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AGRICULTURE IN *Indonesia*

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SUMMARY

Indonesia's tropical location and rich volcanic soils have made it a major producer of agricultural export crops, such as rubber, copra, palm oil, coffee, tea, spices, and tobacco. Agriculture is the main support of about three-fourths of Indonesia's population and contributes well over half of the value of all recorded exports. Rubber contributes over two-thirds of the value of agricultural exports.

Indonesia has two distinct agricultural sectors--the estate sector, using advanced capital-intensive techniques, and the smallholder sector, using traditional labor-intensive methods. Before World War II, the estate sector was the main producer of agricultural export crops, but by 1965 it was contributing only one-quarter of all foreign exchange earnings. The estate sector was hard hit by the Second World War and the revolution which followed. Since the nationalization of the estate industries, which began in 1957, export earnings from the estate sector have declined still further--a result of the loss of technical and managerial personnel as well as of investment capital. Meanwhile the smallholder's share of agricultural exports (mainly rubber) has been steadily rising and has reached well over 60 percent.

Java and Madura support more than two-thirds of Indonesia's population on less than one-tenth of its land, and grow mainly subsistence food crops such as rice, corn, and cassava. Farming plots on Java and Madura are very small, and it is estimated that 60 percent of the small farmers are share croppers. Implementation of legislation for land reform has met with many obstacles. The intensive cultivation of Java and Madura (mainly wet-rice) contrasts sharply with that of the Outer Islands, where the soil is not as rich and shifting-field agriculture occupies much of the arable land. Although some estates are on Java, most of the great plantation industries are located on Sumatra.

Rice growing occupies more than one-third of Indonesia's total area in crops. In 1965, rice production, estimated at 14 million metric tons, was up almost 7 percent over the previous year, and the outlook for 1966 was even higher. However, the Government has recently had severe difficulties in procuring sufficient rice for the vast rice distribution program to which it is committed, particularly for military and civil service personnel living in the cities. As a result of this as well as the rapidly increasing population (at least 2.3 percent annually), rice imports rose by about 52 percent between the periods 1955-59 and 1960-64, and by 1964 were exceeding 1 million tons annually. Although rice imports fell sharply in 1965 as a result of President Sukarno's rejection of trade and aid from the West, they were expected to recover somewhat in 1966. Thailand and Burma usually have led as sources of rice, and during the past 10 years, the United States, as a result of P.L. 480 shipments--especially of rice but also dried skim milk, wheat flour, and tobacco--has also become a leading supplier.

Following an aborted Communist coup on September 30, 1965, a new government came into power in Indonesia. In 1966, the new leaders ended the "confrontation" with Malaysia (initiated by President Sukarno in 1963) and the accompanying ban on trade with that country. The Government has requested resumption of trade and aid from the West, and many countries have offered aid. The United States has agreed to resume P.L. 480 shipments of cotton and rice, and agreed to supply in 1966 225,000 bales of cotton and 100,000 metric tons of rice. Indonesia's new leaders have also stated that priority will be given to improving agriculture.

AGRICULTURE IN INDONESIA

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PHYSICAL FEATURES

Location and Topography

The Republic of Indonesia is a chain of 3,000 islands off southeast Asia, all lying within 10° of the equator. Gracefully curving through tropic seas, it stretches more than 2,000 miles south and east from just off the west coast of mainland Malaysia almost to the northern tip of Australia. With a population of more than 107 million, Indonesia is the fifth largest nation in the world. Its land area is about 735,000 square miles, roughly equal to the United States east of the Mississippi.

Indonesia's islands are commonly divided into three groups--the Greater Sundas, the Lesser Sundas, and the Moluccas (formerly the Spice Islands); West Irian (formerly W. New Guinea) was added to these in 1963 (map, pp. 18 and 19). On a basis of regional differences, Java and Madura are generally considered separately from the Outer lands--Sumatra, Kalimantan (formerly Borneo), Sulawesi (formerly Celebes), the Moluccas, the Lesser Sundas, and West Irian.

Much of Indonesia is mountainous; a chain of volcanoes curves through Sumatra, Java, and the Lesser Sundas, and ends in the Moluccas. In the northern part of Java, the mountains descend to a wide, fertile plain; but in the south, they drop sharply to the rugged coast. Rivers descending Java's volcanic slopes supply the irrigation water for the terraces along their valleys and for the rich alluvial plains to the north. Along the west coast of Sumatra are high mountains; east of the mountains are plains and swampy lowlands. Mountains cover most of Sulawesi. Kalimantan has few mountains, and poorly drained coastal plains extend inland along the rivers.

Climate

In general, monsoons govern Indonesia's weather. Their duration and time of arrival vary with location. From December through February, the wet monsoon--having crossed the seas from the northwest--brings rain, especially to the windward slopes. From June through August, the dry monsoon, coming from the southeast across the Australian desert, brings a marked dry season to the southern part of the archipelago. As this monsoon moves northward toward the equator, its effect diminishes, and the northern part of Indonesia has frequent rain with little seasonal change. Only the Lesser Sundas and eastern Java have a well defined dry season. Western Java has a moderately humid tropical climate, with neither the problems of the more equatorial islands, such as wet or leached soils, nor those of the Lesser Sundas, which during the dry season are often damaged by wind erosion.

Temperatures in Indonesia are relatively stable throughout the year, being affected more by elevation than by season. In the lowlands, the daily temperature ranges between 73° F. and 90° F, and in the interior highlands, averages about 10 degrees less. The warmest and coolest monthly averages vary by only a few degrees.

Soils

There are six associations of soils in Indonesia: (1) Latosols and Red-Yellow Podzolic soils of steep hills and mountains; (2) Latosols, Red-Yellow Podzolic soils, Ando soils, and Regosols, of hills and plains; (3) Bog and Low-Humic Gley soils; (4) Grumusols; (5) Alluvial soils; and (6) Terra Rossa soils and Lithosols.

Latosols and Red-Yellow Podzolic soils are acid and low in plant nutrients and organic matter. On steep hills and mountains, this association of soils is suitable for forestry. Latosols on hills and plains are suitable for a variety of crops, but for good yields need nitrogen and phosphorus fertilizers. Red-Yellow Podzolic soils, found mainly in forests, are less favorable for plant growth. Ando soils, generally found at higher elevations than Latosols, derive from volcanic ash. They are low in phosphorus but have more plant nutrients than Latosols and are suitable for many crops, particularly tea, cinchona, and coffee. Regosols, composed of volcanic ash recently deposited on the slopes of young volcanoes, have a small amount of organic matter at the surface and a good supply of plant nutrients except nitrogen. The Regosols are suitable for most crops. Where they are used for wet rice, they have a layer of hardpan, generally at shallow depths. Where depth of the hardpan is one-half meter (20 inches) or more, sugarcane may be grown.

In their natural state, Bog and Low-Humic Gley soils support only forest, but they can be made suitable for agriculture by complex systems of drainage canals, ditches, and pumping systems to maintain the proper ground-water level. Bog soils are deficient in major and some minor elements, especially copper and molybdenum.

Grumusols occur on level-to-undulating plains, chiefly in northern Java. They become plastic and sticky when wet, and shrink and crack deeply when dry; consequently, they can be used only within a narrow range of moisture conditions. Grumusols are low in phosphorus, but where water is available respond to applications of superphosphate. Both irrigated and unirrigated crops can be grown on them.

Alluvial soils are among the most productive, and occur along all the larger streams throughout Indonesia, often among Bog and Low-Humic Gley soils. They produce a wide range of field crops, but yields could be improved through use of phosphorus and nitrogen fertilizers.

Sandy Regosols are generally found along the beaches, where coconut palms are grown on them.

Terra Rossa soils occur in association with Lithosols on severely eroded plains and hills. Lithosols occur also in the rougher parts of the mountains

among Latosols. Terra Rossa soils are well supplied with calcium and potassium. Where water is available, they produce well with addition of nitrogen and phosphorus fertilizers.

AGRICULTURE IN THE INDONESIAN ECONOMY

The tropical climate and physical features of Indonesia have made this country one of the world's largest producers of agricultural export crops. Indonesia supplies 30 percent of the world's rubber production. Agriculture is the main support of about three-fourths of the population, and the major part of Indonesia's foreign exchange earnings come from the export of agricultural products.

The most important agricultural export is rubber, but palm oil, copra, coffee, tea, spices, and tobacco are also important. Indonesia normally depends on imports for some foods, mainly rice, wheat flour, and dairy products.

During the 19th century, the Dutch developed a highly efficient estate agriculture, mainly in the Outer Islands, devoted to export crops. Meanwhile, the native Indonesians produced food crops and some export crops that fitted in with their food-crop cultivation. Thus, Indonesian agriculture became separated into two distinct sectors--estate agriculture that was technically advanced, well capitalized, and extensive in use of labor and land; and smallholder agriculture that was labor intensive (particularly in Java) and traditional in method.

The large plantations are located mainly on Sumatra. Java, with a population of at least 480 persons per square kilometer, produces mainly food-stuffs, although there are also plantations on Java producing rubber and tea.

From 1938 through 1955, estate export production dropped about 25 percent, mainly as a result of the war and the revolution. Since 1957, when the newly independent Indonesian Republic began to nationalize foreign-owned estates, the estate sector has declined still further--a result of the loss of technical and managerial personnel, problems with squatters and labor, and lack of investment capital. Before World War II, the estate sector ranked first in the production of agricultural export crops. Following the war, the smallholder sector was soon supplying well over half the total agricultural exports, and by 1962, its share of these exports (mainly rubber) was 60 percent. In 1965, only one-fourth of all foreign exchange earnings originated in the estate sector.

POPULATION AND LAND

Land Use

On Java and Madura, where the soil is most fertile and best suited for growing rice, more than two-thirds of Indonesia's population live on less than one-tenth of the country's land. Smallholder cultivation on these islands is extremely intensive, contrasting sharply with that prevailing in the Outer Islands.

Although data on land use are neither complete nor reliable, they indicate that in 1961 the total area cultivated by small growers represented nearly 11 percent of Indonesia's land area including West Irian, while the area in estates was less than 1 percent. About 42 percent of the smallholder land and 36 percent of the land in estates was located on Java and Madura (table 1).

The area in estates for all Indonesia declined 31 percent between 1939 and 1961. Of recorded planted area in 1961, rubber accounted for 60 percent, oil palms for about 12 percent, tea and coffee for 14 percent, sugarcane for over 7 percent; and coconut palms, tobacco, hard fibers, cocoa, and cinchona accounted for most of the remaining 7 percent.

Table 1.--Use of agricultural land, 1961

Category <u>1/</u>	Java and Madura <u>2/</u>	Outer Islands <u>3/</u>	Total <u>3/</u>
- - - - - 1,000 hectares - - - - -			
Area planted by smallholders:			
Irrigated	3,486	<u>4/</u> 1,634	5,120
Unirrigated	<u>5/</u> 4,888	<u>6/</u> 10,000	14,888
Total	8,374	11,634	20,008
Area in estates:			
Cultivated	386	466	852
Uncultivated ...	241	631	872
Total	627	1,097	1,724
Grand total:	9,001	12,731	21,732

1/ Both categories of cultivated land are believed to exclude the area used by squatters.

2/ Smallholders' area in Java and Madura may be high.

3/ Excludes West Irian.

4/ 1963 census of smallholder agriculture.

5/ Includes fresh-water fishponds as well as gardens and compounds.

6/ Estimated, by allowing 0.3 hectare per person for area actually under cultivation (15). Underscored numbers in parentheses refer to items in Selected References, back cover.

Source: (8) except as otherwise stated.

On the other hand, smallholder-cultivated land for all Indonesia has expanded since 1938. Estimates for the amount of land in smallholdings on Java and Madura range from 5.6 million hectares (preliminary returns of the 1963 census of smallholders' agriculture) to 8.4 million hectares (official published series for 1962). While the discrepancy between the 1963 census

returns and the official published series has not been explained, less land is, in fact, under cultivation than was believed. However, on the basis of figures available, the extent of multiple cropping for smallholder agriculture on Java and Madura probably ranks with that of Taiwan and Egypt as the highest in the world.

In the Outer Islands, the smallholder area amounts to approximately 11.6 million hectares. Only about one-tenth of this land is under irrigation and shifting-field agriculture, called "ladang" in Indonesia, is more common. The ladang system is characterized by a rotation of fields rather than crops and by short periods of cropping followed by long fallow periods.

The ladang system of farming is well suited to a tropical lowland area where there is no marked dry season. The system, however, may break down where wasteful methods are practiced, when population pressures cause old plots to be reactivated too soon, or when the system is attempted in areas that are less tropical and insufficiently humid. When this occurs, erosion and savannah grass take over, turning the land into a "green desert." It is estimated that in the 1950's one-fifth of the uncultivated area of Indonesia was covered by this type of wasteland.

Much of the smallholder land of Outer Indonesia has been well managed, however, and in many cases, the land in fallow has been planted to tree and bush crops, such as coffee, coconuts, and pepper. However, for several decades the most important commercial crop grown by the smallholder in the Outer Islands has been rubber, since it is less demanding as to soil, climate, and maintenance than are coffee and pepper. Thus, shifting cultivation has in many instances given way to a more settled type of agriculture.

Nearly all shifting cultivation had disappeared from Java and Madura by the end of the 19th century, because the shortage of land and population pressure necessitated intensive cultivation of rice and other subsistence food crops. In Java, nearly one-half of the smallholders' crops are under irrigation and are planted on wet-rice terraces called "sawah." Wet-rice agriculture has the ability to respond to an increasing population through labor-intensive methods. Even without intensive care, a sawah, relying on nutrients carried by the rivers from high on the volcanic slopes, seems able to produce undiminished yields year after year.

Attempts to ease the population pressure of Java and Madura by promoting land settlement elsewhere in Indonesia date from 1905 when the first transmigration program was initiated. There have been various other attempts, but they have not alleviated the problem to any extent. There are plans for opening new areas (mainly by clearing land and building access roads) in southern Sumatra and central Kalimantan. However, transmigration programs are costly and require considerable organization and cultural adjustment, and the extent to which Outer Indonesia can support a larger population is not known. Undoubtedly, many areas are not capable of supporting more than they now do.

Size and Tenure of Holdings

According to the 1963 census of smallholder agriculture, farms on Java and Madura number nearly 8 million and average only 0.71 hectare each in size. In the Outer Islands, small holdings number a little over 4 million, but are larger in average size--1.69 hectares. About half of the farms of Java and Madura are less than one-half hectare in size, while in the Outer Islands, about half of the farms are from 1/2 to 2 hectares in size.

Where shifting cultivation prevails in the Outer Islands, the land belongs to the community. The parcel assigned to a cultivator and his family is considered his possession as long as he works the land.

In 1960, the Ministry of Agrarian Affairs estimated that 60 percent of the farmers of Indonesia were sharecroppers. In the more heavily populated parts of the islands, as in Java, this percentage is much higher. Sharecropping is responsible for high rents as well as fragmentation of farms. The sharecropper receives as little as 30 or 40 percent of the harvest and usually pays for seed and fertilizer out of his share.

Official sources show that from 1938 to 1961, the number of estates in Indonesia declined 30 percent, although the number in Sumatra alone declined only 18 percent. At the same time, the average size of estates for all Indonesia showed a sharp increase--from 1,035 hectares to 1,530 hectares.

Prior to nationalization of the foreign estates, only a small portion of the estate area was owned and operated by the Government. Most of the land of the estates was held by individuals or corporations as an agricultural concession, leased from the villages or principalities, or held under long lease from the Colonial Government.

Nationalization of Dutch businesses began in 1957, and was completed in 1959. Control of British estates was seized in 1964, U.S. estates in 1965, and Belgian, French, Swiss, and Danish estates in 1965. By June 1965, most foreign employees had lost their jobs, leaving a severe shortage of managerial and technically skilled people.

Land Reform

In an effort to improve conditions for the farmers, especially on crowded Java, Madura, Bali, and Lombok, the Indonesian Government has enacted land reform legislation to provide land for as many of the landless as possible and to reform tenancy and sharecropping practices. The Basic Agrarian Act Number 5 that took effect in September 1960 recognized the rights of landownership and inheritance for Indonesian citizens and restricted the property rights of non-Indonesians. It also limited the amount of land an individual may own and prohibited absentee ownership.

Some land registration has been conducted by the Government and redistribution was to have started at the end of the 1961/62 growing season. There have been many problems, such as lack of land surveys, opposition of landowners, and conflicting regional laws. Some progress was made in 1965,

but the problems are far from being solved. In addition, the number of the landless is so great in relation to the available land that only a small proportion would benefit from the redistribution program.

On the other hand, it appears that a reform of sharecropping practices could benefit a much larger number of farmers. A sharecropping law was passed in 1960 "to bring justice into the landlord-sharecropper relationship, to protect the weak sharecropper against the strong landowner, and to provide the sharecropper with adequate incentives for increasing production." This law set the ratio by which the yield may be divided between sharecropper and landlord, and stipulated that all agreements be written and registered. However, this law has not been generally enforced and, in addition, many landowners are cultivating their land themselves rather than continue to lease it under terms which have become less favorable to them. For this reason, many of the landless have lost their use-rights to the land, thus worsening conditions and adding to the tension over land reform.

Labor

It is estimated that about 70 percent of Indonesia's labor force of 46 million is employed in agriculture. In 1960, agricultural labor on estates, including temporary workers, accounted for only about 4 percent of all farm workers. On Java and Madura the estates recruit laborers from landless farmworkers or those whose holdings are too small to support them entirely; however, in the Outer Islands, the estates must import laborers. Although in Java rural unemployment is relatively low, about one-third of the rural labor force is estimated to be underemployed (fig. 1).

FARM PRACTICES

Since nationalization of foreign properties, productivity in the estate sector has declined. Although productivity has increased somewhat in the smallholder sector, it has not kept pace with the rapidly increasing population (particularly in Java); and per capita production for all Indonesia has decreased.

Intensity of Cultivation

On Java and Madura, labor input per hectare is relatively large compared with capital input; this is also true for shifting-field agriculture in the Outer Islands, if the land not actually under cultivation is excluded. Estate agriculture is extensive in its use of both capital and labor, but compared with smallholder cultivation employs considerably higher input of capital than of labor per hectare of land cultivated.

Irrigation

In rice cultivation, an adequate and well-controlled water supply is more important than the fertility of the soil. In the areas of Java, Madura, and Bali where there are modern irrigation systems, two and sometimes three rice crops a year are raised. Where the irrigation system is less efficient, the

rice crop may be followed by secondary dry crops, such as soybeans, sweet-potatoes, or corn. On Java and Madura, almost half of the area under cultivation by smallholders (estimated to be about 2.7 million hectares) is under irrigation.

The irrigation systems of Indonesia serve not only the water requirements of the crops, but also carry minerals and other water-borne nutrients. Irrigation is being used increasingly for crops other than rice; but on the estates, only sugar cane and tobacco are grown with irrigation.

The traditional irrigation systems of Java and Bali are fed by rivers from the mountains; they are based mainly on gravity flow, and wells and reservoirs are not common (fig. 2). These systems took many years and many man-hours to construct, and as the population increased, rather than extend cultivation into unirrigated areas cultivators have tended to divide holdings and cultivate them more intensively. This has contributed to the considerable fragmentation of holdings.

The most recent development plan (1961-68) called for irrigation and drainage projects involving rehabilitation of old systems and construction of new ones, and for large hydroelectric projects. One of the main projects is being built with both French and U.S. assistance. This is the multipurpose Djatiluhur complex, east of Djakarta, which by providing irrigation and flood prevention will add 160,000 hectares to the rice producing area. Rice production is expected to be increased by 300,000 metric tons. A smaller project near Malang in eastern Java is planned to increase rice production by 72,000 metric tons by 1969.

Soil Improvement

In the past, use of commercial fertilizer has been confined almost entirely to the estates and commercial market gardeners, not only because its cost has prohibited general use by small cultivators, but because farmers have found green manure crops to be an effective fertilizer. Green manure crops supply humus, which is important in areas of heavy rainfall where leaching of soil may be a problem. Because of the small number of livestock, there is little use of animal manure for fertilizer. Efforts by the Government to encourage use of commercial fertilizer by smallholders have resulted in some increased consumption. Although construction of fertilizer plants is included in development plans, most commercial fertilizer must still be imported.

In 1964, a U.S.-built 120,000-ton urea factory was opened in Palembang, Sumatra; however, during the first year of operation, problems of distribution and land transportation were so severe that hardly any of the fertilizer reached the fields, and most of it had to be exported. In 1966, the factory faced the prospect of having to curtail production for lack of foreign exchange to purchase spare parts.



Figure 1.--Krawang in Central Java, a rice-producing center, has a unique harvesting custom which allows a harvester to gather only one basketful from a field. It is believed that if he takes another from the same field, the godmother of good harvest would be displeased and would not grant as bountiful a harvest the next season. Thus more people are needed to do the work--wasting of time and labor



Figure 2.--Irrigated rice terraces of Java.

Machinery and Equipment

Indonesian farmers use very simple farm tools (figs. 3, 4, and 5). Some use animals for draft, but many farms are too small for plows and harrows. Machetes and simple wooden tools are used in the Outer Islands, and fire is used to clear the land.

Estates use some draft animals, but mechanization is limited because labor is cheap. Some tractors are used in land clearing and in the cultivation of certain fibers, sugar, and tobacco. However, in 1961, only 1,135 tractors were reported for all Indonesia.

The estates are generally self-sufficient and process their crops in their own industrial plants.

AGRICULTURAL PRODUCTION AND TRADE

Agricultural production in Indonesia falls into two categories--subsistence food crops and crops produced mainly for export. Livestock production is very limited. Official statistics concerning farm output are incomplete, and in some cases lacking, but suffice for a broad view of trends and magnitudes.

Average per capita food consumption is about 2,160 calories. Rice is the principal food, followed by cassava, and starchy foods provide a high proportion of all calories consumed. Proteins and fats are supplied mainly by the legumes and coconut palms since animal products are but a small part of the diet.

Subsistence Crops

Rice is Indonesia's most important crop. Its cultivation probably occupies more than one-third of the area in crops. Average annual production increased almost 10 percent between the periods 1955-59 and 1960-64 (table 2). Rice production in 1966, reached a new peak for the second year in a row--upwards of 15.3 million tons of paddy, an increase of more than 4 percent over 1965.

Rice imports increased about 52 percent between 1955-59 and 1960-64--a result of difficulties with the Government's rice procurement and distribution program as well as of the rising population. From 1960 to 1964 rice imports averaged more than 1 million metric tons. In August 1964, when President Sukarno rejected aid and other relations with the west, he proclaimed Indonesia self-sufficient in rice production, and in 1965, rice imports fell to 190,000 metric tons. However this venture into self-sufficiency was not successful, and 1966 imports are expected to reach 340,000 metric tons. Over the years, imports have generally cost Indonesia 20 to 25 percent of the money earned from all exports, excluding petroleum.

In an attempt to stimulate production and reduce the need for imports, in 1959-60 the Government initiated a program in which the important feature was



Figure 3.--Cultivating a rice field in Central Java.



Figure 4.--An Indonesian farmer beats out grain in a dug-out tree trunk with a pestle and his foot.



Figure 5.--Rice is winnowed against the wind using flat winnowing baskets woven from bamboo strips.

Table 2.--Selected crops: Production, 5-year averages, 1950-64

Crop	1950-54	1955-59	1960-64
----- 1,000 metric tons -----			
Subsistence:			
Rice, rough <u>1/</u>	10,773	12,004	13,196
Corn	1,828	2,104	2,913
Cassava	7,795	10,508	11,586
Sweetpotatoes	1,605	2,634	3,314
Soybeans	295	378	408
Peanuts	193	229	261
Commercial and export:			
Rubber-- <u>2/</u>			
Estates	260	252	216
Smallholders	492	457	427
Total rubber ..	752	709	643
Palm oil	159	155	144
Copra	<u>3/</u> 645	645	680
Tobacco	66	70	76
Coffee	<u>4/</u> 59	<u>4/</u> 71	113
Tea <u>5/</u>	<u>6/</u> 42	46	44
Sugar	643	940	902

1/ Production converted from rice on the stalk to rough rice on the basis of 80 rough = 100 on the stalk; data for 1950 not available.

2/ Figures for estate production represent reported production. No production figures are available for small holdings; these are obtained by subtracting estate production from total production, which is taken as being equivalent to total net exports plus an allowance for internal consumption of smallholders' rubber.

3/ 1952-54 average.

4/ 12 months ending September.

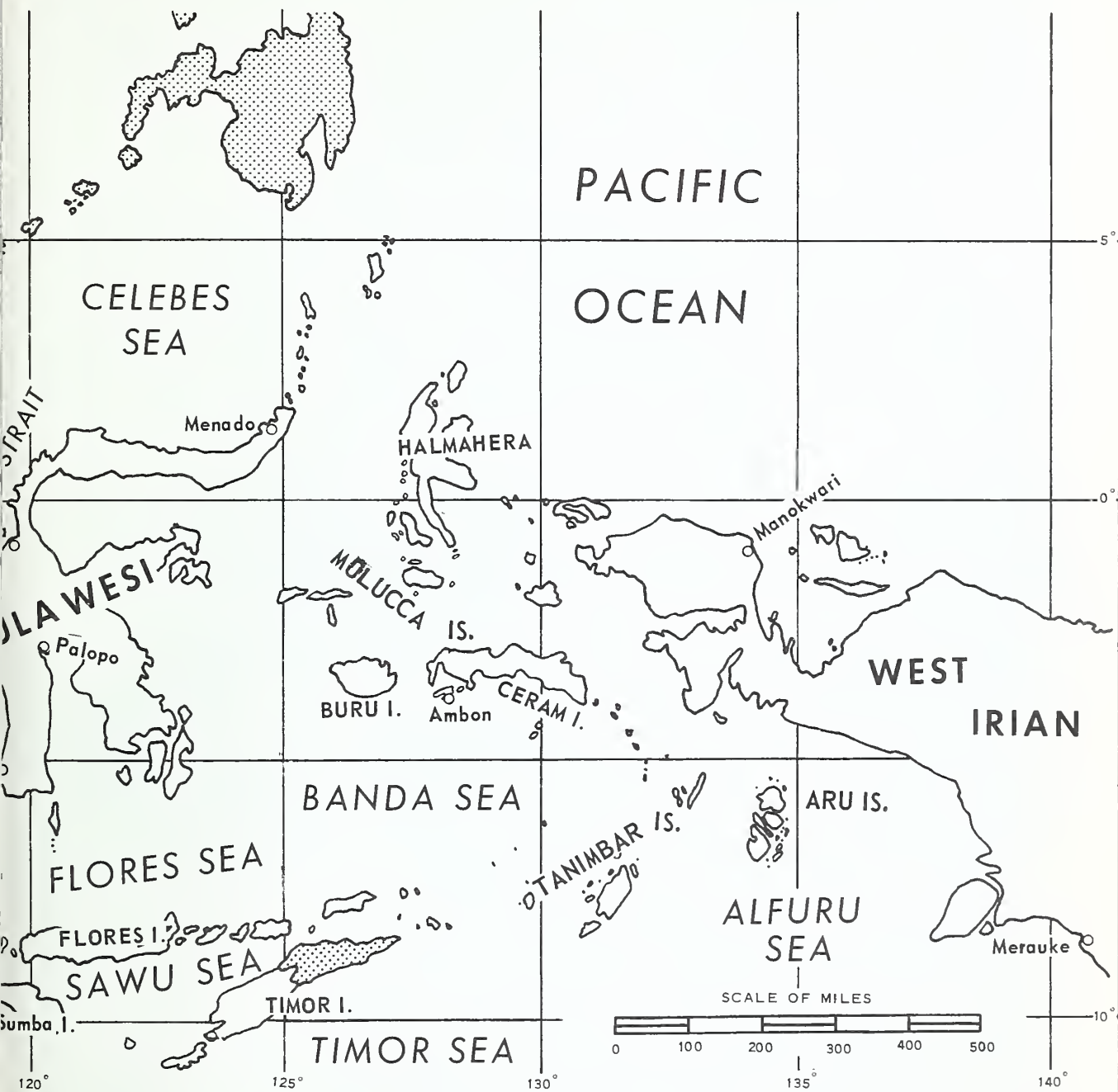
5/ Estate only.

6/ 1953 and 1954 only.

Source: (11).

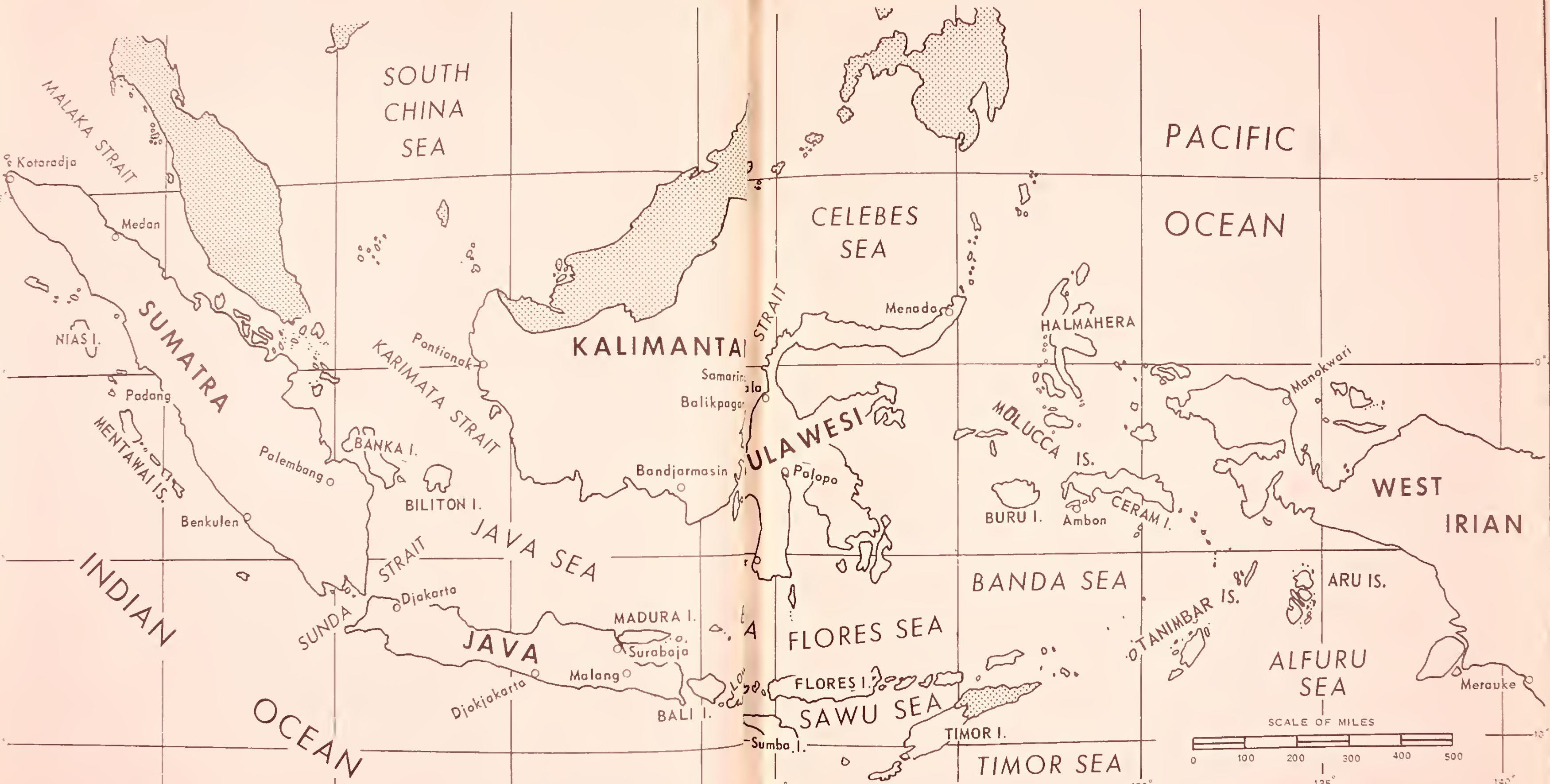


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INDONESIA



the establishment of rice paddy centers to make improved seeds, fertilizer, pesticides, and credit more accessible to the small farmer. The extent to which this program has been carried out is not known.

Government purchases generally represent one-third to one-half of total rice sold on the market. In 1965, the Government attempted to curtail its rice distribution program, but the policy was so unpopular that the old system has been partially restored for crop-year 1966-67. One-third of the urban population works for the Government and expects rice rations.

About 70 percent (6-7 million tons) of rice production usually remains within the rural sector and is consumed locally. Until 1964, the Government rice procurement price was almost always well below the market price. Since 1964, however, procurement has been allowed at locally determined market prices, although the Government must deduct transportation costs from the price it offers. The Government hoped to purchase about 1.5 million tons of rice from farmers in 1966. However, the Government may have had difficulty in obtaining this amount, in view of the tendency of the farmers to hoard rice against inflation.

In addition to problems of procurement, transportation of rice to Djakarta and other urban areas is a severe problem. Transportation facilities and roads are in serious disrepair. Also, the number of Chinese who formerly played a large part in extending credit to the farmers and in collecting and distributing rice has been decimated as a result of discriminatory measures both by the Government and by the public.

The most important rice-growing areas of Indonesia are Java, Madura, Bali, Lombok, parts of northern and southern Sumatra, and southern Sulawesi. Wet-rice cultivation is predominant on Java and Bali, in contrast with Outer Indonesia where dry-rice cultivation is more common. Dry-rice production is practicable only where there is enough land to permit rotational fallow, since dry rice exhausts the soil quickly and usually cannot be grown as an annual even where the soil is fertile. However, dry rice can be sown with other crops.

In Java, 1-month old seedlings which have been started in seedbeds are usually transplanted to rice paddies in October-November and harvested 4 to 6 months later (fig. 6). Rice growing in Indonesia is plagued by several insect pests and root disease, which cause serious damage. Rodents and birds are also harmful and often destroy large quantities of rice.

Cassava is the most important root crop, and is second only to rice in supplying energy in the people's diets. Since 1950, both area planted and production of cassava have increased sharply. Before World War II, Indonesia was the world's leading exporter of tapioca (made from cassava starch), but since then, exports have been insignificant.

Almost three-quarters of the cassava output during 1958-62 came from Java and Madura, where it is eaten as a supplement to rice; in some parts of the Outer Islands it is the leading food. The supply of cassava is generally sufficient for domestic demand, and production in 1966 was estimated to be slightly higher than in 1965.



Figure 6.--Transplanting seedlings using marking sticks to guide them along straight rows.

The wide variety of vegetables produced in Indonesia also includes various kinds of cabbage, green beans, peas, bean sprouts, squash, onions, potatoes, yams, and various other roots.

Fruit, an important part of the peasant diet, is mainly grown in compound gardens, interplanted with vegetables and other crops. Fruit is usually consumed by the grower and only occasionally is marketed. The most common kinds are bananas, pineapples, durian, langsat, jackfruit, breadfruit, soursop, papayas, mangosteen, mangoes, and citrus.

Export Crops

Indonesia's major agricultural exports are rubber, copra, palm oil, coffee, tea, tobacco, and spices (mainly pepper) (table 3). The smallholder's contribution to agricultural exports has been increasing steadily; during 1961-62 it was 60 percent of recorded agricultural exports, compared with 37 percent in 1938-39.

Table 3.--Exports of major agricultural products, average 1955-59 and annual 1960-64 1/

Product	1955-59	1960	1961	1962	1963	1964
	1,000 metric tons					
Rubber (natural)	2/ 689	586	677	660	561	627
Copra <u>3/</u>	184	153	179	113.	89	130
Palm oil	121	108	118	100	110	133
Coffee <u>4/</u>	64	41	66	57	59	59
Tea <u>4/</u>	36.1	39	36	33	28	25
Tobacco	15	23	17	13	13	16
Pepper <u>5/</u>	24	15	26	18	44	--

1/ West Irian is excluded.

2/ Data for 1958 are incomplete.

3/ Oil equivalent; includes coconut oil as well as copra and estimates for unrecorded exports of both.

4/ No allowance for unrecorded exports.

5/ Includes unregistered exports to Singapore.

Source: (11).

Cassava is a dry-land crop, which is planted during the rainy season and harvested 6-18 months later. Cassava may be attacked by various pests, among which the cassava mite is the most damaging. Root rot is widespread and there is no known cure for it. Quantities of cassava are also lost to the foraging of rats, mice, and wild pigs.

Corn production has risen in the past decade, with reported production during 1960-64 averaging about 38 percent above the 1955-59 level. The 1965 harvest established a new record, 25 percent above the earlier high of 1964. As with rice, the Government has encouraged production by assisting growers with improved seed and fertilizers. Consumption of corn has also increased, but only an insignificant amount of corn is exported. Three-fourths of the total output of corn is grown on Java and Madura; southern Sulawesi, Bali, Lombok, and other Lesser Sundas are also producers.

Methods of cultivating corn have changed little since it was first introduced in Indonesia some 400 years ago. Both early and late varieties are grown. Corn is subject to damage by various insects and by plant diseases, of which downy mildew is the most serious.

Sweetpotatoes have been increasing in importance during the past decade. The yearly averages for area planted and production during 1962-64 were nearly double the 1951-55 average. Production was estimated to be about 4,300 metric tons in 1965 and slightly higher in 1966. Nearly half the country's sweetpotatoes are grown and consumed in the Outer Islands; on Java and Madura, they supplement the diet when rice is in short supply. Sweetpotatoes are usually grown in rotation with rice, and take about 4 months to mature. Most of the damage to the sweetpotato crop is done by insects and wild pigs. There is no foreign trade in sweetpotatoes.

The most important dry legumes grown in Indonesia are soybeans and peanuts, which together account for over half of all dry legumes produced. Cowpeas are next in importance; peas, lentils, and tropical beans are also produced. Production of soybeans and peanuts has been increasing. Both are mainly consumed locally and without processing. Soybeans and peanuts, which are high in both fat and protein, as well as the other legumes which are high in protein, are essential to the Indonesian diet.

Java and Madura produce nearly 90 percent of the soybean crop. Soybeans are generally planted after the wet-rice crop, and mature during the following dry season; they can be intercropped with other legumes or corn, or with peanuts where rain or irrigation water is sufficient. Soybeans can also be grown with cassava on unirrigated land. Soybeans are generally consumed in a form of bean cake, soybean cheese, or soybean sauce.

More than 80 percent of the peanuts are produced on Java and Madura. Although several varieties are grown, the most common are the China type, which matures in 6 to 7 months, and the Holle (similar to American varieties), which matures in 3 to 4 months. Peanuts can be grown on unirrigated land, but 40 percent of the crop is planted in rotation with wet rice.

Rubber heads the list of export crops and is the only major agricultural export crop for which the present production is above that prevailing before World War II, even though there has been a general downward trend in production over the last decade. This downward trend is due to inadequate replanting of ageing trees and other factors which have lowered production incentives, such as low world prices and the Indonesian Government's unfavorable exchange rate policy. Despite these factors, output was relatively high in 1966. The estimated 660,000 tons was a scant 2 percent below the unexpectedly large production of 1965 and well above 1963 and 1964.

During 1955-59, rubber's share of the value of recorded exports was about 39 percent, and during 1960-62, almost 43 percent; this probably reflects a drop in volume of other exports.

Rubber exports in 1965 were estimated to be 706,000 metric tons, a 12-percent increase over 1964, and the largest since 1955 although the value was less, due to lower prices. The gain was entirely in the smallholders' sector. Estate production declined 4 to 5 percent and is expected to decline further in 1966. The United States was the largest buyer, taking 43 percent of all rubber exports, which were valued at \$78 million. Japan and Mainland China were the next most important buyers.

Although a third or more of recorded exports have generally gone to Singapore for re-export or for processing and export, trade with Singapore was interrupted for about 3 years from 1963-66 as a result of the "confrontation" with Malaysia (an undeclared war launched by President Sukarno).

In complying with the International Rubber Agreement in 1934, the Colonial Government of Indonesia restricted production, and allotted production quotas that favored the estates. Thus, estate production predominated through the 1930's. Although during this period the smallholders were not permitted to harvest their full potential, they apparently had more hectares in rubber than did the estates, and when restrictions on tapping were lifted a few years later, smallholder production increased rapidly. By 1940, almost half of the rubber exports by weight came from the smallholder (but due to crude processing methods the quality of the rubber was generally inferior to that of the estates, making the percentage by value somewhat lower). A decade later the smallholder was contributing about three-fourths of the total output by weight. In 1965, about two-thirds of the value of all rubber produced came from the smallholder.

About 75 percent of smallholder rubber production comes from Sumatra, 24 percent from Kalimantan, and the rest from Java. On Java, where most of the small farms are in subsistence crops, rubber is grown mainly by the estates. Of total estate production, 40 percent is located on Java and the remaining 60 percent on Sumatra.

In the past, the estates maintained a steady output and replaced trees regularly to assure continuing productivity. However, the last of the rubber estates were nationalized early in 1965, and estate production has fallen off--a result of problems of management, labor, theft, squatters, and the lack of investment capital. Although the Indonesian Department of Estates recently decreed that all estates must have a replanting rate of 4 percent, it is very doubtful that this has actually taken place.

There has always been fluctuation in smallholder rubber output, depending not only on rubber prices but on comparative prices of other crops as well--especially dry rice and other food crops--since the smallholder usually concentrates on the crop offering the greatest profit. Only when rubber prices are high does smallholder production near capacity as, for example, during the Korean war.

The increases in smallholder output have been accomplished at the expense of capital invested. Trees have been overtapped, and there has been little replanting, partly because improved planting stock is scarce. It is estimated that 20 percent of smallholder rubber plantings are of little value. Less than 1 percent of the total hectares in rubber (estimated to be 1.8 million hectares) have been replanted during 1963 and 1964. This is insufficient to maintain output since rubber trees begin to decrease in productivity after 25 years, and produce very little after 40 years.

Extensive replanting with improved stock and acceptance of more efficient practices will be necessary for Indonesia to compete in the world market. Indonesian rubber must compete not only with that of countries using more modern techniques and better stock, but also with synthetic rubber.

The coconut palm and the oil palm provide oil for domestic consumption as well as copra, palm kernels, and oil for export. During 1957-61, Indonesia was seventh among the world's vegetable oil producers. During the same period, copra accounted for nearly 4 percent of the value of recorded exports and palm oil for 2.5 percent.

The coconut palm is grown throughout Indonesia, mainly by small farmers. On Java and Madura, coconut palms are mainly grown in smallholder compounds for home consumption; but in the Outer Islands, they are grown on plantations.

Copra is produced by drying coconut meat in the half shell, either in the sun or in a smokehouse that burns coconut shells. Smoke-dried copra is often of inferior quality. Copra is either crushed in village presses or sold to large mills for crushing. Java has to depend on the Outer Islands for part of its oil supplies. Exports of coconut oil have been prohibited in recent years, but small quantities have been smuggled out. However, Indonesia exports substantial quantities of copra cake and meal.

In April 1961, the Government declared copra an essential commodity, putting marketing, distribution, and pricing under Government supervision through the Association of Indonesian Copra Cooperatives. The Association handles the interisland shipment and export of copra and fixes the domestic price of copra throughout Indonesia. As a result of low prices set by the Association, there is considerable smuggling of copra.

Legal exports of copra in recent years have gone to the Sino-Soviet bloc as well as to Western European countries. Singapore and Penang, however, were the major markets until the interruption of trade with Malaysia. The confrontation with Malaysia also curtailed the activities of the many small ships from Singapore which had provided a means of shipping for many of the small Indonesian ports. In addition, there have been considerable difficulties with internal transportation and marketing.

There has been little apparent increase in copra production since 1950, and exports have shown a general decline. In 1965 they amounted to approximately 89,000 metric tons, but were expected to be higher in 1966.

Coconut palm groves, like the rubber groves, are in need of widespread replanting since most groves have been standing for 60 to 80 years. In addition, many palms have been damaged by pests or have suffered from lack of care.

Coconut palms are the source of many products besides copra, such as fresh coconut milk and meat and coir fiber used for brooms and brushes. The trunks of the palm trees serve for poles, the leaves for thatch, and the shells for cups and for fuel. The sap of the coconut palm can be made into an alcoholic drink or into brown sugar. The Indonesians say that the coconut palm has as many uses as there are days in the year, and the tree has been the source of many legends and religious rites.

Oil palms, in contrast to coconut palms, are grown almost exclusively on estates, which before nationalization in 1957 numbered 49. Most of the oil palm estates are on the east coast of Sumatra but there are also some on Sumatra's west coast, in Java south of Djakarta, and in Kalimantan.

The Indonesian oil palm industry is devoted mainly to the production of palm oil, which is extracted from the fruit pulp, rather than to palm kernels. Both palm oil and palm kernels are produced mainly for export. Palm oil production reached a record of 244,000 metric tons in 1939, but suffered heavily during World War II, and during 1950-54 averaged only 159,000 tons a year, and during 1960-64, 144,000 tons. Although world demand remained strong and prices trended up, exports of palm oil fell from 130,000 tons in 1964 to 110,000 in 1965 (even below the 1955-59 average).

Sugar no longer occupies the place in Indonesia's economy that it did during the first three decades of this century. In 1928, the sugar industry accounted for over half of the value of all agricultural exports. During the 1930's the industry was adversely affected by restrictions under international sugar agreements and by the worldwide economic depression; it suffered further from the Japanese occupation during World War II, and later, during the Indonesians' fight for independence from the Dutch. By the time independence was achieved in 1949, production had fallen off by half. After the estate seizures in 1957-58, sugar yields per hectare declined owing to poor maintenance and shortage of trained personnel. However, the industry has made some recovery. Average annual production of cane sugar for 1960-64 was about 40 percent above the 1950-54 level. But partially because of low sugar prices, domestic sugar consumption has increased over the past decade, making it necessary to curtail and at times prohibit exports. Recent output of centrifugal sugar has been between 500,000 and 600,000 metric tons a year, little more than was needed for domestic use.

Sugarcane is grown mainly on Java and Madura, and to a small extent on Sumatra. Before World War II, centrifugal sugar production, being dependent on processing facilities, was confined to the estates--each with its mill; but since mid-1950, small farmers have grown one-fourth of the cane for centrifugal sugar as well as all the cane for noncentrifugal or crude brown sugar.

Sugarcane needs an environment very similar to that needed by wet rice and has generally been grown on sawah in rotation with rice. Under the Colonial Government, estates leased land from the small farmers to grow cane, and since the cane crop was rotated with rice or other food crops every 18 to 36 months, the farmers grew food crops between cane crops and were paid by the estates to work the cane crops. Since 1958, the same type of system has been in effect under the Government Estates Administration of the Indonesian Government.

The Indonesian Government wants to increase sugar production not only for domestic consumption but also for export. To keep sugar prices low--to offset inflation and to enable sugar to compete on the world market--sugar prices offered by the Government-controlled mills are low, and the small grower has become increasingly reluctant to devote land to growing sugar for the mills when other food crops offer greater profit. In 1962, sales of farm-grown cane to the mills fell to little more than one-fifth of the 1955-59 average, and centrifugal sugar output dropped to a 10-year low. A good deal of the sugar grown by the small farmer is sold to the producers of crude brown sugar, rather than to the large mills, since these small producers pay better.

The Government hopes to raise sugar production and rehabilitate many of the mills. In July 1965, a provisional production-sharing contract was signed with 3 Japanese firms for rehabilitation of 32 sugar mills. This could provide an important stimulus to sugar production.

Tobacco, prior to World War II, was an important export crop; during 1935-39, some 46,000 metric tons were exported annually, providing Indonesia with an important source of foreign exchange. During the 1950's, average annual production fell off by almost two-thirds, and exports by a little more. By 1952, tobacco exports represented less than 4 percent of the value of all agricultural exports.

Tobacco is an annual with a short growing season; it thrives on unirrigated land or on sawah during the dry monsoon. During 1935-39, the estates accounted for two-fifths of the tobacco produced and for a still larger proportion of the tobacco exported; during 1955-59, following nationalization, their share in output and exports dropped to less than one-tenth of the total. Since then, estates have been hampered particularly by squatters and by the steady deterioration of transportation facilities.

Estate tobacco production has always been centered in central and eastern Java and on the east coast of Sumatra where Indonesia's most famous tobacco, Deli cigar wrapper, is produced. Soil and climate in this area make Deli one of the best tobaccos in the world. Only one crop is harvested each year on the estates, which average 3,500 hectares in size, and tobacco is planted only once in about 8 years on the same plot.

Cultivation by the small farmer is centered on Java and Madura, especially in central and eastern Java. Much of this crop does not enter commercial channels, and Krossok, the leading variety planted by the small grower, is often cured and made into various types of clove flavored cigarettes for domestic use.

During the past decade a growing demand for Virginia-type cigarettes has stimulated the production of flue-cured tobacco, which is grown from seed imported from the United States. During the 1950's, and especially in 1956, significant quantities of flue-cured tobacco were imported from the United States under P.L. 480. These imports were sharply curtailed during 1959-63, owing to a shortage of foreign exchange.

Before World War II, Indonesia ranked third, after India and Ceylon, as an exporter of tea; more recently it has ranked fourth, after Mainland China as well. Volume of tea exports dropped by more than 50 percent following the World War II and has not recovered significantly since. In 1962, tea contributed less than 5 percent of the total value of exports.

Until about 1910, tea was almost exclusively grown on estates; since then, smallholder output, although inferior in quality to that processed on the estates, has increased. Estate production, having fallen during the war, represented only about half of total production during 1959-62.

Tea is a subtropical crop, which thrives in a mild climate without long droughts. Tea cultivation is suited to western Java and Sumatra. Growers prune the tea plants to maintain a low, spreading bush, which provides better shoots and more young leaves. Yields are obtained 3 to 4 years after planting. A tea bush averages about 50 years of productive life.

In contrast to tea, coffee recovered rapidly from the low production level reached in the 1940's. In 1963, production exceeded the 1934-38 average by more than 10 percent, although it declined in 1964. In recent years, about four-fifths of the coffee output has been grown by smallholders and the rest mainly by estates on Java. About three-fourths of Indonesian coffee production is exported but about 25 percent of that exported does not appear in official registration of shipments.

"Java" coffee, though famed throughout the world, is no longer the predominant type grown in Indonesia. Wide areas of Java coffee (Coffea arabica) succumbed to disease, and growers shifted to the more disease-resistant, but less mild Coffea robusta, which now accounts for about 90 percent of total output. Robusta requires a well-drained soil and thrives best at altitudes of 300 to 800 meters. Coffee is often interplanted with other crops, for example, rubber. Trees begin to bear about 3 years after planting and reach maximum yield after 5 years; the crop is harvested from June to September.

Cultivation of fiber-producing plants is of minor importance in the Indonesian economy. The most important fibrous plants grown are hard fibers and kapok. Only small quantities of cotton are grown, and Indonesia must import the bulk of its needs.

Hard fibers produced include sisal, cantala, abaca or manila hemp, and coir (from the coconut palm). With the exception of coir, for which no output data are available, production of hard fibers has declined sharply in recent years, from some 40,000 metric tons in 1940 to only 3,000 tons in 1964. All of the crop is estate-grown, and most of it is exported.

More than 90 percent of the kapok crop is grown by small farmers. Total production in 1961, 22,000 metric tons, was still as large as the average crop had been during 1936-40. During 1958-62, exports amounted to about one-eighth of production.

Pepper, the most important spice, is mainly grown by small farmers. Indonesia is the world's leading pepper exporter. During 1957-62, output averaged approximately 16,000 metric tons annually. Pepper is grown mainly on southern Sumatra and southern Kalimantan (black pepper), and on the islands of Bangka and Billiton (white pepper).

Production of other spices, mainly cinnamon, clove, nutmeg, and mace, averaged about 30,000 metric tons annually during 1957-62. Domestic demand for clove, which is used in cigarettes, exceeds production and average annual imports during 1959-63 almost equalled output. Cinnamon, nutmeg, and mace are all exported as well as consumed domestically.

Before World War II, Indonesia accounted for 90 percent of the world's supply of cinchona bark, from which quinine is extracted. Following World War II, competition from synthetic substitutes for quinine reduced the demand, and cultivation decreased sharply. During 1957-62, the output of cinchona bark averaged less than 4,000 metric tons a year, compared with some 11,000 tons in 1935-39. Cultivation of cinchona is almost entirely confined to estates, mainly in western Java.

Livestock and Livestock Products

Although data on Indonesia's livestock production are not generally reliable, estimates can be used to give a broad view of the relative importance of the kinds of livestock and their regional distribution. Livestock raising is not important as an industry, except in Bali and the other eastern islands, which export live cattle to Singapore and Hong Kong. There is almost no milk production. Imports are insignificant; exports of live cattle amount to about 200,000 head a year.

Most of the cattle, goats, and sheep are located on Java and Madura, but livestock raising is limited by scarcity of feed, animal disease, and poor care. Although cattle and water buffaloes are raised principally for draft animals, they furnish the major part of the small quantity of meat consumed. During 1956-60, cattle and buffaloes together were estimated to number about 7.8 million, although cattle far outnumber the buffaloes.

According to 1961 estimates, about half of the meager horse population is located in the Lesser Sunda Islands, where there is sufficient grazing. In Indonesia, horses are seldom used for agriculture, and are declining in importance for transportation.

The average number of hogs in Indonesia during 1956-60 was estimated to be 1.7 million. Hog raising is important in non-Muslim areas such as Bali, Lombok, and northern Sumatra; in Java and Madura, where most of the people are Muslims, there are few hogs. The Chinese in Indonesia have long been important hog raisers. The native hog is small and generally finds its feed by roaming. It has little fat and its meat is coarse.

Most of the goats (estimated in 1963 to be 5 times more numerous than sheep) as well as the sheep are located on Java and Madura. Sheep are raised primarily for meat; raising sheep for wool has not been successful.

The latest available estimate of poultry numbers is 97 million for 1951-52. Most poultry are kept by villagers; they are not fed, but instead are allowed to scavenge. Egg production is estimated at between 200,000 and 250,000 metric tons annually; trade in eggs or egg products is insignificant.

Foreign Trade in Agricultural Products

Exports of agricultural products, although showing a decline over the past decade, averaged almost 60 percent of the total value of recorded exports in 1961-62. Rubber accounted for about 72 percent of agricultural exports, having risen from 38 percent in 1939.

Indonesian agricultural exports generally have gone mainly to Western Europe, Malaysia and Singapore, and the United States (table 4). In 1961, the United States ranked first, taking more than 28 percent by value; in 1962, owing to a decrease in rubber purchases, the U.S. share dropped to 9.5 percent. During 1963-65, the value of Indonesia's exports to the United States did not change appreciably, but in 1966, this was expected to be somewhat higher.

A high percentage of imports are dependent on foreign assistance and credits. Rice is by far the leading agricultural import, followed by wheat flour, dairy products, cloves, and cotton. As major sources of rice, Thailand and Burma usually have ranked first among Indonesia's suppliers of agricultural products (table 5). During most of the past decade, P.L. 480 shipments, especially of rice and cotton but also of dried skim milk, wheat flour, and tobacco, have made the United States also a leading supplier.

Indonesia's agricultural imports from the United States shrank from \$44.1 million in 1963 to \$15.7 million in 1964. In 1965, with President Sukarno's rejection of U.S. aid, Indonesia's reduced ability to pay, and unwillingness of U.S. Government agencies and private firms to extend credit under these conditions, Indonesia's imports from the United States fell to an all time low, \$1.6 million--almost all for relief or charity.

It is estimated that total trade for 1965 was considerably lower than that for 1964, and was comparable to 1963 when trade was disrupted with Malaysia. Indonesian trade with Mainland China was also disrupted following the attempted Communist coup of September 30, 1965. As export earnings have steadily declined, Indonesia has needed longer and longer credit terms for her commercial imports. In addition, land and sea transportation have become crippled by harbor congestion and deterioration of equipment, and anti-Chinese sentiment and the threat to repatriate the Chinese living in Indonesia have caused a scarcity of Chinese capital previously used for financing trade.

Indonesia's foreign trade activities have been largely concentrated in Government trading corporations or monopolies. In 1964, state trading companies reportedly handled at least 60 percent of Indonesian imports and about 25 percent of exports. In addition, the Government food agency handled

Table 4.--Agricultural exports, by commodity and area of destination, 1961 1/

Commodity	Million dollars										Percent
	United States	Western Europe	U.S.S.R.	Other Eastern Europe	Malaya and Singapore	Mainland China	Japan	Other	Total	Percentage of total, by commodity	
Rubber	109.5	33.8	27.6	11.0	83.2	34.8	5.6	0.8	306.1	64.6	
Coffee	4.4	5.9	0.5	0	3.0	0	0	0	13.8	2.9	
Tea	2.9	15.9	0	0	1.3	0	0	5.5	25.7	5.4	
Oilseeds and vegetable oils	12.3	20.6	2.4	0.1	19.3	1.5	6.1	3.2	65.6	13.9	
Tobacco	0.1	24.1	0	0	0.5	0	0	0	24.6	5.2	
Pepper	1.3	5.3	0	0	8.3	0	0	0	15.0	3.2	
Fibers	0.8	1.2	0.4	0	0	0.1	0.5	0.8	3.8	0.8	
Tapioca	0	2.3	0	0	0	0	0	0.2	2.5	0.5	
Other	2.3	4.8	0.7	0.1	5.9	0	1.4	1.2	16.5	3.5	
Total	133.6	113.9	31.5	11.2	121.5	36.4	13.7	11.7	473.5	100.0	
Percentage of total, by country or region	28.2	24.1	6.6	2.4	25.6	7.7	2.9	2.5	100.0	--	

1/ Excludes West Irian. No allowance has been made for unrecorded exports. Totals may not add due to rounding.

Source: (6).

Table 5.--Value of agricultural imports, by commodity and area of origin, 1961 ^{1/}

Commodity	Thailand:	Burma	United States:	Western:		Other:	Total:	Percentage of total, by commodity
				Europe:	Million dollars			
Rice	26.5	26.1	8.8	5.03	4.7	71.2	60.5	
Wheat flour	0	0	1.2	0.9	2/8.0	10.1	8.6	
Cotton	0	0	7.7	0	0.1	7.7	6.6	
Dairy products	0	0	0.8	5.8	0.9	7.5	6.4	
Cloves	0	0	0	0	3/6.2	6.2	5.3	
Tobacco	0	0	2.2	0	0	2.2	1.9	
Other	0	0	1.0	2.6	9.1	12.6	10.7	
Total	26.5	26.1	21.7	14.3	29.0	117.7	100.0	
Percentage of total, by country or region	22.5	22.2	18.5	2.2	24.6	100.0	--	

^{1/} Excludes West Irian. No allowance has been made for unrecorded imports. Totals may not add due to rounding. ^{2/} Includes Australia (\$7.5 million) and Canada (\$0.5 million). ^{3/} Includes British East Africa (\$4.4 million), Malagasy Republic (\$1.5 million), and Somalia (\$0.4 million).

Source: (6).

rice imports. Although import regulations have been used to promote and protect domestic industries and export regulations to avoid commodity shortages at home, both have been applied mainly in an effort to cope with balance of payments deficits.

Toward the end of 1965, a change was announced in trading rates and regulations to eliminate time wasting procedures which discourage trade, to establish a more realistic exchange between domestic and foreign currencies, and to encourage both exports and imports considered most vital to the economy. Imports with top priority include foodstuffs (primarily rice), raw materials for domestic industries (such as cotton), raw materials that will stimulate exports (such as chemicals for treatment of rubber), and spare parts for machinery and equipment. Although the new regulations have proved unsatisfactory in many respects, they have improved the exporters' position somewhat.

In 1966, Indonesia's new leaders announced the end of the Malaysian confrontation, making possible resumption of trade with Singapore, and are encouraging trade with other countries. The United States has agreed to resume P.L. 480 shipments of cotton and rice. Considerable imports of rice, wheat flour, and dry milk will be needed in the future. In addition, a continuing supply of raw cotton, yarn and cloth will be needed if the vital textile industry is to contribute to the improvement of the economy.

AGRICULTURAL POLICIES, ORGANIZATIONS, AND INSTITUTIONS

Agricultural Policy

The agricultural sections of Indonesia's Eight-Year (1961-68) Development Plan are intended to promote self-sufficiency in food and fibers, except in dairy products and cotton. They also plan for increases in the quantity and quality of agricultural exports.

Except for the creation of the paddy centers, progress under the plan has been extremely limited. No attempt has been made to stimulate output through farm-price support or direct production subsidies; on the contrary, the Government has tried to check undue price increases by price control measures.

The most promising attack on one of the basic ills of Indonesia's foundering economy--low rice yields on good land--is proving its worth and gaining momentum in the lush farming areas of Java and some of the Outer Islands. Sparked by the dedication and drive of 1,150 specially trained agricultural students assigned to supervise improved planting and cultural practices on selected irrigated fields, a new agricultural project called "Bimas," meaning "simultaneous mass guidance," was credited with almost doubling the output of paddy on 220,000 hectares in the 1965-66 crop year. The students had the authority to take individual problems directly to top village officials and were assisted by 3,000 extension agents, 30,000 cooperative workers, and 40,000 outstanding farmers. Each had received at least 80 hours of classroom instruction. In addition to supervision in the fields, the students also had responsibility for distribution of fertilizer, new strains of seeds, and pesticides purchased with interest-free government credits. The project was very successful, and is to be expanded.

Farm Organizations

Following Indonesian independence, unions of estate workers played an important role in economic, governmental, and political activity. The main union of estate workers was the Union of Plantation Workers, the largest union in the country. This union, along with the union of sugar workers, was affiliated with the Communist Party. The Indonesian Communist Party, through the Indonesian Peasants' Association, also encouraged and supported landless peasants, especially in demanding faster implementation of land-reform legislation. By the end of 1965, the Communists' labor federation and its affiliated unions had disappeared. The present Government of Indonesia is reticent concerning the concept of free trade unionism, but seems to prefer a sort of "national socialism."

The cooperative movement, initiated in colonial times, did not spread in rural areas until the 1950's, especially 1958, when the Government encouraged agricultural cooperatives to replace the functions of local Chinese merchants and moneylenders, who were being forced out. By 1962, rural cooperatives had reached a total of nearly 35,000, and their membership reportedly totaled 6.5 million.

Farm Credit

There is a chronic shortage of credit in Indonesia. Facilities for institutional credit are inadequate, and the small farmer is often dependent on moneylenders, landlords, and others who charge very high rates. Since loans carrying such high interest can rarely be paid, the small farmer sinks deeper into debt each season and not only cannot afford to improve his farm but often must transfer its control to the lender, thus becoming in reality a sharecropper. No estimates are available of total farm indebtedness, and data are incomplete even for loans advanced through institutional facilities. Both farmers and private creditors, for various reasons, are reluctant to volunteer information.

Institutions that offer cheap credit to farmers are (1) the Bank for Cooperatives, Farmers, and Fisherman (almost 40 percent of the credit it advanced in 1962 was for rural areas); (2) Village Banks and Village Rice Banks (both Government supervised); (3) credit cooperatives; and (4) Government owned or licensed pawnshops, which are important in rural as well as urban areas. Until recently, estates apparently were financed by commercial banks.

Foreign Aid

Between 1949 and 1964, the United States provided more than \$700 million of aid to Indonesia in the form of loans, grants, and concessional sales of agricultural products--mostly rice, cotton, wheat flour, dry milk, and tobacco. As direct aid to agriculture, the United States has provided funds and technical aid for a variety of projects aimed at improving and expanding agricultural education, research facilities, and extension work, including pilot demonstrations of methods to reconstruct and renovate irrigation and flood-control installations and to raise corn yields in Java.

Practically all U.S. aid as well as aid from other countries was rejected by President Sukarno during the second half of 1964 and early 1965. As President Sukarno turned his back on the West, Indonesia resigned from the United Nations and from the U.N. special agencies; among these was the Food and Agriculture Organization, which had a program of technical assistance in Indonesia. Indonesia also withdrew from the International Monetary Fund and the International Bank for Reconstruction and Development (World Bank).

Under its new leaders, Indonesia began rejoining these organizations in 1966, and indicated a desire to resume U.S. aid. Renewed offers of aid have come from many countries, including the United States, the Netherlands, Great Britain, Japan, West Germany, India, and Pakistan. Creditor nations met in Tokyo in September 1966 to plan the rescheduling of Indonesia's enormous debts and long-term aid program.

Under the P.L. 480 agricultural surplus program, the United States agreed to supply, in 1966, 225,000 bales of cotton (of which 75,000 bales were for third-country processing) and 100,000 metric tons of rice. Proceeds from the sale of these commodities will be used for loans for economic and social development programs.

PROSPECTS

The spiraling cost of living has been the main threat to Indonesia's economy, particularly to agriculture, the economic sector hardest hit by the inflation. An index of retail prices in Djakarta, Indonesia's capital, soared from a base of 100 in August 1955 to 18,600 a decade later. Under the previous Government, the country's money supply doubled every year from 1961 to 1964, and tripled in 1965. The new Government hopes to increase its income by intensified tax collection and increased exports. In December 1965, it announced that it was issuing new money as legal tender--1 new rupiah to equal 1,000 old.

Sustained agricultural development will require new techniques and increased use of fertilizer, pesticides, and selected seeds, as well as flood-control and irrigation projects. Smallholder agriculture in particular needs Government assistance, such as effective extension service and experiment stations, better trained technicians to help the farmers, cooperative storage and marketing arrangements, and improved credit availability. Agriculture in the Outer Islands should be expanded and diversified, and management of the estates improved.

The Indonesian Government is well aware of the urgent need to raise agricultural production, not only for domestic consumption but also for its contribution to the economy and as a source of foreign exchange. The Deputy Prime Minister for Economics, Finance, and Development, Hamengku Buwono, the Sultan of Jogjakarta, has stated that exports must be expanded and foreign exchange brought under control, that priority must be given to agriculture, transportation facilities, and shipping services, and that there must be improvement in land reform.

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