-38812-4480. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

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### **ABSTRACT**

This paper attempts to determine the possible impacts of a General Agreement on Tariffs and Trade (GATT) agreement on the Indonesian agricultural sector. The emphasis of the study is analytical. In particular, the study focuses on how eliminating internal price support policies and trade barriers will affect agricultural production, food security, the Indonesian trade position in world agricultural markets, and income distribution among the urban and rural sectors and low- and high-income farmers over the short and long terms. A liberalized trading system is expected to contribute to a stable Indonesian food supply.

## **INDONESIAN AGRICULTURE AND GATT**

Indonesia consists of more than 13,600 tropical islands. It includes five of the world's largest islands: Kalimantan (the Indonesian part of Borneo), Sumatra, Irian Java (Western New Guinea), Sulawesi, and Java. Java has the most fertile soils and accounts for most of the country's agricultural and industrial output.

Indonesia had approximately 175 million people in 1988, making it the fifth most populous country in the world. The average household size is 4.8 people and the population is growing at a rate of about 2.1 percent per year. The island of Java, which covers only 7 percent of Indonesia's total area, supports approximately 61 percent of the population.

Approximately 90 percent of the population is Muslim, and the rest is Christian (4 percent), Hindu, and Buddhist. The national language is Indonesian, but approximately 250 other local languages and dialects are spoken. The currency is the rupiah.

Indonesia has many natural resources: it is among the world's leading producers of petroleum, natural gas, tin, natural rubber, palm oil, coconuts, coffee, tea, spices, and rice. Its major exports are petroleum and natural gas, rubber, timber and wood products, tin, coffee, and shrimp (Figure 1).

Of Indonesia's total land area of 192 million hectares, forests occupy 113 million hectares. Cropland covers 22 million hectares, of which 6 million hectares are planted to perennial crops, 9 million hectares are dry land, and 7 million hectares are wetland suitable for rice cultivation.

### **Characteristics of the Agricultural Sector**

As a consequence of the capital-intensive industrial urban development strategy adopted by the Indonesian government in recent decades, agriculture has been steadily losing its importance in the Indonesian economy. Nevertheless, it is still the major source of employment for Indonesians and home for a large part of the population. In 1988, the agricultural population was about 80 million

## INDONESIA'S NON-OIL EXPORTS

January-June 1985

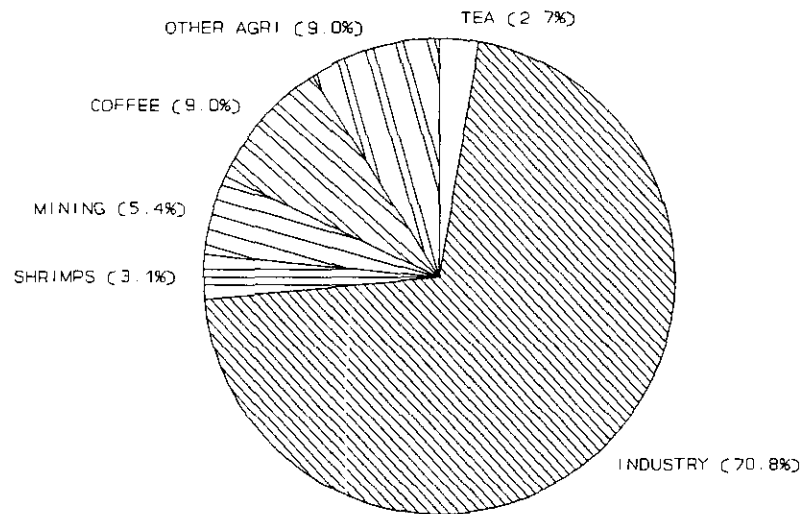


Figure 1. Indonesia's non-oil exports.



people. There were 34 million economically active people in agriculture, representing 50 percent of the total (Table 1).

This declining importance of agriculture is also reflected in the slower growth rate of agricultural output compared with industry and manufacturing and its lower distribution share of the Gross Domestic Product (GDP). Since 1965, the agricultural output growth rate has been below the national average and well below the rates for industry and manufacturing (Table 2). In 1989, agriculture accounted for 23 percent of the GDP (Table 3).

### The Structure of Agriculture

Most land holdings in Indonesia are very small: in 1980, 34 percent of all farm households owned or worked less than 0.25 hectares and another 29 percent worked less than 0.5 hectares (Table 1). The high population pressure in Java means that farms are even smaller: 43 percent of all farm

Table 1. Total agricultural and economically active population

|      | <u>Population</u> |        | <u>Economically Active in Agr.</u> |        |                        |
|------|-------------------|--------|------------------------------------|--------|------------------------|
|      | Total             | Agr.   | Total                              | Agr.   | Percent in Agriculture |
| 1980 | 150,958           | 80,293 | 56,253                             | 32,180 | 57.2                   |
| 1983 | 159,434           | 90,070 | 54,281                             | 30,665 | 56.5                   |
| 1984 | 162,167           | 90,371 | 55,150                             | 30,733 | 55.7                   |
| 1985 | 166,464           | 81,217 | 63,549                             | 33,586 | 52.8                   |
| 1986 | 169,426           | 81,179 | 65,146                             | 33,860 | 52.0                   |
| 1987 | 172,308           | 81,048 | 66,771                             | 34,117 | 51.1                   |
| 1988 | 175,109           | 80,829 | 68,409                             | 34,351 | 50.2                   |

SOURCE: FAO 1984-88.

Table 2. Indonesian production growth rate

| Sector                 | 1965-80 | 1980-89   |
|------------------------|---------|-----------|
|                        |         | (percent) |
| Gross Domestic Product | 7.0     | 5.3       |
| Agriculture            | 4.3     | 3.2       |
| Industry               | 11.9    | 5.3       |
| Manufacturing          | 12.0    | 12.7      |
| Services               | 7.3     | 6.6       |

SOURCE: World Development Report 1990.

Table 3. Indonesian production structure

|  | 1965  | 1989      |
|--|-------|-----------|
| Gross Domestic Product (Million dollars) | 3,840 | 93,970    |
|  |       | (percent) |
| Agriculture                              | 56    | 23        |
| Industry                                 | 13    | 37        |
| Manufacturing                            | 8     | 17        |
| Services                                 | 31    | 39        |

SOURCE: World Development Report 1990.

households in Java own or work less than 0.25 hectares. In contrast, 51 percent of households outside Java work more than 0.5 hectares (Table 4).

There is an important technological and regional dualism in the Indonesian agricultural sector. One sector is technologically advanced and the other is technologically outdated. For instance, in the commercial agricultural sector, which is foreign-market oriented, large, capital-intensive modern farms coexist with small labor-intensive farms. And from a regional perspective, there are large productivity and income gaps.

Agriculture supports the urban-industrial sector. Basically, it has to find a way to use economic surplus to promote growth in the urban private and public sectors by providing a continuous supply of cheap food. Urban wages can be kept low, the labor force can be maintained, and markets for industrial goods can be created. Based on this role, the fundamental objectives of the Indonesian government agricultural policy are food security with price stability, rapid income growth, and desirable income distribution. Among these objectives, food security with price stability is the central objective of the government's agricultural policy. Once this basic objective is achieved, the other two objectives will follow.

Table 4. Percentage distribution of Indonesian land holdings, 1980

|              | Less than<br>0.25 hectare       | 0.25 to<br>0.5 hectare | More than<br>0.5 hectare |
|--------------|---------------------------------|------------------------|--------------------------|
|              | (Percentage of farm households) |                        |                          |
| Java         | 43                              | 30                     | 27                       |
| Outside Java | 21                              | 28                     | 51                       |
| Indonesia    | 34                              | 29                     | 37                       |

SOURCE: Central Bureau of Statistics 1980.

The importance of achieving food security with price stability is reflected in a relatively high (but decreasing) share of agriculture in total development expenditures (Table 5). It is important to note that this decline was partially attributable to decreased oil revenues.

Table 5. Agriculture's share of development expenditures

|         | Total Development Expenditures               | Share of Agriculture in Total |
|---------|--|-------------------------------|
|         | (billion rupiahs in constant 1977-78 prices) | (percent)                     |
| 1974-75 | 1,558.7                                      | 35.5                          |
| 1975-76 | 1,952.3                                      | 23.8                          |
| 1976-77 | 2,322.2                                      | 19.5                          |
| 1977-78 | 2,157.6                                      | 16.5                          |
| 1978-79 | 2,411.9                                      | 20.1                          |
| 1979-80 | 2,867.3                                      | 13.1                          |
| 1980-81 | 3,792.4                                      | 15.7                          |
| 1981-82 | 4,180.7                                      | 15.5                          |
| 1982-83 | 4,066.1                                      | 15.3                          |
| 1983-84 | 5,050.6                                      | 12.6                          |
| 1984-85 | 4,544.2                                      | 18.8                          |
| 1985-86 | 4,727.4                                      | 13.0                          |
| 1986-87 | 3,443.0                                      | 14.4                          |

SOURCE: Pearson et al. 1991.

To ensure the achievement of these objectives, the government has enacted price stabilization policies, incentive price policies to increase production (price floors and fertilizer subsidies), intervention in the commercialization of some basic foodstuffs (public storage, distribution, imports), and public investment policies (irrigation infrastructure and maintenance, transportation facilities, and research, development and dissemination of new technologies).

### **Major Commodities**

The major Indonesian food crop is rice. Corn, cassava, soybeans, peanuts, mungbeans, and sweet potatoes are the other main food crops. The major industrial crops are rubber, palm oil, palm kernels, coffee, tea, sugar cane, pepper, coconut, sago, cloves, and cacao. The main commercial vegetables are chili peppers, shallot, cabbage, and potatoes. The main fruits are: banana, mango, citrus, papaya, and pineapple. The production of the main crops in Indonesia is presented in Table 6.

Rice accounts for more than one-half of the area harvested to food crops each year. In 1990, the rice area harvested was 10.531 million hectares (Table 7). In 1987, rice production accounted for 52.5 percent of total food-crop production, 31.7 percent of total agricultural production, and 8.1 percent of the GDP (Table 8). The rice area is concentrated in Java, which accounted for 52 percent of the rice area harvested and 61 percent of the output in 1983. Approximately 72 percent of the wet rice land in Java is irrigated, compared with 42 percent outside Java. There is still potential to expand the country's rice land and to increase the number of crops grown each year by extending and improving irrigation systems.

Corn is the second most important food crop and is widely planted in the drier part of the country: east and central Java, Sulawesi, and Nusa Tenggara. Nevertheless, the corn area harvested in 1990 was approximately one-third the rice area.

Table 6. Indonesian production, by crop

|              | 1985                | 1986   | 1987   | 1988   | 1989   | 1990   |
|--------------|---------------------|--------|--------|--------|--------|--------|
|              | (1,000 metric tons) |        |        |        |        |        |
| Rice         | 39,033              | 39,727 | 40,078 | 41,676 | 44,726 | 44,490 |
| Corn         | 4,330               | 5,920  | 5,156  | 6,652  | 6,193  | 6,741  |
| Soybeans     | 870                 | 1,227  | 1,177  | 1,270  | 1,301  | 1,402  |
| Groundnuts   | 754                 | 780    | 762    | 842    | 879    | 919    |
| Sugar        | 22,621              | 26,208 | 26,135 | 24,825 | 24,416 | 25,503 |
| Copra        | 1,260               | 1,150  | 1,250  | 1,195  | 1,027  | 1,250  |
| Palm Kernels | 240                 | 284    | 297    | 356    | 414    | 470    |
| Rubber       | 1,096               | 1,113  | 1,132  | 1,235  | 1,260  | 1,300  |
| Tea          | 111                 | 129    | 56     | 137    | 156    | 165    |

SOURCE: FAO 1984-90.

Table 7. Area harvested, by crop

|            | 1985             | 1986  | 1987  | 1988   | 1989   | 1990   |
|------------|------------------|-------|-------|--------|--------|--------|
|            | (1,000 hectares) |       |       |        |        |        |
| Rice       | 9,988            | 9,988 | 9,923 | 10,138 | 10,531 | 10,301 |
| Corn       | 2,440            | 3,143 | 2,026 | 3,406  | 2,944  | 3,169  |
| Soybeans   | 896              | 1,254 | 1,101 | 1,177  | 1,187  | 1,268  |
| Groundnuts | 510              | 601   | 551   | 608    | 612    | 628    |

SOURCE: FAO 1984-90.

Table 8. Percentage of rice in Indonesian agriculture

|                        | 1968            | 1975 | 1980 | 1983 | 1985 | 1987 |
|------------------------|-----------------|------|------|------|------|------|
|                        | (percent share) |      |      |      |      |      |
| Food Crops             | 54.4            | 51.2 | 49.0 | 46.3 | 48.3 | 52.5 |
| Agriculture            | 37.0            | 32.7 | 27.6 | 28.9 | 30.1 | 31.7 |
| Gross Domestic Product | 18.8            | 10.3 | 6.8  | 6.9  | 7.1  | 8.1  |

SOURCE: Pearson et al. 1991.

Indonesia is one of the world's most important producers of copra, natural rubber, tea, coffee, and palm kernels. Almost all of these crops are exported.

### Domestic Consumption

Rice is the most important staple in the Indonesian diet. The average food expenditure share of rice for low-income people was 37 percent, whereas that for the high-income group was 20 percent (Manrique 1991). Vegetables are the second most important food group for all income classes, with a food expenditure share of 10 percent for the low-income group and 9.4 percent for the high-income group. Palawija crops (cassava, corn, nuts, and wheat) are the third most important food group; with a food expenditure share of 7.6 percent for the low-income group and 5.8 percent for the high-income group (Manrique 1991).

## **Trade**

Trade policy is an important component of Indonesian food and agricultural development policy. In this context, international trade has been used to dispose of excess supply or satisfy excess demand rather than as a catalyst for sectoral resource allocation.

In 1989, food imports were approximately 8 percent of total merchandise imports, whereas in 1965 they were 6 percent (Table 9). In 1989, exports of food and other primary commodities were 21 percent of total exports, whereas in 1965 they were 53 percent (Table 10). This change also reflects the switch to an industrial, capital-intensive development strategy.

Rice. Indonesia is one of the largest producers of rice in the world. In 1988, its share of total world production was 8.5 percent (Table 9, Figure 2). Other major producers were China, India, Bangladesh, and Thailand. Together, these five countries accounted for almost 75 percent of total world rice production (Figure 2). In 1988, Indonesia's share of total world exports was 0.2 percent. The major exporting countries were Thailand, the United States, Pakistan, and China, accounting for 84 percent of world rice exports (Figure 3).

No rice-importing country accounts for more than 10 percent of total world rice imports, so no individual country can affect world prices. In 1988, the major importers were India, Iraq, the USSR, and Hong Kong (Figure 4), but no dominant country was detected.

In the 1970s, the import share of total consumption averaged 15 percent. This tendency was reversed in 1980. Since then, the import share of total rice consumption has been steadily declining. This share averaged 3 percent between 1980 and 1984. Indonesia still imports processed rice products, including flakes, meal, flour, and glutinous rice. On average, 1985-86 rice exports represented 2 percent of total production.



Table 9. Indonesia's share of world production of agricultural commodities

| Commodity        | 1988 Share |
|------------------|------------|
|                  | (percent)  |
| Rice             | 8.5        |
| Cassava          | 11.1       |
| Corn             | 2.7        |
| Rubber           | 24.6       |
| Tea              | 5.8        |
| Palm Kernel Cake | 12.3       |
| Soybeans         | 2.2        |
| Groundnuts       | 2.9        |

SOURCE: FAO 1991.

Table 10. Indonesia's share of world agricultural commodity exports

| Commodity        | 1988 Share        |
|------------------|-------------------|
|                  | (percent)         |
| Rice             | 0.2               |
| Cassava          | 10.6              |
| Corn             | 0                 |
| Rubber           | 26.8              |
| Tea              | 8.8               |
| Palm Kernel Cake | 13.9 <sup>a</sup> |

SOURCE: FAO 1991.

<sup>a</sup>Percentage corresponds to 1986.

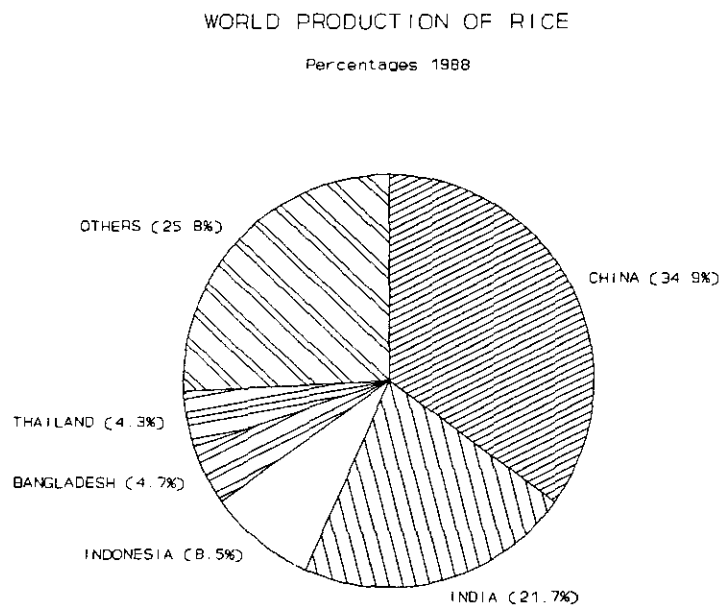


Figure 2. World production of rice.

## WORLD EXPORTS OF RICE

Percentages 1988

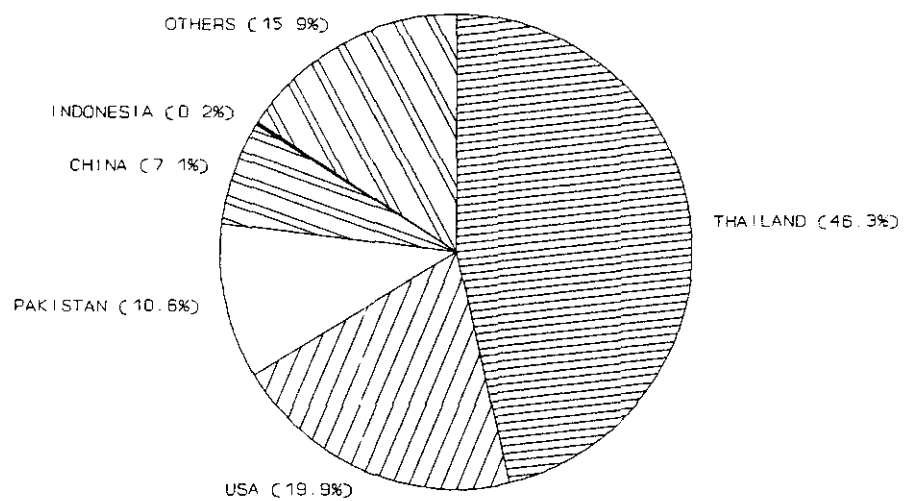


Figure 3. World exports of rice.

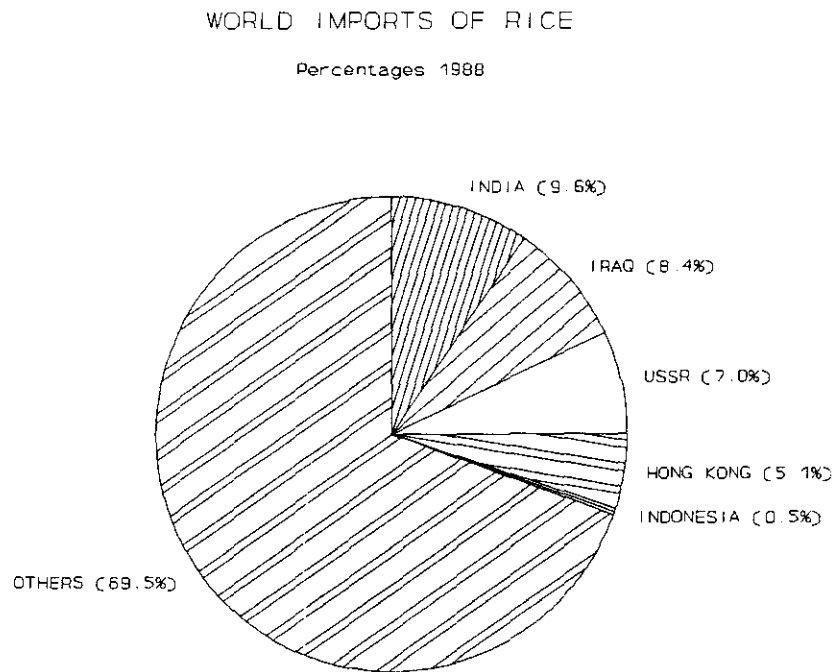


Figure 4. World imports of rice.

Until 1984, Indonesia was a net importer of rice. Production has been increasing steadily since 1970. Growth in rice production averaged 4.6 percent between 1970 and 1986, but was fastest between 1980 and 1985. This rapid production growth enabled Indonesia to substitute domestic production for imports of milled and rough rice in 1985 and 1986. Rice production grew because of modern production technology; production increases have been attributable mostly to increased yields and only partly to a larger area harvested. Output prices were set at levels that provided incentives to farmers to adopt and invest in the new technology. In addition, the adoption of this technology has been supported by improvements in the irrigation, transport, and marketing systems through government intensification programs and input pricing policies, and by more efficient deliveries of inputs and credit. Therefore, improved technology, better environment, and infrastructure—combined with successful implementation of input and output price policies—provided incentives to farmers. The availability of inputs and extension services led to food self-sufficiency and created surpluses for export.

Wheat. Wheat is not produced in Indonesia. All wheat is imported from the United States, Australia, and Canada. Indonesian wheat imports accounted for 1.6 percent of the world total imports (Table 11, Figure 5). The largest importers were the USSR, China, Egypt, and Japan, accounting for 48 percent of total wheat imports (Figure 5).

Indonesia has traditionally used wheat imports to finance domestic development activities (from concessionary trade assistance) and to offset unexpected shortfalls in domestic rice production. Recently, wheat imports increased because of income growth and urban population growth in the 1970s and 1980s.

Table 11. Indonesia's share of world agricultural commodity imports

| Commodity  | 1988 Share       |
|------------|------------------|
|            | (percent)        |
| Rice       | 0.5              |
| Corn       | 0.1              |
| Soybeans   | 1.3 <sup>a</sup> |
| Groundnuts | 4.0 <sup>a</sup> |
| Wheat      | 1.6              |

SOURCE: FAO 1991.

<sup>a</sup>Percentage corresponds to 1986.

Between 1970 and 1974, the United States held 58 percent of the export market. This share declined to 39 percent between 1975 and 1979, with Australia increasing its market share. From 1980 to 1984, the United States held between 55 percent and 62 percent of the wheat export market, with the balance held by Australia. In 1985 and 1986, the U.S. share dropped to 30 percent, with Australia exporting a 40 percent share and Canada exporting a 17 percent share. This shift in market shares reflects Indonesia's greater reliance on commercial rather than concessionary imports after 1985.

Corn. Indonesia's corn production accounts for a small share of total world production. In 1988, its share of total world production was 2.7 percent (Table 9, Figure 6). The largest producer countries were the United States, China, and Brazil, accounting for 46 percent of total world production (Figure 6). Indonesia's corn exports were less than 1 percent of 1988 total world exports

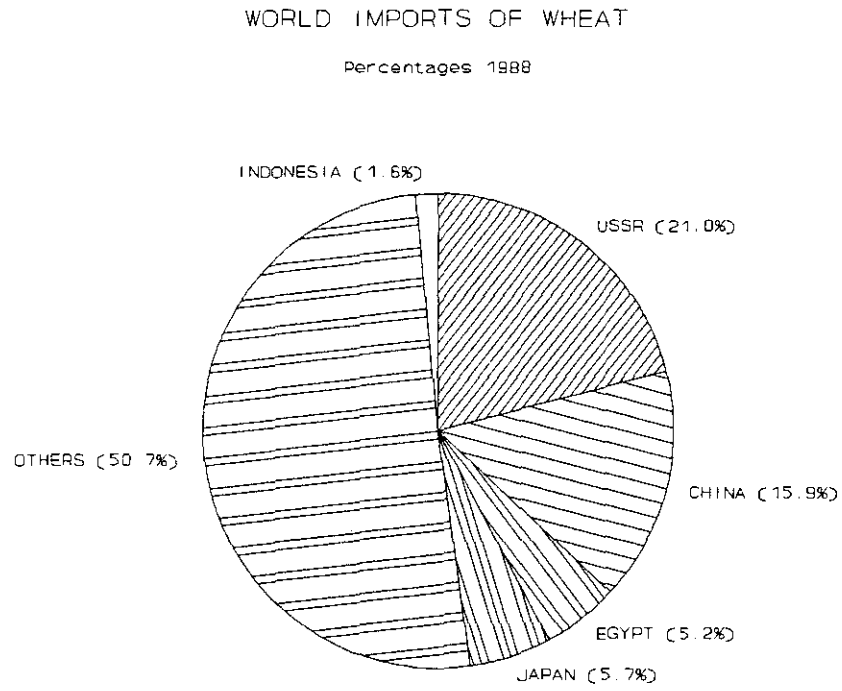


Figure 5. World imports of wheat.

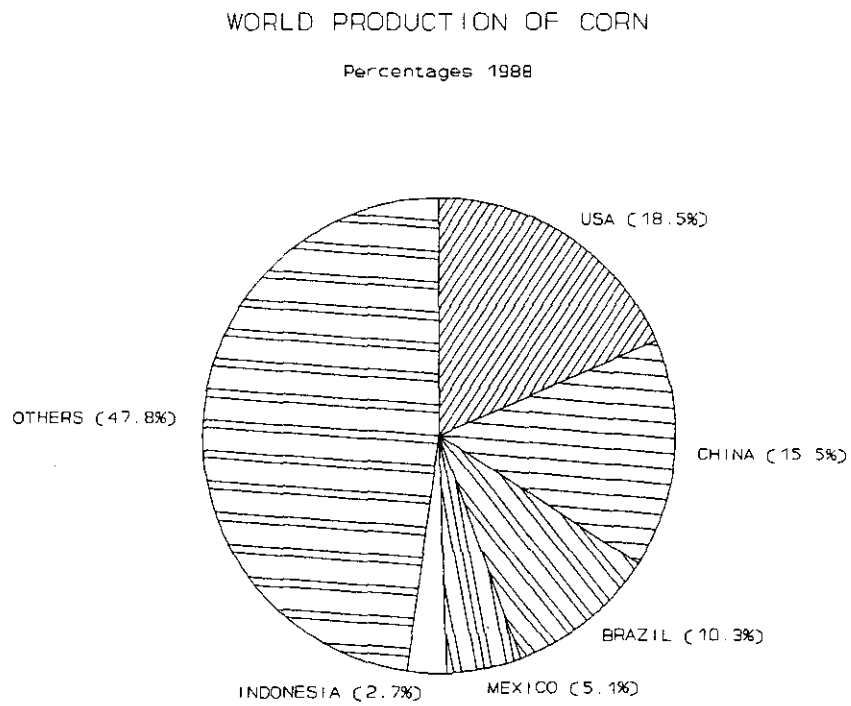


Figure 6. World production of corn.



(Table 10, Figure 7). The largest exporter is the United States, accounting for 71 percent of total world exports (Figure 7). U.S. price policies and weather are the dominant forces in the world corn market. Unusually high or low U.S. export prices have a significant impact on corn imports or exports from or into Indonesia, unless the government intervenes.

Indonesia's corn imports accounted for 0.1 percent of total world imports in 1988 (Table 11, Figure 8). The main importers were Japan and the USSR, together accounting for 43 percent of total world imports.

Corn exports represented an average of 6 percent of domestic production between 1970 and 1974, but were less than 1 percent between 1976 and 1986. There were no corn imports from 1970 to 1975. Between 1976 and 1986, corn imports represented approximately 2 percent of domestic consumption.

Corn production could be significantly increased with improved technology, thereby creating exportable surpluses because domestic demand is not expected to keep pace with this potential.

Cassava. In 1988, Indonesian cassava production represented 11 percent of total world production (Figure 9). Indonesia is the second largest exporter of cassava, but it is well behind Thailand's 84 percent share of total world exports (Figure 10). Indonesian cassava exports represented between 3 percent and 8 percent of domestic production between 1975 and 1986.

Indonesia does not import any cassava (Figure 11). Instead, cassava is exported as gapek and starch. In the past few years, exports of cassava pellets for animal feed have replaced starch. Indonesia is the second largest exporter of gapek. Nevertheless, Indonesia has only limited policy influence on world gapek trade. The big importers of gapek (EC member countries) are the countries that influence world prices. Indonesian cassava trade is thus determined in part by political and economic events within and among developed countries. For instance, U.S. agricultural policy, especially with respect to corn, could have a significant impact on starch prices.

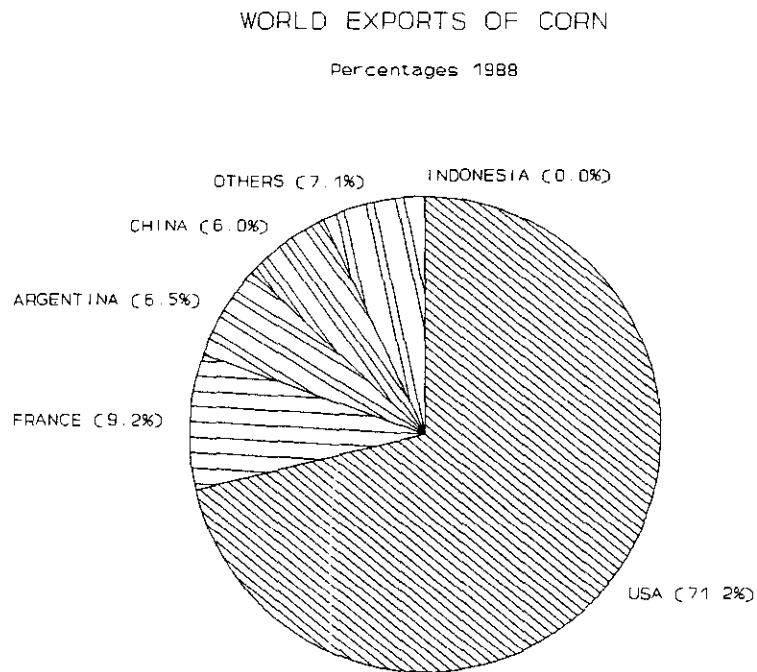


Figure 7. World exports of corn.

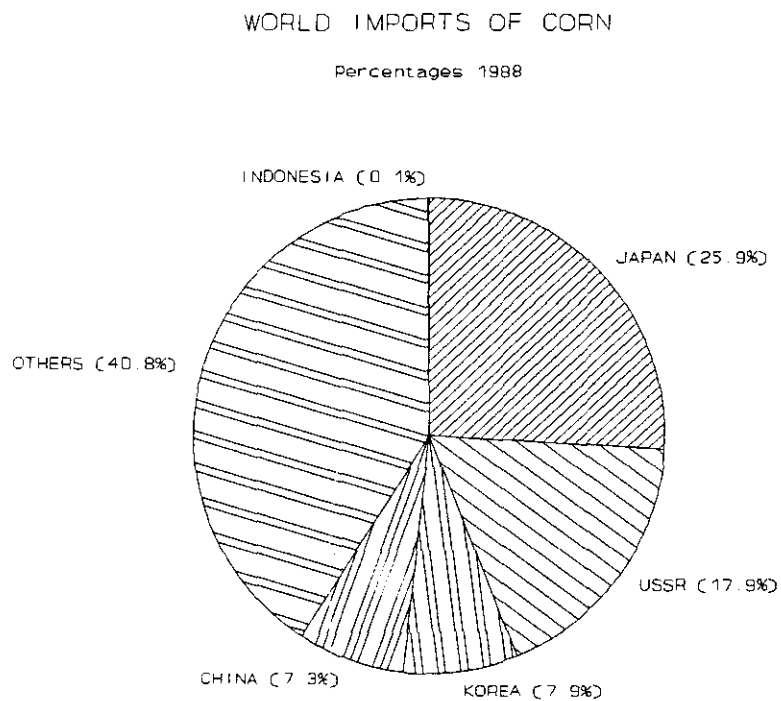


Figure 8. World imports of corn.

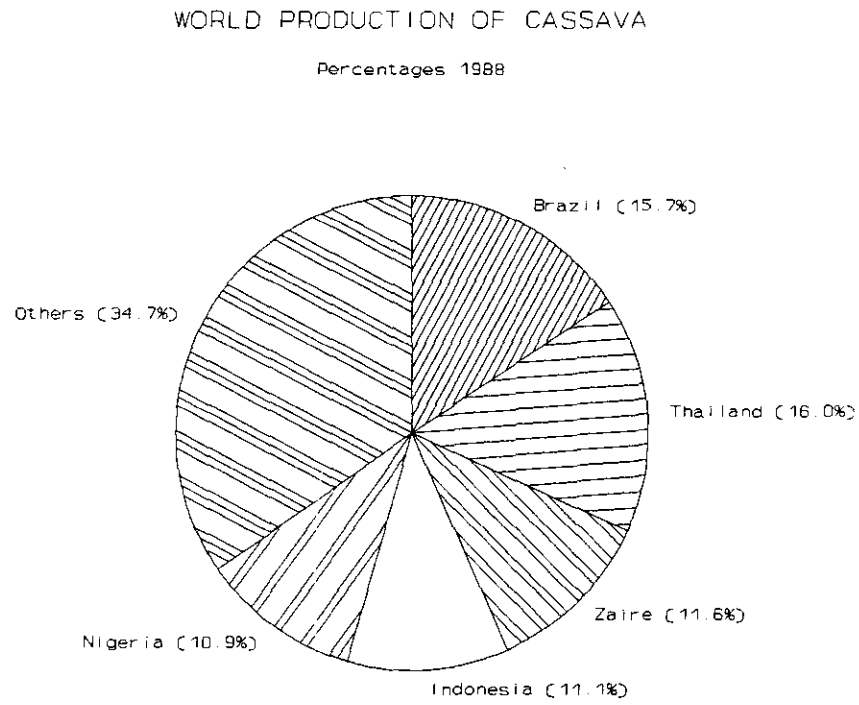


Figure 9. World production of cassava.

## WORLD EXPORTS OF CASSAVA

Percentages 1988

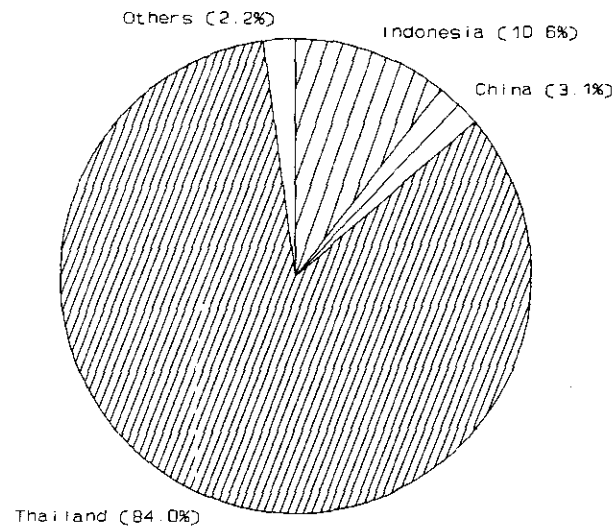


Figure 10. World exports of cassava.

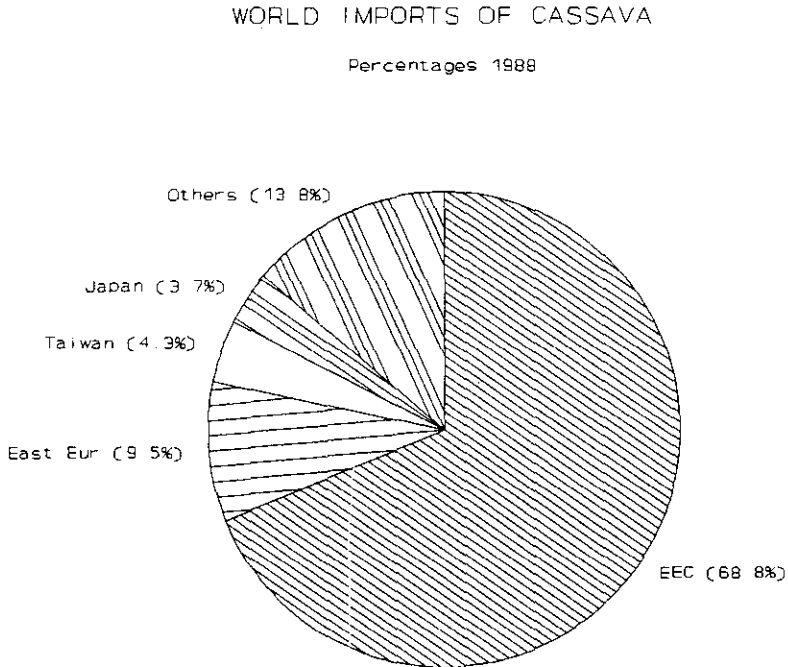


Figure 11. World imports of cassava.

Natural Rubber. In 1988, Indonesia was the world's second largest producer of natural rubber, representing 25 percent of total world production. The largest producer was Malaysia, also the second largest exporter with 27 percent of total world exports (Figures 12 and 13).

Tea. In 1988, Indonesia's tea production represented 6 percent of total world production and 9 percent of total world exports. The largest tea producers and exporters are India, China, Sri Lanka, and Kenya, together accounting for 65 percent of world production and 75 percent of world exports (Figures 14 and 15).

Palm Kernel Cake. In 1988, Indonesia was the second larger producer of palm kernel cake in the world (Figure 16). In 1986, it also was the second largest exporter, with a 14 percent share of total world production. The largest exporter was Malaysia, with a 74 percent world share (Figure 17). The largest importers were the Netherlands and Germany (Figure 18); these two countries are most responsible for determining prices and quantities according to agreements with other EC countries.

Soybeans. In 1988, Indonesia's soybean production accounted for 2.2 percent of total world production (Table 9, Figure 19). The largest producers were the United States, Brazil, and China (Figure 19). Although Indonesia's soybean imports represent a small proportion of total world imports (Table 11, Figure 20), they are between 20 percent and 70 percent of total domestic production for 1977 through 1986. This means that Indonesia's imports depend on world market fluctuations caused not only by policies in the largest producing countries but also in the largest importing countries. In 1986, the largest importers were Western Europe, Japan, China, and the USSR (Figure 20).

It is important to note that because world soybean demand is increasing rapidly, both for human consumption and animal feed, Indonesian soybean imports should increase.

WORLD PRODUCTION OF NATURAL RUBBER  
Percentages 1988

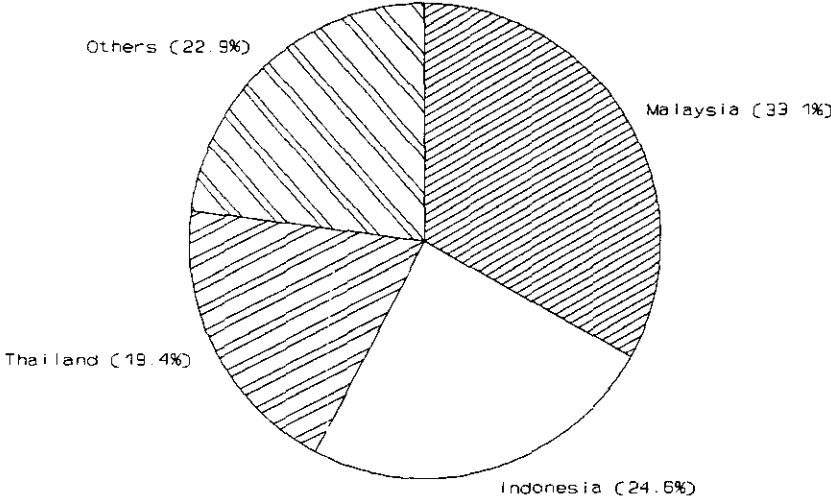


Figure 12. World production of natural rubber.



WORLD EXPORTS OF NATURAL RUBBER

Percentages 1988

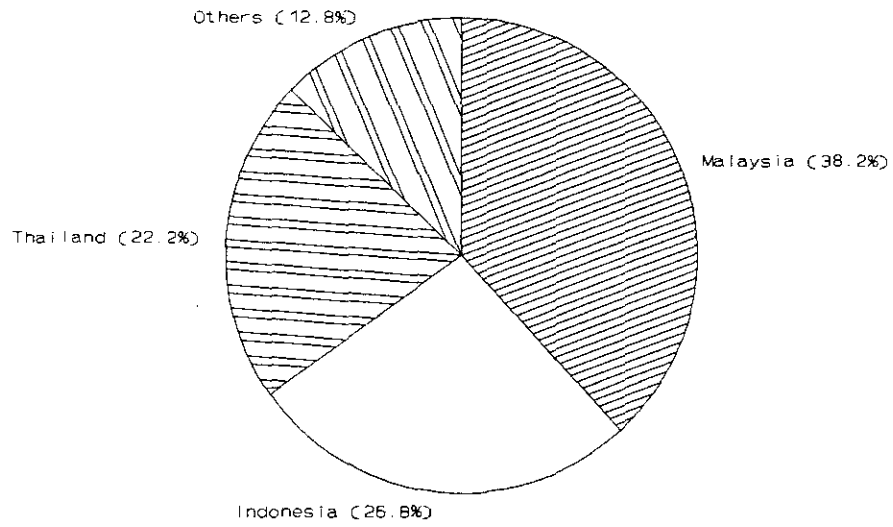


Figure 13. World exports of natural rubber.

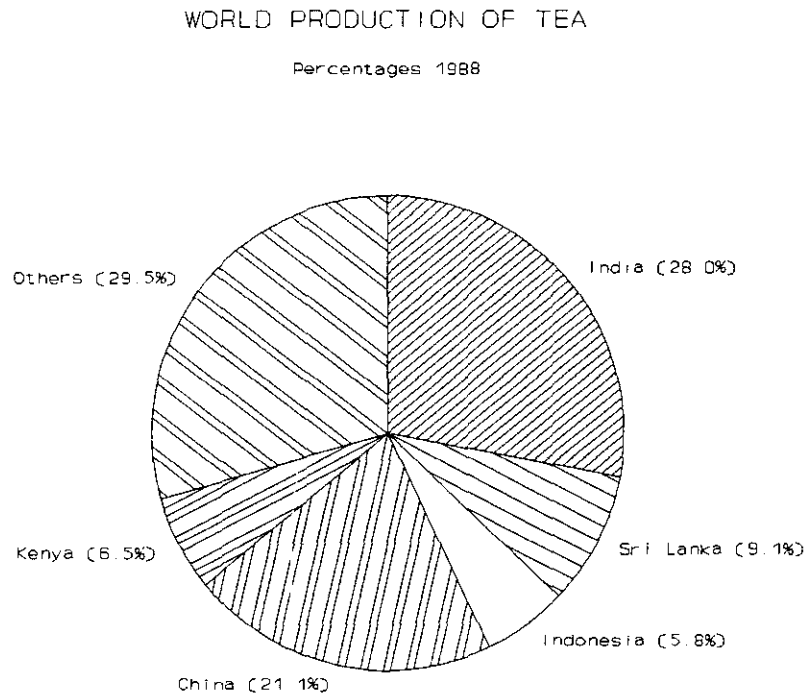


Figure 14. World production of tea.

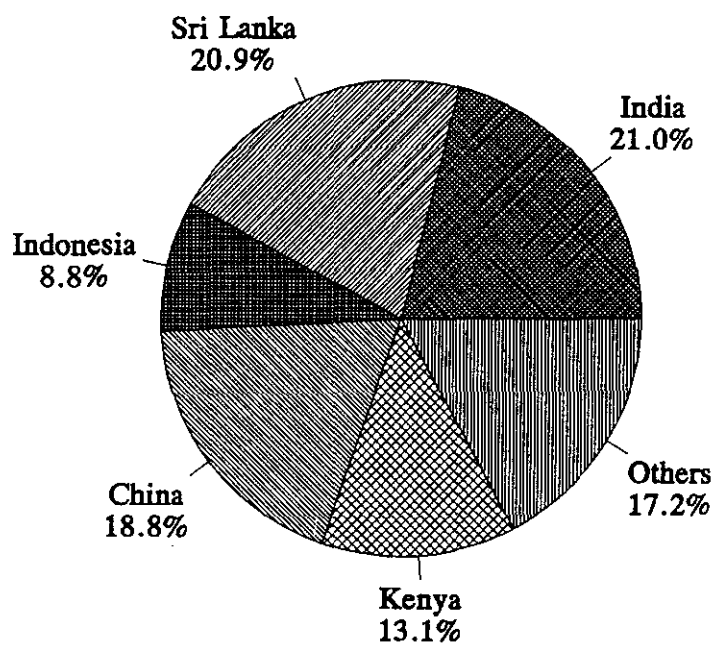


Figure 15. World exports of tea (percentages 1988).

## WORLD PRODUCTION OF PALM KERNEL CAKE

Percentages 1988

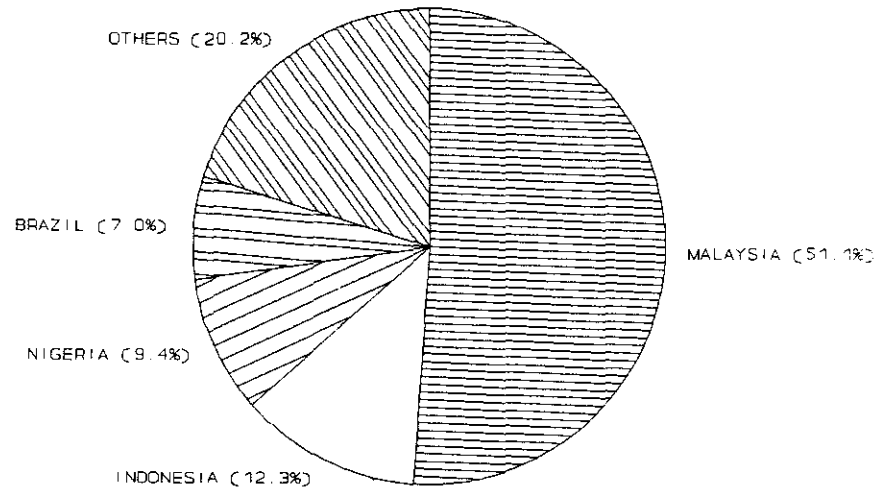


Figure 16. World production of palm kernel cake.

WORLD EXPORTS OF PALM KERNEL CAKE

Percentages 1986

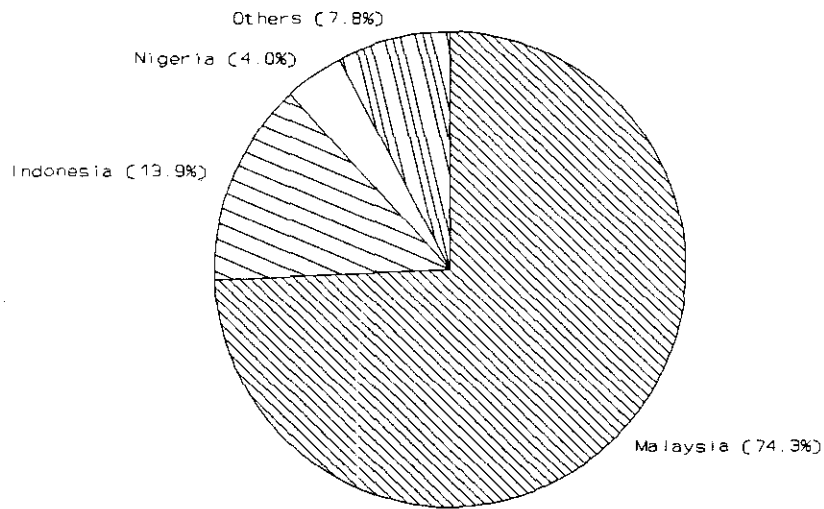


Figure 17. World exports of palm kernel cake.

## WORLD IMPORTS OF PALM KERNEL CAKE

Percentages 1986

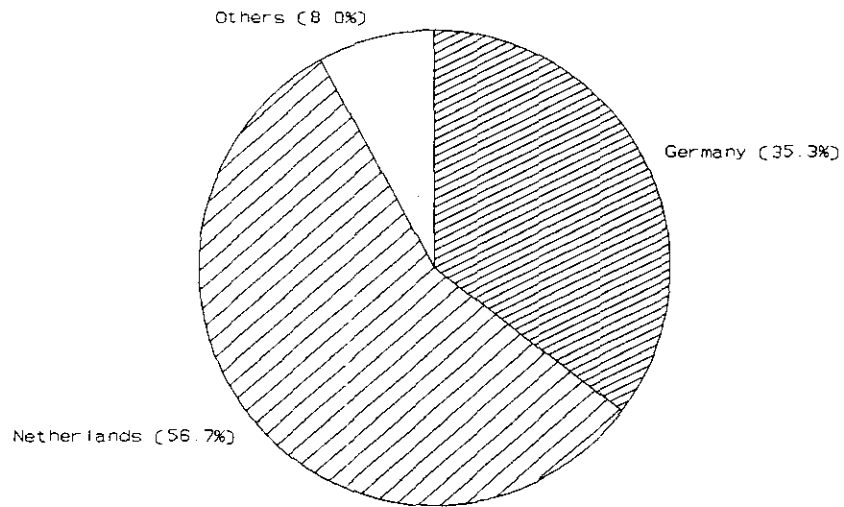


Figure 18. World imports of palm kernel cake.

## WORLD PRODUCTION OF SOYBEANS

Percentages 1988

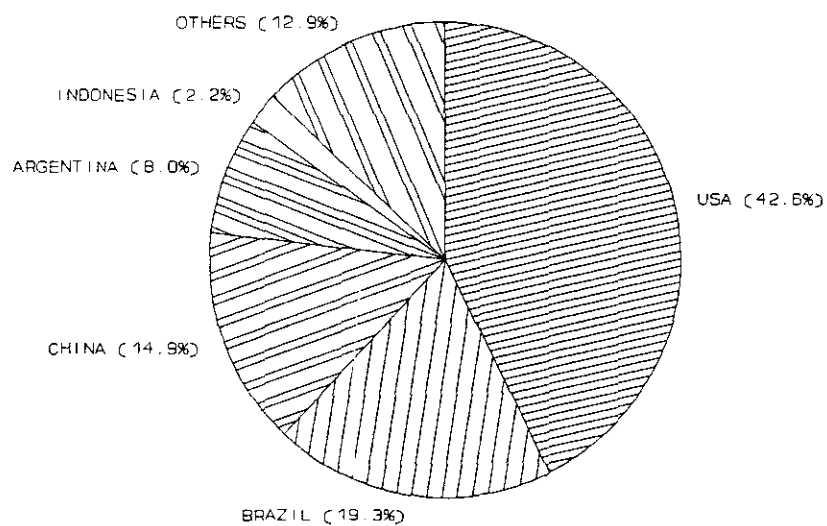


Figure 19. World production of soybeans.

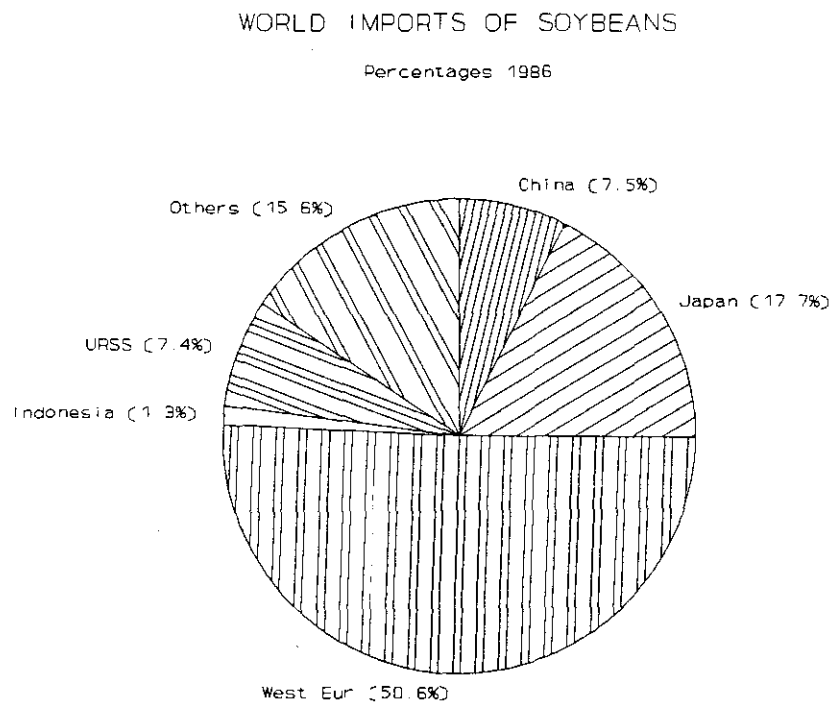


Figure 20. World imports of soybeans.



Groundnuts. Indonesia is the fifth largest producer of groundnuts in the world. Nevertheless, its share of total world groundnut production was 3 percent in 1988 (Table 9, Figure 21). The largest producer was India. In 1986, Indonesia's groundnut imports were 4 percent of total world imports (Table 11, Figure 22). There were no major importers.

On average, groundnut imports represented approximately 10 percent of domestic consumption between 1979 and 1986. Between 1970 and 1978, imports were almost zero. There were no exports between 1982 and 1986, and between 1971 and 1981 exports represented an average of less than 1 percent of total domestic production.

### **Current Agricultural and Trade Policies**

Indonesian price policy consists of a floor price high enough to stimulate production, a ceiling price to ensure reasonable prices to consumers, and sufficient difference between these two prices to give traders and millers a reasonable profit.

#### **Floor Prices**

Since 1970, the government has fixed the floor price of paddy to prevent prices from falling below a certain level during the harvest. Support prices before 1973-74 were determined by a farm formula relating the support price of paddy to the urea price. Since 1973-74, prices have been determined by an incremental cost-benefit ratio. Minimum support prices in Indonesia are fixed for two main food crops, rice and corn, but not for all commodities.

Procurement of rice at support prices and maintenance of floor prices are accomplished by the National Logistics Agency (BULOG), which is authorized to maintain buffer stocks in storage facilities throughout the country. The price support system in Indonesia is represented by Figure 23.

## WORLD PRODUCTION OF GROUNDNUTS

Percentages 1988

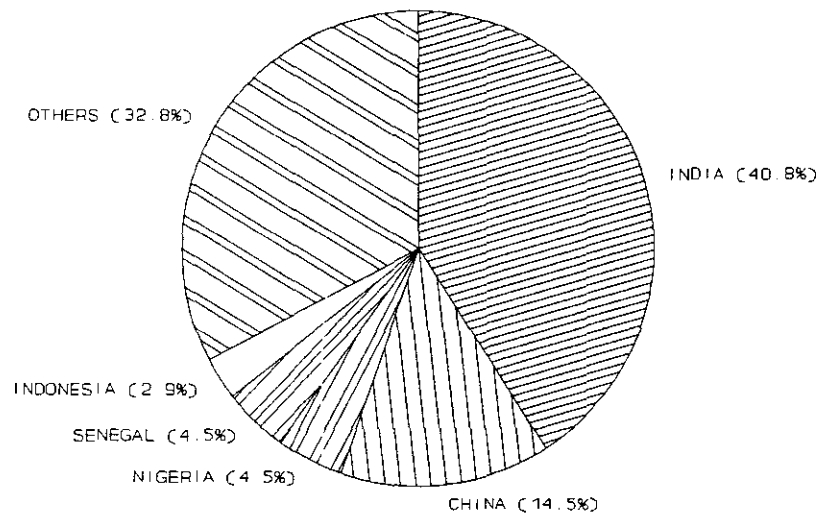


Figure 21. World production of groundnuts.

## WORLD IMPORTS OF GROUNDNUTS

Percentages 1986

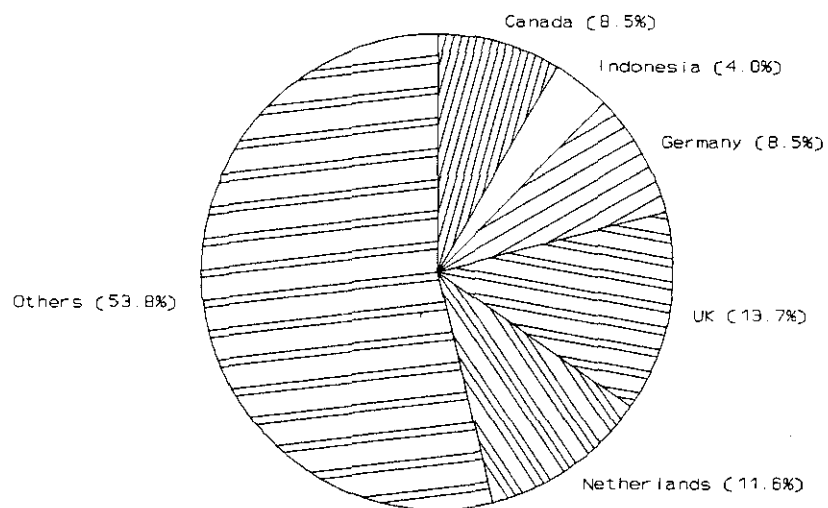


Figure 22. World imports of groundnuts.

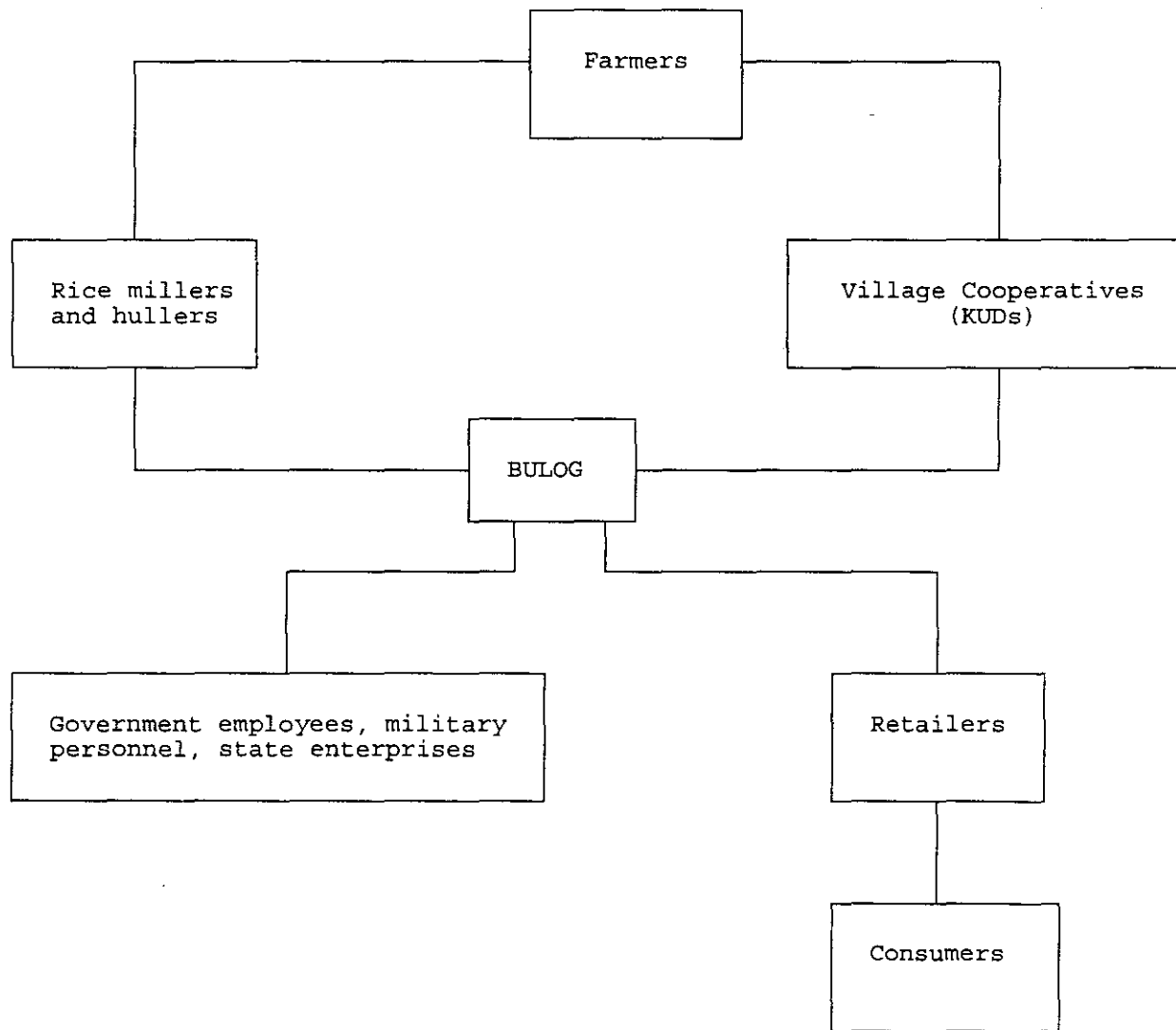


Figure 23. Indonesian price support system.

The village cooperatives (KUDs) are the agency that maintains floor prices and acts as a guarantee market for farmers by paying support prices at the farm level. The BULOG fully supports the KUDs by maintaining the floor price, functioning as a guarantee market for the KUDs, and paying them support prices.

This price support policy has affected various crops in different ways. BULOG was able to maintain farm prices for rice at the announced levels (Table 12). This was one of the key factors in a high production growth rate that helped the country achieve self-sufficiency and create export surpluses for the world market after being the world's largest rice importer in the early 1970s. But the Indonesian price policy for corn was not as successful.

### **Price Ceilings**

The objective of the price policy in the 1960s and early 1970s was to maintain reasonable rice prices for consumers through ceiling prices in urban areas. Consumer prices were held below world market prices by subsidizing BULOG imports. On average, from 1969 to 1976, the domestic price was 30 percent less than the border price.

This policy of setting low domestic rice prices was gradually superseded by the government's desire to promote rice production. Domestic prices relative to world prices have increased steadily since the last half of the 1970s. Even when world prices fell in the early 1980s or when they increased in 1987 and 1988, domestic price levels were above world prices (Table 13).

### **Input Price Policy**

Since 1968, the prices of seeds, water, fertilizer, pesticides, fuel, and machinery have been reduced at various times by price subsidies. In particular, the fertilizer subsidy, along with the price floor, have been key incentives for increased rice production. The combination of a faster increase in

Table 12. Rice support and urea subsidized prices

|      | Rice Support<br>Price | Urea Subsidized<br>Price | Ratio of<br>Rice Price to<br>Urea Price |
|------|-----------------------|--------------------------|---|
|      | (Rupiahs/kg)          |                          |   |
| 1975 | 59                    | 60                       | 0.98                                    |
| 1976 | 69                    | 80                       | 0.86                                    |
| 1977 | 71                    | 70                       | 1.01                                    |
| 1978 | 75                    | 70                       | 1.07                                    |
| 1979 | 85                    | 70                       | 1.21                                    |
| 1980 | 105                   | 70                       | 1.50                                    |
| 1981 | 120                   | 70                       | 1.71                                    |
| 1982 | 135                   | 70                       | 1.93                                    |
| 1983 | 145                   | 90                       | 1.61                                    |
| 1984 | 165                   | 90                       | 1.83                                    |
| 1985 | 175                   | 100                      | 1.75                                    |
| 1986 | 175                   | 125                      | 1.40                                    |
| 1987 | 190                   | 125                      | 1.52                                    |
| 1988 | 210                   | 135                      | 1.56                                    |
| 1989 | 250                   | 165                      | 1.52                                    |
| 1990 | 270                   | 185                      | 1.46                                    |

SOURCE: Pearson et al. 1991.

Table 13. Domestic Indonesian and world rice prices

| Year | World Rice Price | Domestic Rice Price | Ratio of World Price to Domestic Price |
|------|------------------|---------------------|--|
|      | (Rupiahs/ton)    |                     |  |
| 1975 | 131,739          | 97,010              | 1.36                                   |
| 1976 | 96,443           | 118,730             | 0.81                                   |
| 1977 | 99,886           | 127,100             | 0.79                                   |
| 1978 | 212,593          | 157,470             | 1.35                                   |
| 1979 | 194,953          | 196,370             | 0.99                                   |
| 1980 | 250,519          | 221,820             | 1.13                                   |
| 1981 | 268,330          | 242,590             | 1.11                                   |
| 1982 | 173,630          | 273,960             | 0.63                                   |
| 1983 | 245,120          | 328,220             | 0.75                                   |
| 1984 | 253,107          | 347,150             | 0.73                                   |
| 1985 | 219,935          | 359,480             | 0.61                                   |
| 1986 | 223,095          | 356,416             | 0.63                                   |

SOURCE: Tabor et al. 1988.

the price floor and a slower increase in fertilizer prices gave farmers an incentive to increase production (Tables 12 and 14).

Domestic fertilizer prices are subsidized by the government, even though this subsidy is a significant strain on the domestic budget (Tables 15 and 16). These high costs and declining oil

Table 14. Indexes of producer prices and fertilizer prices

|           | Crops                    | Fertilizers |
|-----------|--------------------------|-------------|
| West Java | (price indexes, percent) |             |
| 1976      | 100                      | 100         |
| 1977      | 114                      | 90          |
| 1978      | 123                      | 91          |
| 1979      | 144                      | 92          |
| 1980      | 166                      | 95          |
| 1981      | 180                      | 96          |
| 1982      | 206                      | 99          |
| 1983      | 258                      | 124         |
| 1984      | 284                      | 129         |
| 1985      | 300                      | 139         |
| 1986      | 346                      |             |
| 1987      | 393                      |             |

SOURCE: FAO.

revenues have pressured the government to partially or totally eliminate these subsidies. Because the vast majority of fertilizer is used for rice, changes in fertilizer price policy will have the greatest impact on rice production. Nevertheless, it is expected that production of palawija crops (such as corn, sweet potatoes, and cassava) will also be affected.



Table 15. Annual fertilizer subsidy, 1981 through 1989

|         | Million Rupiah  |
|---------|-----------------|
| 1981-82 | 265,980         |
| 1982-83 | 325,040         |
| 1983-84 | 294,830         |
| 1984-85 | 702,389         |
| 1985-86 | 447,100         |
| 1986-87 | 467,200         |
| 1987-88 | NA <sup>a</sup> |
| 1988-89 | 0               |

SOURCE: FAO.

<sup>a</sup>NA = not available.

### Public Investment Policy

Improved and modernized technologies have resulted from investments in marketing infrastructure (roads and ports) and irrigation systems, especially on Java. Investments in irrigation have been critical to achieving success in new technology adoption because there are new seed varieties available for use with irrigation. Data on additions to irrigated area from public investments are reported in Table 17. The additions to irrigated area, including both rehabilitated and new areas, were only about half as large in the mid-1980s as they were in the late 1970s and early 1980s. This reduced public investment in irrigation resulted from the declining share of development expenditures.

Table 16. Fertilizer subsidies for nitrogenous fertilizers

|         | Urea                     |                          | Ammonium Sulphate        |                          |
|---------|--------------------------|--------------------------|--------------------------|--------------------------|
|         | (dollars per metric ton) | (Rupiahs per metric ton) | (dollars per metric ton) | (Rupiahs per metric ton) |
| 1981-82 | 91                       | 58,503                   | 493                      | 316,818                  |
| 1982-83 | 93                       | 70,343                   | 487                      | 367,884                  |
| 1983-84 | 109                      | 108,380                  | 534                      | 529,702                  |
| 1984-85 |                          |                          |                          |                          |
| 1985-86 | 139                      | 156,374                  | 645                      | 724,495                  |
| 1986-87 | 102                      | 156,374                  | 471                      | 724,495                  |
| 1987-88 | 91                       | 150,000                  | 359                      | 595,000                  |
| 1988-90 |                          |                          |                          |                          |

SOURCE: FAO.

### Macroeconomic Policies

Effects of the exchange rate policy have been different for different commodities. Rice production has not been significantly affected by an overvalued exchange rate because rice and fertilizer prices are set by government policy and supported by import and export quantity restrictions. Therefore, rice farmers are insulated from any taxing effect of overvalued exchange rates because prices for their output and main input are determined by commodity policies, no matter how world prices and the exchange rate fluctuate. This is not the case for cassava and corn because these crops do not have price supports and they do not use fertilizers as intensively as does rice production. So there are no compensatory effects to offset the implicit tax on cassava and corn farmers from an overvalued exchange rate.

Table 17. Additions to irrigated area from public investments

|         | Rehabilitated    | New |
|---------|------------------|-----|
|         | (1,000 hectares) |     |
| 1975-76 | 105              | 89  |
| 1976-77 | 117              | 63  |
| 1977-78 | 112              | 41  |
| 1978-79 | 85               | 112 |
| 1979-80 | 95               | 123 |
| 1980-81 | 112              | 113 |
| 1981-82 | 94               | 118 |
| 1982-83 | 69               | 57  |
| 1983-84 | 24               | 26  |
| 1984-85 | 87               | 69  |
| 1985-86 | 30               | 61  |
| 1986-87 | 37               | 22  |
| 1987-88 | 153              | 60  |
| 1988-89 | 404              | 24  |

SOURCE: Pearson et al. 1991.

Budget problems have affected all crops (and mainly rice) because of the limited availability of public investment funds for agriculture. This shortage of funds has meant less available credit, less investment in irrigation, and less investment in productive and marketing infrastructure that mainly benefit rice production.

**Border Measures**

To improve domestic availability and internal prices, the Indonesian government has used both fiscal (import and export taxes) and quantitative (quotas and licensing) controls.

BULOG is the sole importer of rice, corn, wheat, and soybeans. Exports are handled through restricted licensing. For peanuts and mungbeans, import and export licensing are used to limit the effect of international markets on the domestic economy.

Historically, Indonesia has protected the domestic rice market from the world market, with the degree of protection diminishing as world market prices reach cyclical peaks. Rice imports were used

Table 18. International trade and BULOG rice stocks

|      | Rice<br>Exports | Rice<br>Imports | BULOG<br>Closing<br>Stock 3/31 | BULOG<br>Closing<br>Stock 7/31 |
|------|-----------------|-----------------|--------------------------------|--------------------------------|
|      | (1,000 tons)    |                 |                                |                                |
| 1980 |                 | 2,027           | 886                            | 2,254                          |
| 1981 |                 | 525             | 1,192                          | 2,385                          |
| 1982 |                 | 300             | 1,593                          | 2,750                          |
| 1983 |                 | 1,155           | 911                            | 1,550                          |
| 1984 | 11              | 375             | 1,442                          | 2,925                          |
| 1985 | 406             |                 | 2,316                          | 3,374                          |
| 1986 | 231             |                 | 2,131                          | 2,144                          |
| 1987 | 119             | 120             | 1,821                          | 2,493                          |
| 1988 | 20              | 21              | 769                            | 1,383                          |

SOURCE: BULOG.

to keep consumer prices stable and as a source of government financing. Table 18 shows the changes in BULOG's rice stocks. Wheat imports are monopolized by BULOG.

Until the mid-1980s, the government restricted corn trade by controlling export and import licenses and by taxing corn exports and imports. In 1984, licensing restrictions were the major government policy instruments to restrict corn trade, as exporters were subject to licensing and BULOG was the sole licensed importer. There was no tax on corn exports and the tax on imports was waived for BULOG.

Cassava is exported in any volume and has the fewest domestic trade restrictions. Nevertheless, cassava exports are subject to an export quota imposed by the European Community.

### **Export Subsidies**

Exports subsidies for major exports are a direct result of differences between domestic prices and world prices. Indonesia's domestic price for rice was much greater than comparable world prices between 1982 and 1986; as a result, in 1985 and 1986, the Indonesian government was forced to pay very large export subsidies (approximately \$150 per metric ton) to move surplus rice onto the world market. No other commodity received any export subsidy.

### **Possible Impacts of a GATT Agreement**

One of the most important targets of Indonesia's current five-year development plan (Repelita V) is liberalizing the agricultural sector. Budget problems, macroeconomic imbalances, and the high costs of its intervention in agriculture are the main reasons for this policy change. This new policy of no intervention corresponds with the spirit of the General Agreement on Tariffs and Trade (GATT) negotiations.

Some policies are already changing to comply with the agreement but others may need to be changed. For instance, it has been clear that, in the past, the Indonesian government has reduced

price support levels in real terms and eliminated the subsidy on fertilizer prices. Table 12 shows how the ratio of rice price to urea price has decreased during the first half of the 1980s. The price ceiling on rice has been already eliminated and public investment in irrigation, subsidized credit, and marketing and productive infrastructure have decreased dramatically. All of these changes are positive steps toward complying with a GATT agreement.

To fully comply with an agreement, there must be a number of changes with respect to border measures, especially import licensing restrictions that allow the BULOG monopoly to import rice, corn, soybeans, and wheat. This practice has kept domestic prices for these commodities above world price levels, thereby favoring producers.

Eliminating these controls might be difficult because food security is very important to Indonesia. The government's objective is to ensure food availability at reasonable and stable prices for the urban population. At first, it would seem that eliminating these trade barriers would conflict with this objective. Nevertheless, Indonesian policymakers should understand that there will be short- and long-term effects.

Lifting these barriers would immediately decrease domestic prices to world levels. Lower prices would benefit consumers in the short run and potentially lower real wages in the long run. Lower real wages would increase Indonesia's competitiveness in international markets and attract domestic and foreign capital investment. Employment levels would increase, causing more equal income distribution.

Lower prices would also mean lower food production rents, which could lower domestic food production. This decrease could raise food security concerns. It has been estimated, for example, that real prices in Java must increase by at least 5 percent annually (along with additional irrigation and other infrastructure investment) to ensure rice self-sufficiency. A decreased production rate would cause Indonesia to again become a net importer of rice (Pearson et al. 1991). In addition,

other concerns would arise about rural unemployment and the redistribution of income between the urban and rural sectors and high- and low-income farmers. And in the long run, domestic corn and rice domestic production would tend to concentrate on a few large farms.

Based on these factors, Indonesian policymakers might argue that food should be exempt from import restrictions and price support policies to ensure food security because rice is the main dietary staple in Indonesia and because of their past dependence on world food supplies. In addition, the negative effects on income distribution, increased unemployment in rural areas, farm bankruptcy, social unrest, and price instability might also be addressed. But concerns may be lessened if positive short- and long-term effects can be demonstrated.

Indonesian policy makers must consider that a liberalized trading system would effectively contribute to food security. More disciplined and predictable world agricultural trade would reduce uncertainty, imbalances, and instability in world markets and stabilize export earnings and would help ensure a stable food supply at reasonable prices and optimal allocation of resources. By liberalizing rice trade, the Indonesian government would be ensuring a permanent and reliable domestic rice supply complemented with some imports so that long-run food security could be ensured with lower domestic prices.

It is important to note that the high growth rates of output and farm income observed in Indonesian agriculture were associated with increased rice production. This growth of rice production was possible because of a favorable economic environment that facilitated the adoption and availability of new technology for rice production. This environment was a combination of internal support policies and the large amount of money invested, with the benefits reaching most rice farmers whether they were small- or large-scale farmers. Perhaps, in other circumstances, without this combination of policies, the low-income farmers would not have benefitted from the government's involvement in agriculture.

Rural areas have a high incidence of poverty. Nevertheless, approximately three-fourths of Indonesian rice producers are in the middle- and upper-income categories, meaning that direct income transfers from rice policies mainly benefitted wealthy households rather than low-income households. Thus, it can be inferred that decreasing rice prices to world levels would adversely affect all rice producers, but low-income producers would be most affected. Income would be transferred rural to urban areas and from rural low- and middle-income groups to urban consumers. Nonproducing rice farmers would benefit from the lower rice prices, but the long run tendency would be toward lower incomes for low- and middle-income rural groups and higher income for the high-income rural groups.

What is important to note is that low-income farmers need additional support policies to compete with large-scale farmers. Low-income farmers do not have access to credit, work marginal land, do not have enough working capital, and use traditional rather than innovative agricultural practices. On the other hand, large-scale farmers would not need these additional support policies to benefit from a liberalized trading system. In other words, considering the dual nature of the Indonesian agricultural sector, where large, modern, capital-intensive farms compete with small, traditional, labor-intensive farms and where there is wide income and technological disparity between different regions, it can be concluded that small-scale farmers are going to benefit less and large-scale farmers are going to benefit most from trade liberalization. Under these conditions, it would be necessary to design some compensatory schemes for smaller-scale farmers to ease their losses.

Liberalizing trade would redistribute agricultural income, favoring the large, capital-intensive farms at the expense of low-income farmers. In general terms, we would expect a modernization of the Indonesian agricultural sector characterized by fewer large, economically efficient, capital-intensive farms; a well-developed labor market with low rural wages and an excess labor supply; and



high yields and production. This situation would also mean more competition in both the domestic and world markets for these large farms.

On the other hand, the large and economically efficient commercial farms that produce tea, coffee, rubber, and cassava for foreign markets would also improve their trade position and their export incomes because there would be no export restrictions (such as the export quotas imposed by the European Community on some processed cassava products). They would also benefit from a freely determined exchange rate, avoiding the rentability problems caused by an overvalued currency.

## REFERENCES

- Arndt, H. *The Indonesian Economy: Collected Papers*. Singapore: Chopmen, 1984.
- Booth, A. *Agricultural Development in Indonesia*. Sydney: Allen and Unwin. 1988.
- Falcon, W., W. Jones, and S. Pearson. *The Cassava Economy of Java*. Stanford, California: Stanford University Press, 1984.
- Food and Agriculture Organization. Commodity Review and Outlook. 1987-1988, 1988-1989, 1989-1990, 1990-1991.
- Food and Agriculture Organization. FAO Monthly Bulletin of Statistics 1984-1987.
- Food and Agriculture Organization. FAO Quarterly Bulletin of Statistics. 1988-1991.
- Food and Agriculture Organization. FAO Yearbook. Fertilizers. 1980-1986.
- Food and Agriculture Organization. FAO Yearbook. Production. 1980-1988.
- Food and Agriculture Organization. FAO Trade Yearbook. 1980-1986.
- Food and Agriculture Organization. Yearbook of Food and Agricultural Statistics. 1987.
- International Monetary Fund. Exchange Arrangements and Exchange Restrictions. Annual Report 1988.
- Manrique, J. A Methodology to Evaluate the Welfare Effects of Alternative Agricultural Policies in Urban Indonesia. Ph. D. Dissertation. Iowa State University, Ames, Iowa, 1991.
- Ministry of Agriculture. *Indonesia and its Food Crops Agriculture*. Jakarta: Agency for Agricultural Research and Development, 1986.
- Papanek, G. *The Indonesian Economy*. New York: Praeger, 1980.
- Pearson, S., W. Falcon, P. Heytens, E. Monke, and R. Naylor. *Rice Policy in Indonesia*. Ithaca and London: Cornell University Press, 1991.
- Muljana, B. The Role of Agricultural Exports in Indonesia's Economic Development. Ph. D. Dissertation. Iowa State University, Ames, Iowa, 1972.
- Tabor, S., K. Altemeier, B. Adinugroho, and N. Daris. *Supply and Demand for Foodcrops in Indonesia*. Jakarta: Directorate of Foodcrop Economics and Postharvest Processing, Ministry of Agriculture, 1988.
- Timmer, C. P. *The Corn Economy of Indonesia*. Ithaca: Cornell University Press, 1987.

United Nations. *International Trade Statistics Yearbook*. 1987.

World Bank. *World Development Report*. New York: Oxford University Press. 1981.