04.047 Cane sugar in the Province is produced predominantly by two state-owned estates, PNP XV and PNP XVI. The former, with headquarters in Solo and five plantation units in the above-mentioned southeastern zone had the total planted area of 11,417 hectares in 1974. PTP XVI, which has its headquarters in Semarang, has five plantation units in the northern coastal zone, and the total planted area is 10,190 hectares. There are two private estates of about 1,000 hectares each.

04.048 The estates do not own their land, but rent it from large number of small farmers under the traditional system inherited from the colonial regime. This rental system, however, is being altered starting from 1976 in accordance with the Central Government's decision to the effect that all sugar plantation land should be turned over to individual farmers for their own cultivation by the end of Repelita II. This change is now being made with the assistance of the Government.

(e) Other Non-food Crops

04.049 Kapoc is planted widely by small-holders. PNP XIII and some private estates also plant it but not on large area. It was one of the main export items of Indonesia but its exports have declined, as kapoc has been replaced to a good extent by synthetic materials.

04.050 Besides kapoc fiber, kapoc seed is valuable source of edible oil. As there is no oil mill for processing kapoc seed in the Province, seeds are sold to mills in Surabaya.

04.051 Tea is produced both by estates and small-holders; estates usually produce black tea for export and small-holders produce green (unfermented) tea for domestic consumption. Highland areas in the kabupatens of Pemalang, Banyumas, Banjarnegara, Brebes and Magelang are the main tea plantation areas of the Province.

04.052 Cloves, for which Indonesia is the largest producer, importer and consumer, is produced in the Province, and in other provinces. Its production has been rapidly increased through the aid of Government subsidies and provision of credit. The most important use of the spice is for making kretek cigarettes. The manufacturing of kretec cigarettes is highly concentrated in Kudus (see Chapter VI) and large amount of cloves is imported there both from other provinces and abroad (Tanzania and Madagascar).

04.053 Cultivation of cloves is of very labor-intensive, especially for harvesting, i.e., picking the flower buds, and therefore has high employment effects.

04.054 Cotton production in the Province, though still small in quantity, has increased very rapidly since 1974 with strong Government supoort. As cotton is a very labor-intensive crop, Central Java is in a good position to increase its production, if it is suited agronomically to this Province. Cotton-seed as a by-product is also a valuable source of edible oil.

4.1.5 Livestock

04.055 Livestock raising is mainly a small-holder operation in Central Java, and cattle is by far the most important farm animal. The animal population in the Province is as follows:

	(Unit: Head)
Horse	49,167
Cattle	940,495
Buffalo	407,516
Goats	2,126,339
Sheep	877,660
Pig	156,820
Chicken	16,971,958
Duck	2,494,801
Milk Cow	14,922
Enterprises' Milk Cow	4,462
People's Milk Cow	10,460
Milk Sheep	2,174
Foreign Varieties of Chicken	206,170

Source: Laporan Tahunan 1975, Dinas Peternakan.

04.056 Cattle and buffalo are kept mainly for as draft animals, and as sources of meat as a by-product. Cows are used for ploughing while most bulls are sold when they reach maturity or when farmers need cash; also, some bulls are used for farm and road transport. Cows are started at light work when they reach two years of age and are normally sold for slaughter at over 10 years of age. The breed of cattle in Central Java is mostly Ongole cattle, (Bos Indicus), which were introduced from India.

04.057 There are about 15,000 head (including 3,000 males) of dairy cattle in Central Java, of which 4,000 are high-grade Freision stock based on original importation from the Northernland. Of the 15,000 head, about 4,500 are kept by commercial dairies in and around cities, especially Semarang and Surakarta. There are 11 such enterprises in each of the two

cities. These urban dairies purchase their feed from outside the urban area. A cow yields about 2,500 liters of milk per year, of which calves drink about 350 liters.

04.058 While the urban dairy has a long history dating from colonial days, production of milk by farmers in rural areas is a post-war development. It developed in the kabupatens of Salatiga and Boyolali along the highway between Semarang and Surakarta, the products in these two kabupatens are supplied to the two cities. In the kabupatens of Klaten and Karanganyar, rural dairies provide milk solely to Surakarta. More recently, rural dairies developed along highways between Cilacap and Banyumas. The dairy farmers in Salatiga and Boyolali are organized into cooperatives in each kabupaten.

04.059 The consumption of fresh milk in the Province is still very low. Perhaps more reconstituted milk is consumed than fresh milk, even though the price of the former is higher. The reconstituted milk is supplied by INDOMILK, an Australian joint venture in Jakarta.

04.060 Poultry production in Central Java can be divided into two categories; kampung (village) production, and commercial production. The estimated number of kampung birds in the Province is about 17 millions. The hen which matures at 9 months only produces about 40 eggs a year for the first year and after that laying decreases considerably. The average farmer usually has 5 to 10 birds, but they are not given any kind of feed. The birds subsist on what they can find by scratching the soil and eating insects.

04.061 Commercial poultry for egg production has been developing in the areas near cities. The owners of the commercial poultry enterprises are various; they may be farmers, retired government official or businessmen. The largest one, P.T. Marapen in Semarang, is a rubber processor. This company keeps some 12,000 hens. The second largest, P.T. Cemara in Tegal, is a company specialized in livestock and raises pigs and hens. Although the production of commercial eggs has increased, the supply of eggs to cities still come largely from kampongs. The estimated share in Semarang is 80 percent by Kampung eggs and 20 percent by commercial eggs.

04.062 Producers of chicken meat have not yet developed in the Province; there are only a few broiler farms are in the suburbs of Semarang, Surakarta and Pekalongan.

04.063 Sheep and goat are kept by farmers primarily for meat production. Most goats are kept in small flocks by peasant farmers. In the irrigated areas the goats are penned and fed with cut grass, crop by-products and leaves of such trees as palm, mango and natro (*Lucasia glauca*). In dry land (tegal) areas, they are herded during the day time. Sheep are not many in Central Java, in contrast to East Java where sheep are greater in number than goats.

04.064 Since the land in Central Java is extremely limited, the areas for natural grazing are only roadside strips, ditches, river banks etc. However, there are some grasslands in the few high plateaux. These "alpine pastures", perhaps the best natural pasture of the country, should be used for beef fattening or sheep raising programs and could be greatly improved by introducing exotic pasture and fodder species. The practice of growing fodder crops in rotation or inter-cropping with other crops is rarely practiced, but the member farmers of the above mentioned Boyolali Dairy Farmers Cooperative plant elephant grass between rows of maize with good results.

04.065 Animal diseases are a serious threat to the development of livestock industry in the Province, same as in other regions of Indonesia.

04.066 Foot-and-mouth disease is the most serious problem. Due to existence of this disease, many foreign countries prohibit the importation of cattle and beef from Indonesia. Newcastle disease is a serious threat to poultry. The virus strain present in Indonesia is particularly virulent and cause 40 to 50 percent mortality, often with after-effects which severely impair the productivity of the survivors.

4.1.6 Fishery

04.067 Marine fishing is undertaken along the northern coast facing the and around the Karimumjava islands off the northern coast and belonging to the Kabupaten Jepara. Fisheries on the southern coast are insignificant; only 6 percent of the fisherman of the Province operate on this side, but shrimp trawlers from other provinces (mainly of North Sumatra) unload their catch at Cilacap to supply it to the cold storage in the city; the product (frozen shrimp) is exported to Japan.

04.068 There are about 55 thousand fishermen in the Province. Their fishing activities are performed generally from sailing boats although the Government has been pushing "motorization" of fishing. It is noteworthy that the number of motorized boats has been increasing since 1973. However, motorization is highly concentrated in Pekalongan and Cilacap. Out of the 674 powered fishing vessels in the Province, 163 are in Pekalongan city, and there in Pekalongan the number of non-motorized boats and number of fishermen are the smallest. Along the eastern part of the northern coast, i.e., Jepara and Pati, fishing is performed mostly by use of non-motorized small boats. In Kabupaten Rembang there are only two motorized boats and the number of fishermen is as high as 12,556.

04.069 The abrupt increase of motored vessels in Pekalongan in 1973 is attributed in large part to the investment in fisheries by batik manufacturers in KDY Pekalongan. The depression of the batik industry in 1972 and 1973 forced them to divert their capital investment from the industry to fisherlies.

04.070 The number of fishermen, fishing boats and fish catch in recent years are as follows:

	1970	1971	1972	1973	1974	1975	1976
Fishermen (Persons)	52,444	55,285	51,556	55,040	56,307	63,654	65,320
Fishing Boats							
Non-powered (Boats)	9,885	9,829	10,771	13,038	12,105	12,521	12,413
Powered (Boats)	153	156	276	496	499	674	781
Marine Fish Catch (Metric tons)	28,400	28,979	33,274	36,651	44,763	49,273	51,678

Source: Dinas Perikanan, Provincial Government.

04.071 Fish culture in brackish water is widely carried out along the northern coastal areas and to some extent in southern coast areas. The main species of fish cultured is milk fish, but shrimp culture has been gaining importance in recent years. While the former is for domestic markets, the latter is for both domestic consumption and export. The area of brackish water ponds in the Province used for fish culture and the production in recent years are shown below.

Brackish Water Fish Culture	1970	1971	1972	1973	1974	1975
Area of Ponds (ha)	24,708	24,507	24,984	24,434	25,210	25,243
Production (Metric tons)	8,858	5,321	3,311	6,209	7,178	7,430

Source: Dinas Perikanan, Provincial Government of Central Java.

04.072 Inland fisheries, which consist of open water (rivers and lakes), fisheries and fish culture in fresh water ponds and paddy fields, are an important source of protein supply to inland people. The catches and production of inland fisheries are as follows.

Production of Inland Fishery (Metric tons)	1970	1971	1972	1973	1974	1975
Open Water Fishery	6,493	5,623	6,768	3,626	3,377	4,167
Fish Culture in Pond	1,469	1,644	1,825	1,418	1,649	2,164
Fish Culture in Paddy Field	123	232	207	281	150	212

Source: Dinas Perikanan, Provincial Government.

4.1.7 Forestry

04.073 The forest land in Central Java is about 650,000 hectares, accounting for about 20 percent of the total land area in the Province. The forest land of the Province has been designated as follows:

Protection Forests Without Production	19,300 ha
Protection Forests With Production	125,680 ha
Production Forests	502,025 ha
Nature Conservation	3,000 ha

Source: Directorate General of Forestry, Ministry of Agriculture, Jakarta

For silvicultural administration purposes, these forest lands are defined as follows:

(1) Protection forests are generally those forests located at elevations higher than 700 meters above sea level and on the slopes steeper than 30 percent. The function of these forests are protection of watershed, prevention of erosion and regulation of waterflow.

(2) Production forests are those forests which are utilized for perpetual production.

(3) Nature reserve forests including game reserve and parks are those areas which support unique flora or fauna which are suitable for recreational or academic pursuits.

Among various forest products in Central Java, teak is by far the most important. The systematic establishment and management of teak plantations dates back well over a century. The teak forest in the Province totals 347,396 hectares and produces yearly about 250,000 m^3 of log (yearly fluctuation is very small). In addition to the log, teak fire wood is also produced; the amount produced varies year by year and ranges from 100,000 to 200,000 m^3. There is a current tendency for production to decline. Teak plantations are generally at elevations lower than 500 m and are on calcarious soil. And, although teak is produced all over the Province, production is highly concentrated in two kabupatens, Blora and Purwodadi, near the eastern border of the Province: the production in these two kabupatens accounts for about 75 percent of the Provincial total.

04.074 Next to teak, coniferious trees are economically important. Pinus Merkusii and Agathis Bornensis are planted in the central highlands at 800 meters or more above sea level. Resin is tapped from conifers and logs are used to obtain sawn timber. The areas planted with pine and agathis are 167,974 hectares and 24,719 hectares respectively.

04.075 Although coniferous trees can be a good raw material for pulp and paper, they are not used for this purpose in the Province. Although there is one paper/pulp plant in the Province, the materials used there are rice straw mixed with long fiber from woods imported from Sumatra. There reportedly was a plan to establish a paper mill in Cilacap for processing coniferous pulp but the plan is now suspended or has been postponed. Coniferous wood may be used also as building materials and for other uses and there may be export possibilities. The development of coniferous log industry would not only bring about economic benefits but would also provide employment opportunities to mountain people who are now engaged only in subsistence farming and lack cash income. With a view to developing coniferous wood production in the Province, the Government is conducting surveys on coniferous forests with technical assistance from the Japanese Government.

04.076 In Central Java, as well as in East Java, the management of nationally-owned forest land is the responsibility of Perhutani (State Forest Enterprise). It manages all teak plantations and all agathis and other useful forests in the Province. Only a small portion of the woodland of the Province is privately owned and these lands are generally covered by lower value trees.

04.077 Most of Java's forest products are consumed domestically. Although Java is the world largest teak producer, the export of log constitute only a small portion (about 10 percent) of the production. This reflects the high demand and good prices of teak for local use.

4.2 Government Policies and Programs

4.2.1 Basic Agricultural Policy

04.078 Various agricultural programs are carried out in the Province under the national Repelitas. The Repelita I for the agricultural sector aims at (1) increasing food production, especially that of rice, (2) increasing production and diversification of export crops, and (3) enlarging employment opportunities. In addition, the equalization of income is also emphasized in the present Repelita II.

04.079 In the course of implementing these objectives during the Repelita I period, the highest priority was placed on increasing the production of rice in order to attain national self-sufficiency of rice, and very little was done to attain other objectives. It is only in recent years after the inception of Repelita II that programs for other subsectors began to operate.

4.2.2 Rice Intensification Programs: BIMAS/INMAS

04.080 The efforts for increasing rice production have been concentrated into two major programs, i.e., "intensification" and irrigation improvement. The program for intensification started as early as in the 1963/64 wet season under DEMAS by mobilizing students of Agriculture College of Bogor. The program or campaign was intended to persuade farmers to practice the "five efforts" which were (1) use of high-yielding varieties, (2) proper application of fertilizers, (3) prevention and eradication of insects, diseases and rodents, (4) proper management of irrigation and (5) other improvement of cultivation methods. The participating farmers were provided with loans from Bank Indonesia Unit II (later reorganized into BRI). The principles of the DEMAS was succeeded by BIMAS, which stands for Bimbingan Masal or Mass Guidance, from the wet season of 1965/66.

04.081 After several changes had been made as experiences were accumulated, the present BIMAS or the "Improved BIMAS" (BIMAS Yang Disemputnakan) was started in the 1970/71 wet season.

04.082 The present BIMAS (Improved BIMAS) program consists of production credit supplied to participating farmers by BRI (People's Bank, see Chapter V) for purchase of packaged inputs (high-yielding seeds, fertilizer, insecticide, etc.) and provision of technical guidance by extension services.

04.083 The standard package, which may be modified to meet local conditions, consists of 200 kg of urea, 45 kg of triple super phosphate (TSP) for one hectare of paddy field. The credit ranges Rp.10,000 to 25,000 with monthly interest rate of 1 percent, payable in seven months or one month after harvest. These materials are distributed through BUUD (see Chapter V).

04.084 In parallel with BIMAS or as its aftercare, INMAS (Intensifikasi Masal) is carried out. The underlying philosophy of the INMAS is as follows: farmers who have been assisted under the BIMAS would have increased production and income, hence they would no longer need credit and would be provided only with technical advice. The INMAS farmers, therefore, are expected to purchase improved seeds and fertilizers without credit though still at the subsidized prices. The areas covered by BIMAS and INMAS for rice (BIMAS/INMAS Padi) in the last two seasons in Central Java are as follows:

1975	Dry Season	BIMAS	166,743 ha
		INMAS	89,246 "
		Total	255,999 "
1975/76	Wet Season	BIMAS	475,336 ha
		INMAS	206,276 "
		Total	681,612

Source: PEMANTAPAN PELAKSANAAN BIMAS/INMAS, Dinas Pertanian Rakyat

4.2.3 Irrigation Programs

04.085 In order to increase rice production, the Government gives very high priority to irrigation programs which include rehabilitation, expansion and maintenance of irrigation facilities.

04.086 The irrigation facilities are of three types; so-called technical and semi-technical systems constructed by irrigation authorities, and "people's irrigation" or "village irrigation" or "simple irrigation". Technical irrigation is supplied from a weir with full water management and control facilities built into the system down to, but not including, the tertiary distribution system. Semi-technical irrigation does not have such water control and management facilities. The Government owns, operates and maintains the technical and semi-technical systems. Most of these systems are large scale gravity systems which depend directly on river flow. Village irrigation systems, as the

name implies, are smaller in scale and are owned, operated and maintained by villagers and with lesser degree of water control.

04.087 The total area of irrigated sawah in the Province is classified by the above categories as follows:

Technical Irrigation	444,873 ha
Semi-technical Irrigation	89,681 ha
Village Irrigation	201,102 ha
Total Irrigated Sawah	735,656 ha

04.088 The contribution of irrigation programs to the production increase of rice is two-fold, i.e., raising of yield and expanding of rice-planting area.

04.089 The yield-increasing effect of irrigation is particularly eminent when combined with fertilizer application. Conversely, use of improved varieties and fertilizers is effective only when it is practiced in adequately irrigated land. Hence the BIMAS program covers only such rice area and excludes rain-fed sawah or poorly irrigated land. In this sense irrigation work has contributed a great deal to the increase of yield by converting rain-fed sawah to irrigated sawah. The increase in rice harvested in recent years is due mostly to the increase in double cropping. However, the shortage of river water flow in the dry season is the main limiting factor for further increasing double cropping of rice, as most irrigation systems in Central Java depend on natural flow of rivers for water supply. Hence there has been construction of reservoirs to store water for the dry season supply was undertaken under Repelitas, the largest of which is the Sempor Dam to be completed in 1977. It is unlikly, however, that river waters in the dry season and those stored in existing reservoirs are fully utilized. There seems to still exist considerable potential for increasing double cropping by utilizing the presently available river flow in more efficiently.

04.090 Not less important than physical facilities is the improvement of the institutional set-up for idstribution and management of irrigation water. The possibility of increasing double cropping of rice by making full use of water flow in the dry season is well testified by the Tajum Irrigation Project completed in 1973 with a loan from Asian Development Bank.

04.091 The project consisted of construction of a diversion weir on Tajum River (a tributary of Serayu River), together with its related water conveyance and distribution system to utilize the river water (the flow in the dry season is about 4 tons per sec.) for dry season irrigation for more than 3,200 hectares. An outstanding feature of the project was the inclusion of a Pilot Scheme for the exploration, development and demonstration of advanced farming methods and for the efficient water management through the organization of "dharmatirta" (see, Chapter V, Section 5.4). The Pilot Scheme was assisted by Japanese experts under a bilateral technical cooperation arrangement.

4.2.4 Intensification Programs for Non-Rice Crops

04.092 As mentioned earlier, increasing production of both food crops and non-food crops was sought under the Repelita I, but little has been done by the Government for increasing non-rice crops during the Repelita I period. Given the economic, social and political circumstances during the period, the Indonesian Government had to concentrate its efforts and financial resources on increasing production of rice. It was not only to reduce the expenditure of foreign currency for importing rice, but more importantly to secure social and political stability of the country. Even after rice production had considerably increased during the Repelita I period, the Indonesian Government faced a critical hardship in 1972 when the domestic rice production fell (from 26 million tons of stalk paddy of previous year to 25 million tons) due to drought; the President himself had to travel throughout the world seeking supplies of emergency imports of rice, which was in world-wide shortage at that time.

04.093 It was therefore only recently that the Government could afford to start programs for increasing non-rice crops. Among various non-rice crops, priorities were given to palawija (non-rice staple foods), crops which are of high export possibility or would have import substitution effects, and crops for raising income of large number of smallholders.

04.094 To increase production of palawija, BIMAS/INMAS for maize was initiated in Central Java in 1974 following the pattern of BIMAS/INMAS Rice. BIMAS/INMAS Palawija includes maize, cassava, peanut and sorghum. The areas covered by BIMAS and INMAS for palawija in 1974/75 are presented in Table 4.4.

Table 4.4 Areas Covered by BIMAS/INMAS for Palawija, Central Java, 1974/75

		Plan (ha)	Realization (ha)	Rate of Realization (%)
Maize	BIMAS	43,948	31,389	71
	INMAS	45,857	20,558	51
	Total	89,805	51,947	58
Sorghum	BIMAS	280	28	10
	INMAS	324	-	-
	Total	604	28	4
Peanut	BIMAS	8,750	7,402	85
	INMAS	3,844	39	1
	Total	12,594	7,441	59
Soybean	BIMAS	5,375	1,824	34
	INMAS	4,320	298	7
	Total	9,695	2,122	22
Palawija	BIMAS	58,353	40,644	70
	INMAS	49,345	20,945	42
	Total	107,698	61,589	57

Source: Pemantapan Pelaksanaan BIMAS/INMAS. Dinas Pertanian Rakyat

It is noted from the Table 4.4 above that the realization rate is very low and that the area actually covered by BIMAS/INMAS was only a small portion of the area. BIMAS/INMAS for maize covered 10 percent of the total maize harvested area, that for peanut covered 17 percent, and that for soybean covered only 1.4 percent.

04.095 This low coverage of BIMAS/INMAS might be due to the reluctance of farmers to use fertilizers for palawija. Since the yield of palawija depends largely on rainfall, which fluctuates year by year, farmers consider that application of fertilizer to palawija is a risky practice. With respect to non-food crops, the National Governments effort was concentrated on the rehabilitation of state-owned estates, of rubber, oil palm and tea (mostly in West Java and North Sumatra) with assistance from international organizations, especially the World Bank, and foreign governments; the production of palm oil increased significantly in Sumatra as the result.

04.096 For small-holders a start has been made during Repelita I in providing supporting services to them as extension advice and the provision of seedlings, but the expenditures allocated to these services were so small that no appreciable result came out. And the discrepancy in productivity between estates and small-holders became wider. In Repelita II, with increased concern about income distribution and employment, more attention is being paid to the small-holders production.

04.097 The many small-holders of rubber, coconut and kapoc in Central Java, receive assistance from the Government in the form of free distri bution of nursery trees. The Provincial Government is also encouraging small-holders of rubber to organize cooperatives for joint processing. As a pilot project, the Provincial Government provided a cooperative with a processing plant costing about Rp. 1.5 million in 1972. However, these government programs for small-holders, due to the limitation in funds and personnel, cover only a small portion of the large number of small-holders.

04.098 Production of cloves by small-holders was encouraged by the subsidized distribution of seedings from government nurseries. A short-term credit program for small-holder cloves growers was also initated under Repelita II. Under this program, small-holders united into PMU (Project Management Unit) and receive credit from BRI (Bank Rakyat Indonesia) for purchase of matured trees, fertilizers and insecticides. There are two PMUs in Central Java, they received 50,000 trees per unit under this program. With respect to sugar, of which Central Java is the second largest producing province next to East Java, Repelitas envisaged that production would increase from 667,000 tons in the first years of Repelita I to 1,356,000 tons at the end of Repelita II. Much of this increase was expected to take place in outer islands. In Java the efforts were directed to increase the yield of sugar cane and to raise processing efficiency. However, the realization of production increase plans both in Indonesia as a whole and in Central Java were not satis-factory.

4.2.5 Livestock Programs

04.099 The National Government set a target for increase of livestock products of Indonesia for the Repelita I period. The plan aimed at increase of 100 percent for meat, 350 percent for eggs and 250 percent for milk. These targets appear to be based upon nutritional requirements of the nation but are not realistic from production point of view. The plan, however, indicated the relative importance of eggs and milk. The Provincial Government of Central Java places high priority on commercial chicken raising. BIMAS Chicken is carried out to assist commercial poultry raisers, and the Government operates 22 demonstration chicken farms. For kampung chicken, the Government distributes cocks of improved breeds to farmers.

04.100 For the development of dairy industry, the government gives priority to rural dairies rather than commercial dairies which are located in and around cities. The government established a milk center with cooling equipment, through which the dairy farmers ship their milk to the cities of Semarang and Surakarta. Other supporting services of the Government to dairy farmers are vaccination service and provision of frozen semen for artificial insemination.

4.2.6 Fishery Programs

04.101 The Government has been endeavoring to increase the marine fish catch through improvement or modernizing fishing boats and equipment. For this purpose loans from KIK (Credit for Small Scale Investment) are made available to fishermen for the purchase of motorized vessels and equipment. The present standard of this loan is Rp. 5 million for purchase of one vessel of 6 to 7 tons.

04.102 As the modernization of fishing methods requires improvement of skills and techniques, the Government is conducting training courses at the senior fishery high school at Tegal with assistance from the UNDP. Efforts by the Government are also directed to the increased production of brackish water culture by raising yield. The existing average yield of 270 kg per hectare of pond is low compared with the yield in other developing countries having similar conditions, such as the Philippines.

04.103 The demonstration ponds of the Government (there are 15 in the Province) are yielding about 800 kg. The Government is encourging the use of fertilizers for promoting plant growth in culture ponds. Loans are available to brackish water fishermen for the cost of rehabilitation and improvement of ponds, and purchase of fry, fertilizer and medicines. The standard of this loan is Rp. 124,500 per hectare of pond, 5 years repayment with one year of grace period.

04.104 At present the fry or fingerings to be cultured are collected from the sea by culture-fishermen themselves. The Government has started hatching of milk fish fry for distribution to culture-fishermen. The Government hatchery is in Jepara. The hatching of shrimp is also performed there, but as the motality rate of artificially hatched fry is high, work is still at the experimental stage. The Government also distributes fry of inland fish hatched at Magelang and Cilacap. The Cilacap hatchery has recently started the hatching and distribution of a kind of fish called Macrobrahim introduced from Hawaii.

4.3 Progress Achieved and Future Possibilities

4.3.1 Past Production Trends of Main Food Crops

04.105 There are two sources of statistics of rice production in

Indonesia: the Central Bureau of Statistics (BPS) and the Ministry of Agriculture.

04.106 For many years rice production figures have been gathered for Java and the outer islands by the Ministry of Agriculture, and for Java and Madura by PBS. The latter were based on yield reports for the purpose of land tax (IPEDA) calculation, and generally were considered to be underestimated. The statistics of the Ministry of Agriculture were based upon reports through the network of agricultural extension service, and the figures were generally higher than the BPS statistics. There were about one million tons difference every year between these two sets of statistics. But in 1970 BPS changed its statistical method by introducing use of a sample cutting survey and since then the BPS figures have been closer to the Ministry's figures.

04.107 This revision of BPS statistics made it difficult to evaluate the production increase before and after 1970 as a series. The annual growth rate of rice production during Repelita I period was officially given as 4.4 percent, but this rate is considered to be somewhat inflated by this revision. In addition to the above two sources, statistics at the provincial level are produced each respective provincial governments.

04.108 BPS and the Ministry of Agriculture release their figures for rice production on the national level with breakdown into provinces, but they do not publiccise further breakdown by kabupatens. Therefore, the statistics provided by the Provincial Government are used here, unless otherwise mentioned, for analizing past achievement and future possibilities in the Province.

04.109 The production figures of food crops in Central Java since 1960 are given in Table 4.5. The salient features of the food crop production during the period are: (1) the steady increase of rice production since the middle of the 1960's, (2)violent fluctuation of maize production (3) trend for sweet potato and cassava production to decline although the latter turned to upward in recent years, and (4) relatively stable production level of peanut and soybean, with an upward trend in recent years.

04.110 The yearly fluctuation of maize production is especially significant. Production in 1965, for example, was less than half that of the previous year, and that of 1966 was double 1965 production. It is also noted in respect to cassava and sweet potato that in 1976, the abnormally bad crop year, due to drought and insects (hopper), only these two root crops increased in production over the previous year.

04.111 The increase in rice production since the middle of the 1960's was due mainly to the increase in yield and to which the intensification programs of the Government, as mentioned earlier, which contributed great deal. The irrigation programs also contributed by increasing the double cropping areas and raising yields.

Table 4.5 Production of Main Food Crops in Central Java
1960 - 1976

(Unit: 1,000 metric tons)

	Lowland Rice (Dry Stalk Paddy)	Upland Rice (Dry Stalk Paddy)	Rice Total (Dry Stalk Paddy)	Maize	Cassava	Sweet Potato	Peanut	Soybean
1960	3,034	61	3,095	503	3,002	395	55	81
61	2,887	68	2,955	479	2,811	313	54	70
62	3,441	92	3,533	863	2,568	459	59	64
63	2,290	63	2,353	499	2,766	323	49	56
64	2,683	76	2,759	958	2,728	626	45	82
65	3,192	71	3,263	440	2,785	345	47	62
66	3,325	99	3,424	896	2,422	290	57	67
67	3,239	98	3,337	415	2,319	230	50	50
68	3,711	119	3,830	554	1,132	286	58	55
69	3,904	79	3,983	325	1,796	202	47	37
70	3,897	102	3,999	517	1,730	195	55	79
71	4,482	103	4,585	361	1,873	172	52	60
72	4,108	102	4,210	326	1,789	182	50	58
73	4,186	126	4,312	709	1,836	226	56	90
74	4,813	84	4,897	430	1,891	172	53	81
75	4,748	74	4,822	552	1,893	189	69	85
76	4,512	84	4,596	509	1,950	196	65	71

Source: Dinas Pertanian Rakyat, Province of Central Java.

04.112 The increase and decrease of palawija were mainly due to the increase or decrease of harvested area, the yield being relatively constant or stagnant. The harvested area, production and yield of rice and palawija since 1969 (the first year of Repelita I) are shown in Table 4.6.

04.113 The figures in the table indicate that there is a correlation between harvested area of rice and that of maize, in that the years of higher figures for rice harvested area correspond with the years of lower maize harvested area. Same relation is also observed, though to a lesser degree, between rice and cassava. The explanation may be that a larger area is planted with rice in the dry season when the rainfall is sufficient to irrigate the land and this result in reducing the area for palawija. The opposite would be the case in the years of short supply of water. And the figures also indicate that while the harvested area of rice has kept increasing the total area of palawija is declining.

4.3.2 Future Possibilities for Food Crops

(a) Projections for Rice Production and Demand on National Basis

04.114 The Provincial Government set targets for major food crops to be realized during the Repelita II period. These targets, however, are not based upon so-called scientific projections. Such projections have not been undertaken on a Provincial basis, but several projection studies have been made in or around 1970 on production and demand for rice in Indonesia as a whole. These studies are usually referred to by the following abbreviations of their titles.

NFS : National Fertilizer Study

RPIPE: Rice Production Intensification Program

RMS : Rice Storage, Handling and Marketing Survey

FAO : Perspective Study of Agricultural Development for Indonesia

IBRD : Agricultural Sector Survey Mission's Expectation

04.115 These studies, except for FAO used various factors which are usually employed in this kind of projection, such as population growth, income growth, income elasticity, production input, etc. FAO projected annual demand by simply multiplying 100 kg of milled rice by the estimated population of the respective years, on the assumption that the per-head consumption would not increase over that amount which was the approximate average of rice consumption per capita in the base year 1970. It projected the production of rice by extrapolating the past trend of growth at 2.1 percent per annum. The IBRD called its study

Table 4.6 Harvested Area, Yield and Production of Main Food Crops in Central Java, 1969-1976

(Units: Area in hectares, production in metric tons, and yield in ql./ha)

	Lowland Rice (Padi Sawa)[1/]			Upland Rice (Padi Gogo)[1/]			Maize			Cassava			Sweet Potatos		
	Area	Yield /ha	Production	Area	Yield /ha	Production	Area	Yield /ha	Production	Area	Yield /ha	Production	Area	Yield /ha	Production
1969	1,240,485	31.47	3,904,149	52,170	15.24	79,552	454,651	7.15	325,321	349,259	51.39	1,796,440	49,248	41.11	202,480
1970	1,204,464	32.35	3,897,073	54,492	18.84	102,696	690,729	7.49	517,401	321,844	53.75	1,730,003	47,790	39.48	195,490
1971	1,262,848	35.44	4,482,714	58,522	17.60	103,043	504,667	7.11	361,950	346,411	54.02	1,873,530	43,225	39.94	172,657
1972	1,242,079	33.06	4,108,533	52,379	19.61	102,733	419,775	7.76	326,047	357,150	50.33	1,789,390	44,974	40.55	182,370
1973	1,256,113	33.32	4,186,367	62,045	20.34	126,256	878,014	8.49	709,643	344,929	53.24	1,836,618	52,316	42.64	226,101
1974	1,354,481	36.99	4,813,921	51,078	17.27	84,220	496,065	8.68	430,999	321,610	58.26	1,891,288	39,502	43.14	172,791
1975	1,281,097	37.92	4,748,756	40,921	17.63	74,369	527,622	11.62	552,742	312,561	62.35	1,893,065	39,126	46.12	189,370
1976	1,136,743	39.70	4,512,256	44,353	19.08	84,639	471,998	10.79	509,368	312,933	60.59	1,950,725	40,637	48.44	196,880

	Peanut			Soybean			Small/Green Pea			Sorghun		
	Area	Yield /ha	Production	Area	Yield /ha	Production	Area	Yield /ha	Production	Area	Yield /ha	Production
1969	76,575	6.23	47,683	76,520	4.85	37,147	-	-	-	-	-	-
1970	84,198	6.62	55,770	152,889	5.19	79,291	-	-	-	-	-	-
1971	79,643	6.61	52,559	133,986	4.54	60,919	-	-	-	-	-	-
1972	83,585	6.04	50,473	121,723	4.78	58,276	-	-	-	-	-	-
1973	93,006	6.16	56,395	181,978	5.22	90,790	-	-	-	-	-	-
1974	89,735	5.94	53,481	161,010	5.06	81,591	-	-	-	-	-	-
1975	101,730	6.83	69,435	145,173	6.17	85,804	-	-	-	-	-	-
1976	92,097	7.07	65,114	125,879	5.71	71,929	17,536	3.52	6,187	11,752	6.06	7,132

Note: 1/ Production of rice is of dry stalk paddy.

Source: Dinas Pertanian Rakyat Jawa Tengah.

results as "expectation", instead of "projection" because it did not undertake its own projection but made its judgment based on the projections made by others.

04.116 The projected figures of these studies are shown in Table 4.7 together with the figures of actual production in 1974 and 1975 which are now already known.

Table 4.7 Projected Demand and Production of Rice in Indonesia

(Unit: Million tons of milled rice)

1/		1970 (Base Year)	1974	1975	1980
Projection					
NFS	D 2/		14.60		19.30
	P 3/	11.74 (in 1969)	14.60		19.35
RPIPE	D		14.32	14.92	
	P	12.12		15.41	
RMS	D			14.51	17.40
	P	12.05		14.71	17.49
FAO	D			13.5-13.7	16.6
	P	11.70		12.12	13.50
IBRD	D				
	P	11.99		High 15.5	H 18.1
				Low 14,5	L 16,6
Realization					
	D				
	P	Old 11.99			
		Revised 13.14		15.34	

Notes: 1/ For definitions of the acronyms, see the text.
2/ Stands for "Demand".
3/ Stands for "Production".

Source: NFS, RPIPE, RMS, FAO, and IBRD

Three studies -- i.e., NFS, RPIPE, and RMS -- out of the five predicted that production and demand would balance in 1974 or 1975. However the FAO study predicted widening of the gap between production and demand, and that the gap would reach some 3 million tons in 1980. The situation which actually existed in 1975 was that the country produced 15.3 million tons but still had to import about 0.7 million tons to meet demand.

04.117 In summary, three studies, i.e., NFS, RMS, FAO, projected lower production than actually took place. Production projections by other two studies, i.e., RPIPE and IBRD, were about equal or slightly higher than actual. However, the increase of production from the base year 1970 which these two studies had projected were larger than actual increase. In other words, they projected a higher growth rate of production than actually realized, since the production figure of the base year (1970) which these two studies used as the base was 12 million tons as officially estimated at the time of their studies. But later, the figure was revised by the Central Statistic Bureau to 13 millions. This means that, if the revised figure was really "actual", the increase from 1970 to 1975 was smaller than these two studies predicted.

04.118 Another variance of the production projections from actual development was that all of the studies had foreseen the larger expansion of rice area in outer islands and smaller increase of yield in Java than what actually happened.

04.119 In projecting demand, all studies under-estimated the increase of demand. Since the studies were undertaken, at least helped by, foreign exports from Western countries, it is not unnatural that they under-estimated the strong preference of Indonesian people to eat rice; the income elasticity was much higher than expected.

04.120 Although these studies had made some mistakes in their assumptions as mentioned above, they still serve as lessons for projecting and planning the future development of the staple food production in Central Java.

(b) Provincial Targets for Main Food Crops and Possibilities of Realization

04.121 The targets set by the Provincial Government for harvested area, production and yield in 1983, together with the actual figures for 1975 are presented in Table 4.8.

04.122 The above target for 1983 calls for 2,808,000 ha of harvested area in total for major food crops, which is 391,000 hectares larger than the 1974/76 average. This target for harvested area seems to be too high, since almost all cultivatable land in the Province is already being fully used. Moreover, the expansion of city areas, industrial sites, and construction of dams, roads and canals, will result in decreases of agricultural land area.

Table 4.8 Actual Production and Production Targets of Food Crops in Central Java, 1970-1983

(Units: see notes)

		1970	1974/76 Average	1983
Lowland Rice (Padi Sawah)	A.1/	1,204	1,251	1,350
	P.2/	3,987	4,691	5,472
	Y.3/	32.35	38.20	40.54
Upland Rice4/ (Padi gogo)	A.	54	45	52
	P.	102	81	123
	Y.	18.84	17.99	23.50
Maize (Jagung)	A.	690	498	610
	P.	517	497	738
	Y.	7.49	10.03	12.10
Cassava	A.	321	315	375
	P.	1,730	1,911	2,372
	Y.	53.75	60.40	63.36
S. Potato	A.	47	40	61
	P.	195	186	274
	Y.	39.47	45.89	45.03
Peanut	A.	84	94	105
	P.	47	62	92
	Y.	6.23	6.61	8.75
Soybean	A.	152	144	175
	P.	79	79	134
	Y.	5.19	5.64	7.69
Mungbean (Kacang-Hijau)	-	-	14	45
	-	-	6	27
	-	-	4.26	6.00
Sorghum	A.	-	10	35
	P.	-	11	50
	Y.	-	9.83	14.50

Notes: 1/ Harvested area in thousand hectares.
2/ Production in thousand tons.
3/ Yield in ql./ha.
4/ Production and yield of paddy is of stalk paddy.

Source: Dinas Pertanian Rakyat.

04.123 The possibility of increasing harvested area, therefore, lies in more intensified use of available land rather than by increasing multiple cropping. In fact the increase in harvested area of lowland rice (padi sawah) in recent years was due mainly to the increased second cropping of rice in the dry season. It must be noted, however, that the increase of double cropping of rice will result in the decrease of harvested area of palawija which have been planted on sawah in the dry season.

04.124 While the target envisages the increase in harvested area or rice, including upland rice, by 100,000 ha above the 1974/76 average, it also envisages the increase of palawija harvested area of 290,000 ha. The increase of rice harvested area of this magnitude would not be difficult. However, increase in palawija harvested area of 290,000 ha is hard to expect in view of the decreasing trend of palawija area and continuing increase of double cropping of rice.

04.125 For setting more realistic targets, such factors as demand prospects, availability of land and possibility of raising yield have to be carefully examined.

(i) Rice

04.126 From the demand side, the need for increasing rice production in Central Java is great because of the need to supply an adequate amount of rice to the huge population of the Province.

04.127 According to the Rice Storage, Handling and Marketing Study mentioned earlier (RMS Study referred to in Section 4.3.2), the national average consumption of rice in 1970 was about 100 kg of milled rice per capita per year, but there were considerably large difference among regions; the highest was 150 kg in Aceh in Sumatra and the lowest was 18 kg in West Irian. The figure for Central Java was 80 kg which was second lowest among all provinces.

04.128 As the result of production increases since 1970, the per capita consumption in Central Java reached the 100 kg level in 1975, but it is still far below 120 kg level which was the national target under Repelita I. And even if the production targets for both lowland rice and upland rice are fully attained in 1983, the per capita consumption would be still 101.8 kg as calculated below, and, therefore, a higher target is needed from the demand side.

	(Production of Lowland Rice (ton)	+ Production of Upland Rice (ton))	x Normal Wastage	x Conversion to Milled Rice	÷ Population	= Per Capita Consumption (kg)
1975:	(4,748,756	+ 74,369)	x 0.94	x 0.52	÷ 23,387,000	= 0.1008 = 100.8
1983:	(5,472,900	+ 123,375)	x 0.94	x 0.52	- 26,850,676	= 0.1018 = 101.8

Note: The population in 1975 is the BPS estimate. For the population in 1983, see Table 2.13.

04.129 From the production side, the targeted increase of 100,000 hectares of harvested area above 1974 to 1976 average seems to be possible. Ongoing irrigation projects such as the Sempor Project and the continuing improvement of irrigation water management will contribute to the increase in double cropping of lowland rice in the dry season. If the implementation of the Jratunseluna Development Plan starts early, a still larger increase in harvested area would be possible.

04.130 With respect to the yield of lowland rice, the targeted yield in 1983 is 40.54 quintals ql. per hectare. This target seems to be too low, because the yield in 1976 already surpassed the target for 1981 and was almost equal to the target for 1982, as shown below:

	Actual Yield (ql./ha)	Target Yield (ql./ha)
1970	32.35	
1971	35.44	
1972	33.06	
1973	33.32	
1974	36.99	
1975	37.92	
1976	39.70	
1977		38.15
1978		38.36
1979		38.55
1980		39.08
1981		39.57
1982		39.77
1983		40.54

Source: Dinas Pertanian Rakyat

04.131 In view of the highest priority possible placed by the Government on rice production, and of the program for strengthening extension service to be commenced soon with IBRD assistance, the yield of lowland rice may possibly be raised to 42 quintals per hectare.

04.132 With the harvested area as targeted for 1983 and the yield of 42 quintals per hectare, the production of lowland rice can be 5,670,000 tons. The target for upland rice seems to be adequate. The area planted with upland rice is small now because growing upland rice is not attractive to farmers because of low yield at present. But, there is possibility of raising the yield of upland rice as mentioned later (see Section 4.4.2).

04.133 Adding the target production of upland rice (123,375 tons)to the above mentioned 5,670,000 tons of lowland rice, the total production of rice in 1983 will be 5,793,000 tons and per capita supply will be 105.4 kg.

(ii) Maize

04.134 Maize, together with cassava and sweet potato, is consumed almost entirely for human food, substituting for rice. As the supply of rice increases and the income level of the people rises, the consumption of these rice-substitution crops will decrease. The possibility of exporting maize from Central Java is very small because the maize produced in the Province is mostly white maize, not yellow.

04.135 The possibility of an increase in demand for maize as animal feed depends on the development of animal industry in the Province and also on the price relation between maize and other feed crops, especially sorghum.

04.136 The production target for maize, set at 48.5 percent higher above 1974 to 1976 average, seems too high. If the targeted production is attained in 1983, and if per capita consumption even remains at the same level as 1974 to 1976, there will be a surplus of 240,000 tons, and it is hard to expect that the animal industry in the Province will develop to demand such a large amount of maize by that time.

04.137 The production target, therefore, may better be set at the same level as the 1974 to 1976 average, i.e., 497,703 tons, but at the increased yield as targeted, i.e., 12.10 quintals per hectare. Consequently, the area needed for harvesting the above-targeted production would be 411,324 hectares, which is 87,237 hectares less than the harvested area of 1974 to 1976 average. And, at this amount of production, per capita consumption, in 1983, allowing 6 percent normal wastage, would be 17.4 kg compared with 20 kg in the 1974 to 1976 average.

(iii) Cassava

04.138 The same holds for cassava as for maize, the consumption of cassava as human food will decrease. The possibility of increasing demand of cassava for animal feed will depend on the development of the livestock industry. Another possibility is the export of cassava in the form of flour and pellet, but the competitiveness of a cassava-processing industry in the Province with those in outer islands is questionable.

04.139 For targeted production of cassava, the same thought as for maize will apply, namely, maintaining the present production level with higher yield as shown below.

Production:	1,911,692 tons (same as 1974/76 average)
Yield:	63.36 quintals per hectare (same as target)

The area needed for the above production will be 301,719 hectares which is 13,982 hectares less than 1974 to 1976 average. The per capita consumption (simple division of production by population) will be 71.2 kg as compared with 81.7 kg in 1974 to 1976.

(iv) Sweet Potato

04.140 The production of sweet potato, another rice-substitute but of less importance than maize or cassava, declined sharply in 1960's and has been stagnant since 1970. The production target set at 47.3 percent higher than the 1974 to 1976 average seems unrealistic.

04.141 The production target should be no more than the 1974 to 1976 average, i.e., 186,347 tons.

04.142 The targeted yield of 45.03 quintals per hectare is apparently too low. The yield of sweet potato has continued to increase since 1970 and was 48.44 quintals per hectare in 1976, surpassing the target for 1983.

04.143 Increasing yield of sweet potato is relatively easy, by the propagation of high-yielding varieties, without other inputs. The yield may safely be targeted at 55 quintals per hectare. Then the harvested area for producing 186,347 tons will be 33,881 quintals per hectare, which is 5,894 quintals per hectare less than 1974 to 1976 average.

(v) Leguminous Crops (Peanuts, Soybean and Mungbeans)

04.144 Peanut and soybean are important food crops, as a source of protein for the people of Central Java. The production of these two leguminous crops has been on an upward trend in recent years, and the demand for them is likely to increase.

04.145 The production targets for peanut and soybean are set at 48.3 percent and 69.6 percent respectively above 1974 to 1976 average. In view of the possibility of increasing demand and raising yield, as mentioned later in Section 4.4.4(a), these targets are to be considered as the minimum level of production to be attained in 1983.

04.146 Mungbean is a minor food crop and the production is small, but a high rate of increase (4.5 times of 1974 to 1976 average) is targeted.

04.147 This high target may be justified on the ground that mungbean is easy to include in cropping rotation because of its short maturity period and also because it is adaptable to inferior natural conditions. The production increase of this crop may be advisable in "minus" areas (see Section 4.4.6).

(vi) Sorghum

04.148 Sorghum production in Central Java developed only recently and it is difficult to predict its future. Although sorghum is inferior to maize as human food it can be used as animal feed. As sorghum is more resistant to drought, the production may well be promoted in minus areas in combination with livestock raising as suggested later in Section 4.4.6. And in this sense, the high rate of increase of sorghum production as targeted may be justified.

(vii) Summary

04.149 In summary, the targets set by the Provincial Government are too low for rice and too high for rice-substitution crops. The targets viewed as a whole assume too much expectation on the increase of harvest area. On the other hand, yields for some crops like lowland rice and sweet potato may possibly be raised higher than targeted.

04.150 Recommended targets or projections for the respective crops are summarized in the Table 4.9, in comparison with 1974 to 1976 average.

04.151 While the recommended targets for rice are expected to be realized both by increase in harvested area and yield, the production targets for rice-substituting crops (maize, cassava and sweet potato) are set at the same level as 1974 to 1976 but with higher yield, so that the present level of production may be maintained with less harvested area.

04.152 The total harvested area in 1983 is expected to be almost the same as it was in 1975 and slightly higher than the 1974 to 1976 average.

04.153 Within the total harvested area, the share of rice increases and that for palawija decreases. Within Palawija, the share of leguminous crops and sorghum increases and that for rice-substituting crops decreases. As the result, per capita intake at the estimated population in 1983 of staple foods constitute a larger amount of rice and protein-rich crops than in 1974 to 1976 and smaller amount of maize, cassava and sweet potato.

04.154 It must be emphasized that the efforts for a more intensified cropping pattern for palawija is necessary in order to maintain the same level of the harvested area as of 1974 to 1976 average, because, as mentioned earlier, the land available for palawija will become smaller as double cropping of rice increase.

(c) Possibility of Horticulture Development

04.155 Very little attention has been given by the Government to the development of horticulture. It was only from 1976/77 that INMAS Horticultural started in the Province.

Table 4.9 Targets for 1983[1/]

	Production (tons)	Harvested Area (ha)	Yield (ql./ha)
Lowland Rice	5,670,000 (4,691,634)	1,350,000 (1,257,440)	42.00 (38.20)
Upland Rice	123,000 (81,075)	52,000 (45,450)	23.50 (17.99)
Rice Total	5,793,000 (4,772,709)	1,402,000 (1,302,890)	
Maize	497,703 (497,703)	411,324 (498,561)	12.10 (10.03)
Cassava	1,911,692 (1,911,692)	301,719 (315,701)	63.36 (60.40)
Sweet Potato	186,374 (186,374)	33,881 (39,755)	55.00 (45.89)
Peanut	91,875 (62,676)	105,000 (94,520)	8.75 (6.61)
Soybean	134,575 (79,774)	175,000 (144,020)	7.69 (5.64)
Mungbean	27,000 (6,424)	45,600 (14,561)	6.00 (4.26)
Sorghum	50,750 (11,042)	35,000 (10,504)	14.50 (9.83)

Note: 1/ Figures in parenthisa are 1974/76 average.

04.156 There are two directions which may be taken for the development of horticulture in the Province. One is the upgrading of home-garden production and the other is the promotion of commercial horticulture in specific areas.

04.157 Since home-garden horticulture is practiced by millions of farmers throughout the Province, it would be very difficult, if not impossible, for the extension services limited number of technical staff to cover all of them. However, the yield and quality of vegetables could be greatly improved by the use of better seeds. The supply of vegetable seeds at low cost, as will be discussed later, would be the most effective way to aid home-garden horticulture.

04.158 The promotion of commercial horticulture will be somewhat similar to the recent development of commercial egg production around big cities (see Section 4.1.5). Beside the areas near big cities, commercial production may well be developed in highland areas, taking advantage of the cooler climates there. There are good examples of commercial vegetable growing in Southeast Asian countries. In the low-land area around Bangkok, there are specialized vegetable farmers producing vegetables throughout the year by irrigation. The highland of Baguio (about 250 km north of Manilla and at an elevation of about 1,500 m) is famous for the production of temperate vegetables which are supplied to Manilla). Also in the Philippines, the highland of Claveria (elevation, 900 m) of Mindanano Island is specialized in production of tomatoes which are shipped by vessels to Manilla. There the seed farm of the Philippine Government (Bureau of Plant Industry) developed an excellent variety of tomato, named BPI No.2, and distributed the seeds to farmers in the area, and gave technical guidance. The variety is highly resistant to diseases and yields are as much as 200 to 300 fruits per plant (35 tons per hectare). The village is now very wealthy.

04.159 It appears that seed production is the major constraint to the development of vegetable production in the Province.

04.160 As is well known, yield and quality of vegetables depend greatly on the quality of seed, but vegetable seeds are difficult to produce under tropical climate. Good seeds can be obtained only in temperate climate.

04.161 The cool temperature of highland areas should be fully utilized for vegetable seed production. Not only the cool temperature but the difference of temperature between daytime and night is an important factor for producing good seeds, and the highland in tropic zone has a great advantage for seed production in this respect too. The highland areas of the Province could be a center of vegetable seed supply not only for the vegetable production in lowland areas of the Province but also for other parts of the country and even for other tropical countries in Southeast Asia. In fact, the highlands in Taiwan is utilized for producing vegetable and flower seeds for export to various tropical countries.

4.3.3 Livestock Development Possibility

04.162 The progress made in the livestock subsector during Repelita I, according to the Provincial Government estimate, in terms of the annual growth rate of production, was 8.4 percent for meat production, 1.1 percent for milk production and 6.4 percent for egg production.

04.163 The high growth rate of meat production is the result of higher prices which induced farmers to sell their cows, which, however, caused the decrease of the animal population. The high growth rate of egg production was due to the development of commercial egg production. The low rate of milk production growth is attributed to the low income of the people, but it may be partly to the low quality of milk. Because of low quality of fresh milk, consumers prefer reconstituted milk from Jakarta. The low quality of fresh milk is caused by deterioration due to the lack of proper facilities for storage and transportation and also by the malpractice of adding water to the milk.

04.164 With respect to the future possibility of livestock development, the Provincial Government expects the annual growth rate during Repelita II to be as follows: 2.5 percent for meat production, 10 percent for egg production and 8 percent for milk production.

04.165 The increase in meat production is estimated at a much lower rate than the actual growth during the Repelita I, because of consideration that an excessive increase would reduce the cow population which in turn would cause the shortage of cows for draft purpose. Since, however, demand for beef will continue to grow, the setting of a low target for meat production would not solve the problem. One solution would be to increase the production of chicken meat at lower cost per kilograms and encourage the substitution of chicken meat for beef.

04.166 The estimate of 10 percent annual increase of egg production may be realized or it may grow at still higher rate, if the Government Continues to give priority to the commercial egg production.

04.167 The Provincial Government started an intensification program for kampung eggs in the beginning and later changed it from kampung eggs to commercial eggs production. Kampung poultry are raised all over the Province and it is inefficient to spread the Government efforts sparsely. This is especially true for the prevention of Newcastle disease. The small size of the average village flock makes vaccination costly due to the wastage of vaccine which is packed in 100-dose ampoules. Concentrating efforts on commercial production which is concentrated in certain areas near the consuming cities is much more effective.

04.168 With respect to the future possibility of milk production in the Province, the main constraint is the very limited area available for forage and feed production.

04.169 Some foreign obsecuers are pessimistic about the dairy industry in Java and recommend the promotion of reconstituted milk industry which would depend on import of powdered skin milk as its material; they consider that the production increase and quality improvement of milk in Java would be unjustifiably costly. Some others recommend development of dairy industry for processing milk in the outer islands; Medan area of North Sumatra is specifically recommended for such development.

04.170 However, the feasibility of development of rural dairy industry in Central Java, as well as for other provinces in Java, should not be considered only from the viewpoint of meeting demand for milk in the Province; the increased supply of reconstituted milk would be more easy in this respect. The development of rural dairies should be considered as a means of raising the income of farmers, as dairy farming is an labor-intensive type of agriculture. The rapid increase in Japan of milk production after the War took the form of labor-intensive dairies, utilizing very limited land for feed production.

04.171 The limitation of land for forage and feed crop, which is the largest constraint for dairy development in the Province, may possibly be overcome.

04.172 Since maize and cassava are abundant in the Province and sorghum production has been increasing in recent years, the dairy industry is in a good position as far as the supply of concentrate feeds are concerned. The problem is the supply of roughage fodder, but this may well be solved by more efficient use of land such as planting fodder crops in rotation or inter-cropping with other crops. The use of the leaves of some leguminous trees which may be planted as a part of an arbor program would also help solving this problem.

04.173 Programs for developing dairy industry in the Province, however, should not be spread over large areas, but be confined to some specific areas, integrating with the development of other sectors of agriculture in that area.

4.3.4 Fishery Development Possibility

04.174 The catch of sea fish has increased considerably in recent years: from 28,400 tons in 1970 to 51,678 tons in 1976 (see Section 4.1.6). The increase is mostly due to the motorization of fishing vessels.

04.175 The most significant aspect of the fishing industry recently is the rapid increase in export of shrimp, almost all of which was sent to Japan. The export of shrimp from the Province in 1976 was 3,175 tons and US$14.3 million in value.

04.176 The production and catch of brackish water culture and inland fishery have been stagnant. There seems to be a large possibility of increasing sea-fish catch and production of brackish water fish culture. The former will be realized by further modernization of fishing vessels and the latter by raising yield.

04.177 With respect to the markets for fish, the domestic demand for fish is potentially great. The present level of fish consumption for food is surprisingly low in the Province, estimated at about 3 kg per capita per year which is only about one-third of the national average. This low consumption of fish in the Province is attributed to the lack of efficient marketing, and poor transportation of fresh fish; at present fresh sea fish is almost not within the reach of inland people.

04.178 There is one problem which is likely to be caused by the modernization of fishing vessels i.e., the problem of small fishermen. As noted earlier the motorization has been concentrated in Pekalongan and as a result the number of fishermen decreased there, not only in the City area but in Kabupaten Pekalongan. The decrease means that some fishermen have ceased to be independent fishermen. Some of them might have been employed as laborers by larger fishermen or fishing companies. Some might have been absorbed in the non-fishery sector.

04.179 As motorization advances in other parts of the Province, the same phenomena will occur. The shift of labor from an inefficient fishery to more high productive type of fishery or other industries is of course desirable for the economic development of the Province. If, however, those small fishermen who can not modernize their equipment are unable to get employment, it will cause a social problem. Yet, it would not be wise to check or slow-down motorization solely from this social consideration, because, even if Central Java keeps the present small fishermen, larger vessels will come from provinces other than Central Java, as is already taking place.

04.180 The National Government (Directorate General of Fishery) is considering to remove a part of small fishermen from the coast of Central Java to other islands. The plan envisages construction and improvement of fishing harbors to serve as the bases for fishing activities of these transmigrated fishermen at the following locations: Sungai Liat (Bangka Island), Tanjun Pandan (Binton Island), Teluk Batang (West Kalimantan), Semuda (Central Kalimantan), Bawean Island belonging to East Java Province, and Karimunjawa Islands belonging to Central Java.

04.181 Another problem entailed in the modernization of fishing vessels and gears, for instance the use of echo sounders, is that of preservation of fish resources of the Java Sea. This problem would not be of immediate or even near-future concern, but has to be carefully considered.

04.182 According to the view of the Provincial fishery agency (Dinas Perikanan, Provincial Government), the present fishery operation in the Java sea is utilizing only 30 percent of the allowable catch. It is not known, however, whether this estimate is well supported by scientific study. Even if this estimate is correct, it would not take a long time to reach the maximum, that is 3.3 times the present catch, if the modernization of equipment advances and also more vessels come from other parts of the country. The catch of bottom fish by trawlers, which is particularly increasing in recent years, will speed up the reaching of the allowable maximum, because bottom fish resources are easier to be depleted than surface fish or pelagic fish.

04.183 It is important, therefore, not only for Central Java but for the nation as a whole to ascertain the fishery resources in Java Sea by use of scientific methods, and then calculate the amount of catch which makes the maximum use of the resource without depleting the resource stock, i.e., to maintain the sustained maximum yield.

04.184 Based on the result of scientific survey on the resource, the National Government should regulate the fishing activities in the Java Sea. And it is general practice for such regulation that number of vessels and/or the amount of catches be allocated to the provinces from where fishermen operate on the sea area. The allocation is generally made according to the past performance, i.e., the province which has been catching larger amount gets a larger allocation.

04.185 From the Provincial point of view, therefore, it would be a wise policy to expedite motorization so that the Province will receive a higher allocation when the regulation as mentioned above is set in the future.

4.4 Major Issues and Suggestions

4.4.1 Continuation of High Priority for Rice Production

04.186 Top priority in agriculture policy of, both Central and Provincial Governments, has been placed on rice production during Repelita I. Although government's effort for other crops were increased under Repelita II, rice production is still receiving highest priority.

04.187 In recent years, however, proposals and suggestions to modify this heavy concentration on rice have been presented, advocating diversification of crops including livestock.

04.188 Modification by the Government of the policy in line with these suggestions has not been made clear, but the change of the price and distribution procedures of fertilizers, announced in May 1976, is interpreted as an indication of the Government policy in favor of non-rice crops. The change was that the price of fertilizer became equal

to BIMAS farmers, non-Bimas farmers and estates, i.e., non-Bimas farmers and estates can now buy fertilizers at the subsidized price. At the same time the price of fertilizer (urea, TSP, NPK) was reduced from Rp.120 per kg to Rp.80. Another change in favor of non-rice farmers was the equalization of bank credit charges to BIMAS farmers and to producers of export crops; the latter had been paying at higher rate.

04.189 Some arguments in favor of diversification are based on the belief that Indonesia could gain more by increasing agricultural exports than saving imports of food by increasing self-sufficiency. Other arguments, such as presented by FAO and IBRD, are more compromising and specific. They support the present policy of increasing rice production, but propose that the effort should be concentrated on the rice production in lowland (sawah) in the wet season and diversify the production in the dry season. This proposal is based on the fact that the optimal water requirement of rice is about twice as high as those for non-rice crops, which means that with same amount of water available in dry season more land can be irrigated for non-rice crops than for double cropping of rice.

04.190 They also consider that the resultant decrease in rice production in Java might be, in a long rage, be offset by the increase in outer islands.

04.191 National policy issues such as this may be outside the scope of the regional planning study, but the following point should be made on the agricultural development of Java as against outer islands.

04.192 The sharp contrast between the two portions of the country is the scarcity of land with over-population in Java and the existance of vast unutilized land area in outer islands where there is a shortage of labor to develop it. The logical conclusion from this fact is that the agricultural development in Java should rest on labor intensive farming and that for the outer islands on the labor-saving type of agriculture. Rice production is much more labor intensive and among non-food crops cotton and tobacco are labor intensive.

04.193 While maize and cassava can be grown on large scale mechanized farms, as is practiced in Lampung Province, the mechanization of rice production, as is practiced in U.S. and Australia, is only possible under the complete control of irrigation water. Such an irrigation system does not exist in the outer islands and, if it is to be constructed there, a vast amount of capital investment is required.

04.194 In addition, rice can feed a larger number of people from the area on which the crop is grown than other grains do. Although root crops such as cassava and sweet potato may produce more calories from the unit area than rice, they can not substitute for rice as staple food, because of its bulkiness.

04.195 Javanese farmers have strong or almost instinctive preference to rice growing; wherever there is land and water, they grow rice. It would be very difficult for the Government to persuade farmers to use the irrigation water for non-rice crops. It is especially so in Java where the growing of non-rice crops with irrigation has not been practiced before, except for sugar cane growing by estates.

04.196 In addition to the above mentioned difficulties, there is another technical difficulty in planting non-rice crops under irrigation. The present system of irrigation in the Province is designed to supply continuous water flow to flooded rice, with water flowing from field to field. Non-rice crops can not be grown under this irrigation system, because these crops can not tolerate the flooding conditions of the field. In order to grow a non-rice crop under irrigation, the system has to be changed from the present "plot-to-plot" system to the system whereby every plot takes water directly from ditches, as is practiced in Japan and Taiwan. But, if this improved system is completed in Java, farmers will stick more to rice growing, because the new system will bring about a higher yield of rice, as Japanese and Taiwan farmers are getting. On the basis of the reasons given above, it is recommended that the top priority objective in agriculture development, namely to increase rice production be continued in Central Java during Repelita II. Further, it should be continued until such time when rural population pressure in the Province is eased by the movement of people to non-agriculture sectors or to outside the Province, although that is not expected in the foreseeable future.

4.4.2 Efforts for Increasing Yield of Rice

04.197 The increase of rice production since the middle of the 1960s has been mainly due to the increase in yield and to a lesser degree to the increase of harvested area by double cropping of rice.

04.198 In order to continue to increase production, it will be necessary to accelerate ongoing and scheduled irrigation projects and to strengthen the intensification programs.

04.199 With respect to the intensification program, there are two phases of technical advancement. One is the expansion of BIMAS coverage. The BIMAS covers farmers in irrigated areas, and as the irrigation improvement advances the coverage will expand. For these newcomers relatively uniform technical guidance may be sufficient. On the other hand, for those farmers who have already raised their yield under BIMAS; more advanced guidance is necessary. It may be relatively easy to raise the yield from the level of, for example, 3 tons (stalked paddy) per hectare to 4 tons, but it is much more difficult to raise from it 4 tons to 4.5 tons. A higher degree of technology is necessary for the latter, the techniques applicable at this level differ from area to area, and more intensive guidance becomes necessary.

04.200 For this purpose, the difference in yield by areas must be carefully analyzed so that most effective methods of increasing yield may be found.

04.201 While the average yield of rice in the Province is 3.79 tons per ha, the highest kabupaten yield is 5.5 tons for Platen and the lowest is 2.11 tons for Batang. The high average yield of Klaten is primarily attributed to the high ratio of technically irrigated area, whereas a large portion of the paddy fields in Batang and other low-yielding kabupatens such as Rembang and Demak are still rain-fed, indicating clearly the importance of irrigation for obtaining high yields. A comparison should then be made among the average yields of irrigated area by kabupaten, i.e., excluding rain-fed area from kabupaten averages, in order to identify other factors than the availability of water, of which soil fertility may be important factor for the difference in yield.

04.202 A fairly detailed survey on soil distribution in the Province has been completed by the National Agricultural Research Institute with a view to determine recommendations for the amount and combination of fertilizers by areas. The areas of the Province are mapped at 1/250,000 scale, and the soil is classified into two categories: phosphate-sufficient area and phosphate-deficit area. It will be an important task of the extension service of the Province to work out recommendations for fertilizer application for each areas. The strengthening of applied research or experiments on Provincial level, as is discussed later, is very necessary in this respect.

04.203 Although most of the rice grown in the Province is lowland rice (padi sawah), upland rice is also grown in dry land and is an important crop in some mountanous areas especially in kabupatens Wonogiri and Boyolali. But the yield of upland rice is very low, the Provincial average being 19.08 quintals of stalk paddy per hectare as against the 39.40 quintals for lowland paddy (figures for 1976; see Table 4.2).

04.204 Despite the fact that upland rice is widely grown in the outer islands of Indonesia, it was only recently that the National Government began efforts for increasing its yield. Research on varieties of upland rice, both indigenous and introduced, are carried out in Bogor (Muara Seed Farm). A pilot project for increasing yield of upland rice is also carried out on regional basis under the Agricultural Development Project in Lampung (Lampung Tanimakmur Project) with technical assistance from the Japanese Government.

04.205 While the average yield of upland rice in Lampung is even lower than that in Central Java, the trials in the Project area on 39 farmers' fields (each 100 sq. meters) showed the average yield of 21.7 quintals of rough rice 1/ (about 30 quintals of stalk paddy) per hectare

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1/ Conversion rate of rough rice into stalk paddy is rough nice 1 to stalk paddy 0.77.

with application of fertilizers (100 kg each of urea and TSP per hectare). Of the 16 varieties tried, the highest yield was 38.9 quintals of rough rice (about 50 quintals of stalk paddy) obtained with the local variety, Genjah Lampung. Although the high-yielding variety (Bicol) introduced from the Philippines gives still higher yield, it is not recommended for the Project area because it is more susceptible to blast disease than local varieties.

04.206 The yield of upland rice in Central Java may be raised by the use of proper varieties with application of fertilizers. The advantage of Central Java for upland rice is the abundance of available labor in contrast to the outer islands where a shortage of labor for weeding is a problem. Three weedings are necessary for good yield of upland rice, which require 60 to 75 man-days per hectare, according to a study made in Lampung.

4.4.3 Prevention of Disease, Insect and Rat Damage

04.207 There are considerably large discrepancies between the planted area and harvest area for all crops in every year, indicating the loss by flood, drought and insect or disease damage. The rice harvested area, 1974 to 1975 average, for example, was 1,317,792 hectares against the planted area of 1,401,754 hectares. The numerical difference indicates only the area totally or severely affected, but the decrease in yield on harvested area is hard to estimate.

04.208 The favored climate of the Province which permits the growing of various crops throughout the year is also favorable to bacteria, insects and rats. The more intensive cultivation and larger input of fertilizers are factors which serve to increase these enemies.

04.209 Research on plant diseases and insects are fairly advanced at the National Institute of Agricultural Research; research is especially advanced on rice and is assisted by the Netherlands and Japan. Based upon the research results, the seeds of varieties resistant to insects and diseases are propagated and distributed under the intensification programs. Yet, the damage by rice hopper on rice is still common and recurring in the Province, and an abnormally large outbreak occured in the wet season of 1976.

04.210 In addition to diseases and insects, the rice-field rats (Rattus argentiventer) damage rice and other crops. Although there is no estimate of the degree of the damage, the rough estimate on the national level is about 10 percent of production including the damage to stored rice at the village level. Furthermore, the damage at BULOG warehouses is estimated as 5 percent. According to the Directorate General of Agriculture the rat damage by field rats in Central Java is said to be larger than the national average. The largest damage on record was in 1963; more than 800,000 hectares of paddy fields and 14,000 hectares of sugar cane throughout Java were affected. The damage

in affected areas were 40 percent of rice fields and 30 to 100 percent of sugar cane fields. In Central Java, the Kabupaten Wonosobo and its surrounding kabupatens are routinely damaged, and particularly high occurrence took place once every four years: the reason for this cycle is not known. The latest occurence was in 1973 and covered more than 7,000 hectares in Klaten alone.

04.211 Farmers use rodenticide which is made available through BIMAS or purchased from markets. However, the use of rodenticide is ineffective or at least uneconomical unless it is applied at the proper time and with use of proper methods. And for the proper use of rodenticide, basic information such as kinds of rats (sedentary or migrating), population dynamics, reproduction cycle, behavior and food preference, has to be known. However, in contrast to the advanced research on insects and diseases, basic information on the rat is severely lacking. With knowledge of these factors, rodenticide can be used more effectively and economically, or rats may be killed by other methods and at lower cost, such as organized batting practice by mobilizing villagers.

04.212 It is recommended, therefore, that a study on the methods of rat control be undertaken as a joint project of the Central and Provincial Governments. The location of the study may well be in the Kabupaten Wonosobo where the damage is extensive and recurring. Cooperation of international agencies and/or the countries where rat control has been carried out with success, may be necessary for this project.

4.4.4 Policy for Non-Rice Crops

(a) Palawija

02.213 The harvested area of palawija as a whole has been declining, due to the fact that an increase of double cropping of rice has been taking place at the expense of palawija. Even though efforts to increase the harvested area of palawija through more intensified use of tegal (dry land) and raising yield may succeed, the increase of palawija as a whole as targeted by the Provincial Government would be unlikely (see Section 4.3.2 (b) of this chapter). The policy for palawija should be more selective instead of efforts being dispersed to all palawija crops. Among the palawija, soybean will deserve more attention. At the Agricultural Development Center at Soropadan of Kabupaten Temanggung has proved, with the assistance of German experts, that a high-yielding variety introduced from Taiwan (Taichun variety) yields 20 quintals per hectare as against the kabupaten average of 4 quintals per hectare. In Thailand also two high-yielding varieties of better quality (high oil content and larger size of grain), one for wet season and the other for dry season, have been developed with the aid of technical assistance from Japan, which might well be tried in the Province. By expanding the planted area of soybeans in place of less valuable palawija, such as sweet potato, and also by raising yield, the production of

soybean may be increased to several times the present production. There will be no problem in respect to demand for this crop. In addition to increasing domestic demand, there exists a large potential for exports to Europe and Japan. Moreover, the development of the edible oil industry in the Province will increase the demand still more. The oil industry will more fully utilize the soybean as soybean cake, a by-product of oil production, is not only good feed for animal but can be used as the material of soybean-curd (Tahu) at lower cost than the whole-bean as is widely used in Japan. Attention should also be paid to increasing the yield of white maize in view of the people's preference for this type over yellow maize. Farmers seems to continue to grow white maize despite the fact that yellow maize yield are higher than those of white and government is encouraging the production of yellow maize.

04.214 Since the production of white maize accounts for a small portion of the total maize production of the country, the Central Government (National Institute of Agricultural Research) may not be much interested in varietal improvement, which has to be done at the Provincial level, perhaps at the above mentioned Agricultural Development Center at Soropadan.

04.215 To increase the yield of maize is very important for the agricultural development of the Province, in spite of the fact that the demand for maize will not increase much as mentioned earlier, because maize occupies the largest area among palawija. The area for maize can be reduced by increasing the yield, and the reduced portion of the land should be used for higher priority crops such as soybean (see Section 4.3.2 (b) of this chapter). The increase in yield of cassava which ranks second to maize in harvest area should also be raised for the same reason with maize.

04.216 It must be emphasized that, for increasing the production of palawija, the present crop-wise approach which takes up each crop individually has to be changed to multi-crop approach. Practically all farmers in the Province grow more than three crops; rice, various kinds of palawija and commercial crops. And these crops are grown on the same land in rotation and also by intercropping. Varieties of shorter maturity are popular among farmers despite the relatively lower yield of such varieties. Even the difference of one week in maturity period influences the succeeding crop. The selection of crops and varieties and the combination of the crops in rotation or intercropping has vital importance to farmers. Studies and guidance on the best combination of crops are essential for the development of agriculture production in the Province.

(b) Non-Food Crops

04.217 As stated earlier (see Section 4.1.4), the production of non-food crops is divided into two categories, i.e., small-holders and estates. The latter is further classified into that of state-owned

enterprises (PNP and PTP) and non-PTP which include both public, such as those owned by the Provincial Government, and private enterprises.

04.218 The production of rubber is predominantly by the state-owned estates. And since state-owned estates are entirely controlled by the Central Government, the Provincial Government has almost nothing to do with the production of rubber in the Province. The problem is the disparity in productivity between the PNP/PTP plantation and that of small-holders and relatively small private estates. Due to the lack of sufficient support from Central and Provincial Governments, the productivity of small-holders and private estates is very low. This low productivity is not merely the problem of the owners but the problem of the Province, because land which is very scarce in the Province should not be used inefficiently and uneconomically.

04.219 Sugar production is another crop which is mostly grown by state-owned estates, but the Provincial Government has great concern regarding it, because it competes with rice in the use of irrigated lowland (sawah). The national policy is not to increase the sugar cane area in sawah, and to increase the area in dry land (tegal). For this purpose, the Central Government has just opened a research station in Kabupaten Pekalongan as a branch of the Sugar Research Institute, to undertake research on dry land sugar cane.

04.220 If sugar cane is to be grown in dry land by farmers, instead of estates on rented land, as the Government intends to do, the study of cropping pattern in rotation with palawija has to be carefully studied. Such a study has to be included in the multi-cropping study as proposed in connection with palawija. Inclusion of other commercial crops notably tobacco and cotton in the study is also necessary.

4.4.5 Forestry Production, Land Conservation and Greening

04.221 Forestry plays two important roles in Central Java, i.e., the production of wood and the preservation of land and watersheds. The better utilization of forest resources in harmony with land conservation is very much needed for the Province.

04.222 Due to the large population of the Province, the demand for wood for fuel, building materials and other local uses is very high. Hence,not only low value woods but also valuable woods, especially teak, are locally consumed for fuel and other uneconomical uses. The high demand for wood for local consumption causes over-cutting of trees and bushes which have to be preserved for land and watershed conservation. On the other hand, conferous trees, which are valuable material for paper-pulp industry and also can possibly be exported, are not utilized except for tapping resin (see Section 4.1.7).

04.223 In order to release teak and other valuable wood for export and also to preserve forest resources for land conservation, some measures have to be devised to supply other sources of energy and construction materials. The use of teak for railway ties may be replaced by concrete blocks. The cessation of burning teak for railway locomotives should also be considered as a reason to change to diesel locomotives. Cooking energy sources, at least in cities, can be petroleum or natural gas instead of wood. Supply of cheap woods for domestic use from outer islands will be another way to make better use of valuable woods, but the present situation of inter-island transportation does not permit it.

04.224 The shortage of land vis-a-vis the strong demand for food has also led to the over-exploitation of hilly land for crop production. This takes place on privately owned lands but also by squatters in national forest land. Reforestation to remedy these situations within the national forest is carried out by the National Government and has proceeded fairly well, but the problem is still acute on private-owned land.

04.225 According to the national forestry authority (Directorate General of Forestry), at least 30 percent of the land area of Java should be covered by forest from the viewpoint of conservation. The present ratio of forest in Central Java is 20 percent as stated earlier. More than 300,000 hectares of land has to be converted to forest if 30 percent of the land is to be covered by forest, which seems to be almost impossible under the heavy population pressure in the Province.

04.226 However, it seems possible and necessary for conservation to re-allocate forest land. Much of the planted forest is not on steep slopes; some forests are on flat land which have no protective value, while the steep hill-sides on higher elevation is planted with cassava and other annual crops, which has the danger of causing erosion. Some arrangement may well be devised whereby the National Government acruires the hill-side area for reforestation in exchange for the state-owned forest on flat land.

04.227 To accelerate the reforestation on over-exploited areas combined with the production of fruit, forage crop and other useful products, the Greening Project is being carried out as a national program (INPRES).

04.228 The program consists of various measures for soil conservation, contour terracing for crop cultivation, planting trees on bare mountains and hills, making pasture, etc. As various agencies for forestry, agriculture, public works and livestocks are involved in this program, an inter-departmental coordinating organization is formed at the Provincial level. The villagers in the designated area for "greening" are provided by the Government with subsidies in the form of cash and saplings of trees. The labor for planting is mostly provided by villagers by means of "Gotong Royong" (traditional community mutual help arrangements).

The program was carried out on a total of 68,342 hectares in 1976 in the Province and the target for 1977 is 137,000 hectares. The program started from 1976 in some kabupatens and others are starting from 1977. In the kabupatens where the program has been started, the kinds of trees they have received from the Provincial Government were mainly Calliandra and Albizzia. It seemed that the selection of plants have been oriented more to reforestation than to production.

04.229 More varieties of plants should be made available so that villagers and local extension people can chose what they like to plant. Also, a study should be made on the suitability of various plants to different purposes, and introduction of new plants from abroad should be considered. Planting of mulberry trees combined with sericulture (silk cocoon raising) merits special attention.

04.230 Sericulture in Central Java is performed by PERHUTANI (State-owned forestry enterprise) in Pati, Wonogiri and Candiroto. PERHUTANI owns mulberry plantations in these places and has local farmers raise cocoons using the mulberry leaves of the plantation. In Pati, PERHUTANI has a silk factory which processes the cocoons into raw silk. Further development of sericulture in the Province, however, is restricted by the unavailability of land for mulberry plantation. Hence, the National Government (Directorate General of Forestry) has been endeavoring to develop sericulture in South Sulawesi where land is abundant and silk consumption is traditionally high. Technical cooperation by the Japanese Government is being provided for sericulture development there.

04.231 Since flat land in Central Java is already fully used for crop production, the possibility of developing sericulture in the Province would be only in highland areas, combined with the Greening Program. The cool climate of the highland areas is very advantageous for sericulture, because silkworms are less sucseptible to diseases. The labor intensiveness of silkworm raising is another factor which makes sericulture attractive for the Province. The branches of mulberry trees would ultimately be used for fuel for local consumption. In this connection, the recent development of sericulture in Afghanistan, known as a mountanous country, will serve as an useful example. There, mountain people planted mulberry trees since a long time ago for fruit (eaten either raw or sun-dried for preservation) and for fuel. In recent years the Afghanistan Government started a sericulture project utilizing these mulberry trees, with assistance from the Chinese Government (Mainland China), and now the country is exporting raw silk to Europe.

4.4.6 Agricultural Development for Handicapped Areas

04.232 As stated earlier, there are various problem areas in the Province. The lowland area east of Semarang often suffers from inundation during the wet season. As the transplanting method of rice culture is impossible in such a place, broadcast sowing is practiced, with lower

yield. The invasion of sea water is another problem hampering growing rice in the dry season. The solution to these problems in coastal lowlands mostly depends on public works of the Government, such as constructing drainage facilities, estuary dam, a water reservoir for supplying sufficient fresh water in the dry season, etc.

04.233 The so-called "minus areas" of the Province (see Section 1.2.3) are situated in Tertiary plateous and quaternary terrace as described in 4.1.2 (a). The main constraints in these areas are unavailability of water for paddy growing. The worst of the minus areas, as stated earlier, seems to be the limestone plateau in the southeastern part of the Province where the surface water seeps rapidly into deeper layers through the cracks in the limestone. The selection and introduction of crops tolerant to dry conditions is essential for the agricultural development of such an area.

04.234 At present, cassava is usually grown because of its tolerance to dry conditions. However, it takes longer to mature in dry land and yield is low, hence it is not a profitable crop. Among other palawija presently grown, sorghum is more drought-resistant than maize, but its palatability for human food is inferior to maize. At the same time, however, sorghum grain can be fed to livestock. The development of sorghum is not promising unless livestock industry develops in parallel. If this combined development of livestock is done, the intercropping of sorghum or cassava with a drought-resistant roughage crop would be a good farming system.

04.235 Trials should be made of various deep root plants which are likely to suit to the conditions of the minus areas. Several kinds of beans belonging to Phaseolus genus have deep roots, such as pigeon peas, black gram (P. mungo), green gram (P. aureus) and P. calcaratus.

04.236 Sunflower is another plant worth trying. The plant has highly efficient root system (the tap root reaches 3 m in depth) and can be grown in areas which are too dry for many other crops. Dwarf and early maturing varieties are more drought restant than ordinary tall varieties. In South Africa, dwarf sunflowers give reasonable yield of seeds even with 250 mm rainfall. Some early maturity varieties produce seeds in as little as 70 days, compared with 4-5 months required for ordinary tall varieties.

04.237 Sunflower seeds, containing 25 to 35 percent of oil content, are a valuable raw material for edible oil. The hulls which are removed before oil extraction and the cakes after oil is extracted are high-nutrient feed for animals. Sunflowers are also good honey plants with which bee-culture may well be combined.

4.4.7 Integrated Agricultural Development for Highland Areas

04.238 The area higher than 500 m in elevation accounts for 19.3 percent of the total land of Central Java; the area between 500 m and 1,000 m being 14.7 percent (see Figure 4.6). The highland area, though not suitable for tropical crops, is favored for growing temperate crops and livestock. The advantage of cooler temperature on highland, however, is not fully utilized due mostly to poor transportation facilities.

04.239 A pilot project for highland utilization may well be worked out in some area (or areas) to be selected within the area classified as Development Unit No.56 by the Land Capability Appraisal mentioned in Section 4.1.2 and shown in the attached map (Figure 4.4). According to the Appraisal the soil and climatic condition of the areas so classified are "very favorable for such plantation crops as tea and Arabica coffee and for vegetables normally adapted to temperate climate".

04.240 In addition to growing vegetables and fruits, the production of vegetable seeds for supply to lower areas mentioned in Section 4.3.2 (c) would be an important part of the project. Cooler temperature also favors animal husbandry (beef fattening, poultry, or dairy) and sericulture.

04.241 Road construction and marketing facilities should be an integral part of the project. Since this type of project involves various departments of the Provincial Government, a special organizational arrangement would be necessary both for planning and implementation: the ordinary arrangement of organizing a coordination committee would not be enough.

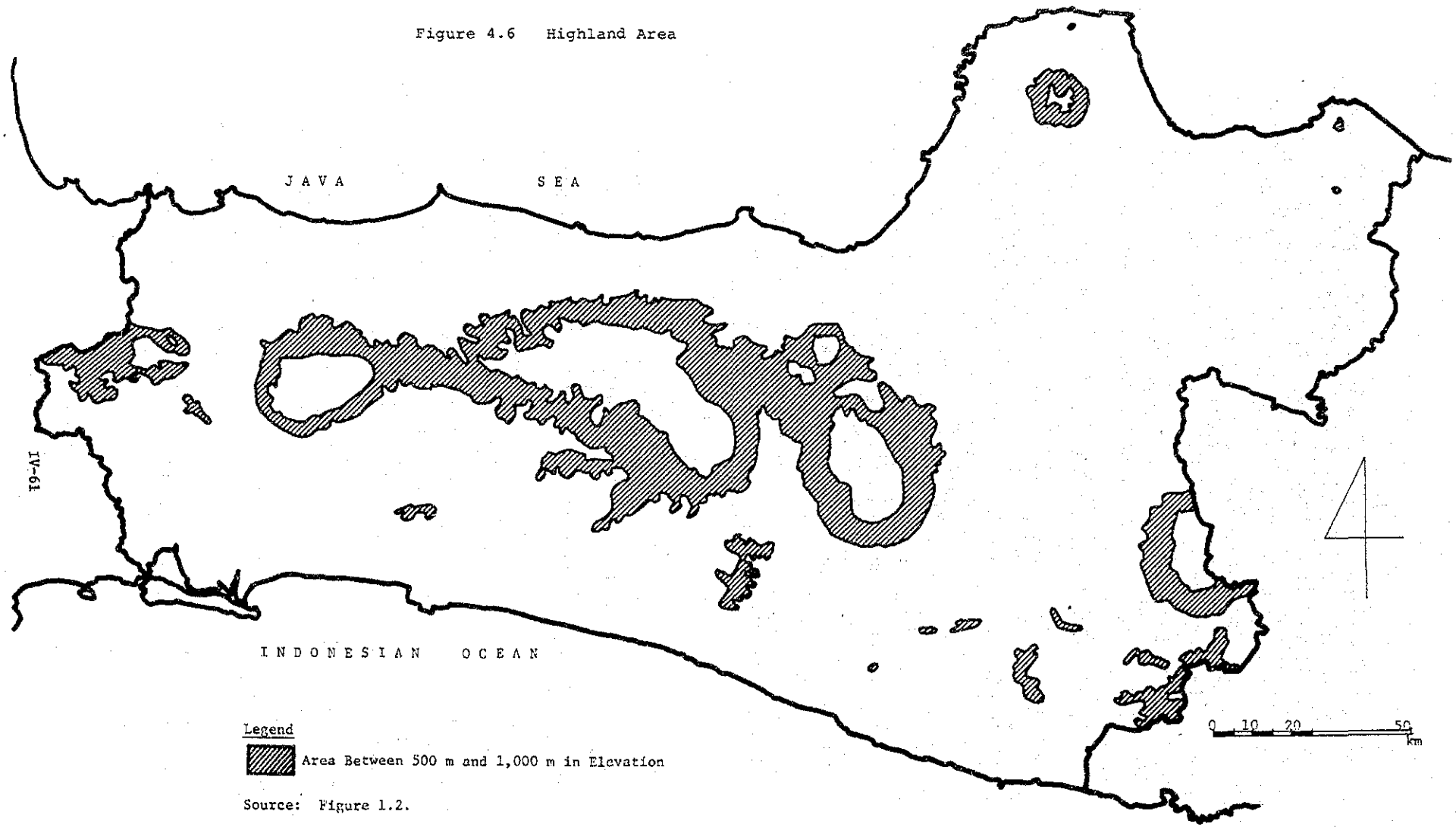
04.242 Studies on successful examples of highland development such as mentioned in Section 4.3.2 (c) may be useful for the project planning. Participation of foreign experts in the project would also be useful.

4.4.8 Strengthening of Regional Agricultural Research

04.243 To be effective, agricultural development programs have to suit the conditions of the areas where the programs are carried out. It has been repeatedly emphasized that for the maximum utilization of the limited land, selection of crops and varieties and their combination to best fit the respective regions is most important. Agricultural research from this viewpoint has been neglected in the past; researches are highly centralized in Bogor (National Institute of Agricultural Research) and few regionalized research centers exist.

04.244 The Provincial Government, being aware of this each of regionalized research center, is planning to establish Agricultural Development Centers (ADC) in the Province to perform applied research and trials and to provide technical information to farmers through extension service.

Figure 4.6 Highland Area



Legend

Area Between 500 m and 1,000 m in Elevation

Source: Figure 1.2.

The tentative plan conceived by the Provincial Department of Agriculture (Dians Pertanian Rakyat) calls for establishing 5 ADCs, one for each of 5 subdivisions (agricultural zones) of the Province. The proposed location of the ADCs are as follows (see, attached map Figure 4.5):

(1) Panarukan in KB Pemalang for the Northwest,

(2) Winong in KB Pati for the Northeast,

(3) Suropadan in KB Temanggung for the Central,

(4) Tajum in KB Banyumas for the Southwest, and

(5) Masaran in KB Sragen for the Southeast.

Already one ADC was established at Soropadan in Kabupaten Temanggung in 1972 and is operating with technical assistance from West Germany. The remaining ADCs are planned to be established within a few years. It is envisaged that each ADC be specialized in certain kinds of crops and/or certain fields of technology. The existing ADC at Soropadan is specialized in palawija, since the location of this ADC is the center of palawija production. And, as stated earlier (see Section 4.4.4 (a)), a high-yielding variety of soybean introduced from Taiwan was tested there with great success. Work on the selection of drought-resistant crops for "minus areas" (see 4.4.6) may well be assigned to the ADC to be established in Masaran. The ADC at Tajum should give special attention to the water-use techniques as follow-up to the Tajum irrigation project mentioned in Section 4.2.3. The main task of the ADC at Wineg would be multiple cropping with special attention to groundnut the production of which is highly concentrated in Kabupaten Jepara around Mt. Muria.

04.245 In view of the great need for applied research and trials on regional basis, the establishment of ADCs as planned would contribute a great deal to the agricultural development of the Province. Technical and/or capital assistance from international organizations and developed countries will be necessary and useful for the implementation of the plan.

4.4.9 Integrated Agricultural Development Planning

04.246 It appears that there is no integrated or well coordinated agricultural development planning in the Province. In fact there is the Rural Modernization Plan (Modernisasi Desa) which is mainly for the agricultural sector, but it is a collection of plans of various departments (Dinas - Dinas) of the Provincial Government. It also seems that the planning of each Dinas is worked out almost independently from other Dinases. Criteria for priorities in planning are vague, although such elements as income raising, equalization, export earning or import substitution are abstractively given as criteria.

04.247 As has been mentioned, the agricultural development programs should be more selective than they are at present both crop-wise and area-wise, if the programs are to be effective. For example, the rapid

expansion of egg production in recent years as mentioned earlier increased the supply of eggs to urban areas resulting in higher consumption of eggs, which is very desirable from the nutritional point of view, and also contributed to the employment. If, the same amount of Government efforts had been distributed thinly over the production of kampung (village) eggs based on consideration of the income distribution, the production effect would have been much smaller and taken longer to be achieved. The selectiveness is necessary but may some times be checked by the consideration of income equality. The income equality aspects should be taken into consideration from an over-all view rather than from individual program's view.

04.248 The need for integrated or well coordinated planning for agricultural development seems to be great. In some other provinces work has already started for making an integrated agricultural development plan under the guidance of the Ministry of Agriculture (Bureau of Agricultural Planning) and with foreign assistance. In South Sulawesi, as one such provinces, the work has just been started from January 1977 with the arrival of four Japanese experts; one attached to the Bureau of Planning of the Ministry in Jakarta and three in the province of South Sulawesi with the term of two years. In the case of South Sulawesi, experts are requested not only to help planning itself but with equal importance to train provincial and kabupaten officials in plan making.

CHAPTER V

AGRICULTURAL MARKETING AND RURAL ORGANIZATIONS

CHAPTER V

AGRICULTURAL MARKETING AND RURAL ORGANIZATIONS

5.1 General Characteristics and Present Situation

5.1.1 General

(a) Marketing

05.001 At present the scale of the market for agricultural products within the Province is not so large. In the case of rice, for example, the marketed rice is estimated on an average at some 30 percent of the total rice production in the Province. However, a marketable surplus will result from the on-going process of agricultural expansion.

05.002 Marketing of farm products, which consists of purchasing from numerous farmers in small quantities, storaging, processing and selling to either consumers or agro-industry enterprises, is performed chiefly by middlemen or merchants as well as cooperatives though on a small scale. These middlemen or merchants are largely non-indigenous nationals, mostly Chinese descendants, and the marketing networks are mainly managed by them.

05.003 Provision of credit to farmers at high rates of interest is often combined with the marketing activities of these middlemen so that small farmers forced to depend on such credit tend to fall into debt, and lose bargaining power.

05.004 On the other hand, a sizable volume of loans has been disbursed for trade activities in the rural area, although the amount of these loans were not so large as that for agricultural sector. However, the effect of these loans upon marketing activities is dubious. Thus, the problem lies in the efficiency of such loans rather than in the volume of loans itself.

05.005 With respect to the trade policy of the Government it is found that unjustified restraints exist on movements of goods.

It is evident that such restraints as excessive charges and duties (official and unofficial) levied on goods which are to be moved interfere with the transportation process and raise the price of the goods transported.

(b) BUUD/KUD and Other Rural Organizations

05.006 There are many rural organizations which undertake production, distribution or financing activities. Those organizations as related to production and financing include not only various cooperatives but also several financing institutions such as the village banks (Bank Desa), paddy banks (Lumbung Desa), Village Credit Bodies (Badan Kredit Desa), Sub-District Credit Bodies (Badan Kredit Kecamatan), the Regional Development Bank (Bank Pembangunan Daerah), and People's Bank (BRI: Bank Rakyat Indonesia). Historically cooperatives have been expected to play an important role in rural development, but mismanagement and politicalization in the late 1950s and 1960s have prevented the cooperatives from performing as had been espected.

05.007 In 1973, with the issuing of a President Instruction, the Central Government decided to officially establish the Village Unit (Unit Desa) by integrating a few former primary cooperatives into one village unit. The Government intended to implement the BIMAS program (improved BIMAS) through the Village Unit.

05.008 According to this Instruction, a fully established village unit is to have a farmers' cooperative (BUUD/KUD) for input supply and purchase of paddy, and/or village kiosks to distribute inputs, a BRI Unit Desa (Peoples' Bank's Credit Office) and at least one field extension worker (PPL).

05.009 The main activities BUUD/KUD now perform are provision of farm inputs such as fertilizer, insecticide and so on, and purchase of rice for sale to DOLOG (Regional Logistics Affairs Board), and Candak Kulak credit operations for small traders. However, credit operations up to now have been restricted to sale of some agricultural inputs and they yet do not have their own system for credit to the rural residents.

05.010 Furthermore, at the present time, BUUD/KUDs face a number of difficulties and restraints. The lack of experience and managerial and technical skills appears to be the most serious problem.

5.1.2 Characteristics and Present Situation of Marketing

05.011 The marketing system in Indonesia, at least for rice,

has been the subject of several recent detailed studies.[1/] Nevertheless, much of the economic activity of agricultural product marketing in Indonesia remains obscure. This is also the case in Central Java. There, we want to know actual marketing margins, the actual (official and unofficial) costs involved in marketing, the actual prices paid and received by farmers, and the production costs on different farms -- all important subjects.

05.012 Three factors make it very difficult to understand the marketing system: (1) a great portion of the commodities in Indonesia either does not move off farms or is not recorded if moved; (2) the Government has for decades cmployed an interventionist policy toward agricultural product prices especially for rice, but the actual extent of this influence has not been always clear; and (3) between the vague world of the "subsistence" farming and the government marketing institutions (of which BULOG, the Agency for State Logistics Affairs is only the latest of many), the marketing operations of a great numver of large and small merchants and others are not clearly defined or understood. Markets operate in every nook and corner of Indonesian life. Virtually everyone is involved to some extent in the market and both producers and consumers in Indonesia appear responsive to market forces. Despite all this, confidence in the marketing system is not widespread.

(a) Extent of Marketable Agricultural Product

05.013 Exports of the Province include many agricultural products but not very large quantities: rubber, tobacco, copra, coffee, kapok, cassava, and peanuts are all of some importance. Trade with other regions in Indonesia involves some outflow of sugar, rice and maize. Requirements of fertilizer and insecticide are met from outside the region.

05.014 Regarding consumption centers, within the region there are few large cities, none reaching a million inhabitants. Six municipalities are classed as "urban" and include 6.6 percent of the people in 1975, but the definition is very rigid as all the 29 kabupaten centers are substantial market towns. Population growth is about 1.4 percent per annum, but there is little evidence of urban "pull" from within the region: Magelang, Pekalongan, Tegal, and Solo are not growing; over the last 4 years (1971-75), Salatiga and Semarang has grown at 1.2 percent per annum, respectively (doubtless owing to the presence of the provincial administration).

05.015 The 1971 Population Census shows about 30 percent of the people in "rural" areas are primarilly engaged in activities other

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1/ The most relevant are IBRD, Rice Production Intensification Program Evaluation, 1972, Weitz-Hettlesater Engineers, Rice Storage, Handling and Marketing, 1972 and IBRD, Indonesia Agriculture Sector Survey, 1972.

than farming: 10.9 percent in commerce, 9.4 percent in manufacture. Of the men, probably 25 percent are not employed in agriculture at all. So it may be said that this proportion of rural families at least buy their food: 22 percent of male workers in the rural areas are non-family employees, but when working in agriculture, they get some, if not all, of their wages in kind. Within the "agricultural" sector itself, there will be included fishermen, foresters and some specialists in cash crops, who may also buy food regularly. It is difficult to put the market for producers of food crops at less than 30 percent of the people inside the region. Farmers will eat less rice per capita than other people and much more maize and cassava, so the marketable surplus of rice within the region probably exceeds 30 percent of total supply after inclusion of import and exclusion of movement.

05.016 Figures relating to the demand for non-food products in rural areas mostly come from the scarcity period of the year. The Sussenas Family Expenditure Survey of October 1969 to April 1970 showed that less than 25 percent of expenditures were made on non-food products in almost all income groups in Java. Traders' incomes will be low, like those of farmers' at that time. Most business is done after the main rice and tobacco harvests (mostly in April-May) and it is permissible to accept a figure of 35 - 40 percent for the year as a whole for non-food expenditures in rural areas. Cash costs of cultivation must also be met; but income from cash crops, sugar land, and extra earnings (mainly from women in trade and handicraft) will make up some of the gap.

(b) Classification of the Commerce Sector

05.017 According to the 1971 Population Census the size of the labor force in the trade sector in the Province was 1.010 million or 12.4 percent of the total economically active population. In rural areas about 11 percent of the total labor force is engaged in trade activities, but sizes of the trade activities are generally small. Trade between large cities and rural areas is carried out mainly by medium size traders and middlemen, (tengkulak). They are, in many cases, either non-indigenous nationals or their Indonesian agents. Moreover, there are, of cource, a multiplicity of small traders in the rural areas.

05.018 The total number of traders registered at the regional office of commerce was 20,414 in 1975 (Table 5.1). Those traders can be classified into four size groups: large, 614 or 11 percent; medium, 5,566 or 27 percent; small shop keepers or middlemen, 7,632 or 37 percent; the rest, being small traders. Actually there are many small traders having no license besides those mentioned above. It is noteworthy that about 60 percent of the total number of traders are non-indigenous nationals, mostly Chinese decendants.[2/] Most of

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2/ Annual Report 1975, Regional Office of Department of Commerce, Semarang p.48.

Indonesian-owned large and medium trading firms, of which Indonesian-owned large firms account for 31 percent of total large firms and the medium firms account for 31 percent of total medium firms, are government-managed enterprises.

Table 5.1 Number of Trading Firms, Foreign, Non-Indigenous National and Indigenous National (December 31, 1975)

Classification	Foreign		National (Non-Indigenous)		National (Indigenous)		Total
	Number	%	Number	%	Number	%	
1. Whole saler/ Shopkeeper I	5	1	420	68	189	31	614
2. Medium trader/ Shopkeeper II	649	11	3,260	58	1,657	31	5,566
3. Small trader/ Shopkeeper III	657	7	5,481	72	1,494	19	7,632
4. Retailer	462	7	3,572	54	2,568	39	6,602
Total	1,773	9	12,733	62	5,908	29	20,414

Source: Annual Report 1975, Regional Office of Department of Commerce, Central Java Province.

05.019 Semarang region has the largest number of traders, that is, about 30 percent of all and 70 percent of the large-size category, and is followed by Surakarta region (Table 5.2). Together, they account for nearly half of all licensed traders. The city of Semarang functions as the center for commercial activity in Central Java.

(c) Marketing and Financing

05.020 Marketing of farm products, which consists of purchasing from numerous farmers in small quantities, storaging, processing and selling to consumers or to agro-industry enterprises is performed chiefly by middlemen or merchants. Credit to farmers, at high rates of interest, is often combined with the marketing activities of the middlemen.

Table 5.2 Registration of Trading Firms; Foreign, Non-Indigenous National and Indigenous National, by Region (December 31, 1975)

Group/Region	Foregin		National (non-indigen.)		National (indigen.)		Total
	Number	%	Number	%	Number	%	
I. Wholesaler/Shopkeeper I							
1. Semarang	4	1	286	68	130	31	420
2. Pati	-	-	5	71	2	29	7
3. Pekalongan	1	3	23	72	8	25	32
4. Banyumas	-	-	29	62	17	38	46
5. Magelang	-	-	29	85	5	15	34
6. Surakarta	-	-	48	64	27	36	75
Total	5	1	420	68	189	31	614
II. Medium Trader/Shopkeeper II							
1. Semarang	240	16	685	45	588	39	1,513
2. Pati	20	32	320	52	281	45	621
3. Pekalongan	114	18	372	58	159	24	645
4. Banyumas	98	27	216	37	115	36	429
5. Magelang	77	5	1,165	87	136	10	1,378
6. Surakarta	100	10	502	51	378	39	980
Total	649	11	3,260	58	1,657	31	5,566
III. Small Trader/Shopkeeper III							
1. Semarang	269	12	1,577	73	308	15	2,154
2. Pati	21	1	766	66	387	33	1,174
3. Pakalongan	141	13	878	80	82	7	1,101
4. Banyumas	49	6	907	86	88	8	1,044
5. Magelang	41	6	611	86	59	8	711
6. Surakarta	136	9	742	51	570	39	1,448
Total	657	9	5,481	72	1,494	19	7,632
IV. Retailer							
1. Semarang	222	13	887	54	545	33	1,654
2. Pati	-	-	446	49	470	51	916
3. Pekalongan	-	-	582	77	171	23	753
4. Banyumas	129	8	1,098	70	336	22	1,563
5. Magelang	6	2	241	75	76	23	323
6. Surakarta	105	8	318	23	970	69	1,393
Total	462	7	3,572	54	2,568	39	6,602
The Grand Total	1,773	9	12,733	62	5,908	29	20,414

Source: Same as in Table 5.1.

05.021 A 1967 law prohibited private money-lending, but private money-lenders including village shopkeepers, traders, rice millers and hullers, and large village farmers still remain one of the largest sources of rural credit. The amounts of their loans are usually small but the interest rate is exceedingly high. Therefore there is a tendency for small farmers to become indebted to them and to lose bargaining power.

5.1.3 Rural Organizations as Related to Production and Financing

05.022 There are many rural organizations which undertake production, distribution, or financing activities. Historically cooperatives have been expected to play an important role in the promotion of rural development in Indonesia, but mismanagement and politicalization in the late of 1950s and 1960s have prevented them from fulfilling expectations. Inflation further compounded the problem. In 1967 the Government began a general effort to rejuvenate the cooperative movement by weeding out unsatisfactory cooperatives and establishing new and stronger ones.

05.023 During the Repelita I period, the basic policy of the government was to restore public confidence in cooperatives by strengthening their organization and management through training and extension services. Since 1970, cooperatives have been utilized in the framework of BIMAS programs. In 1973, by President Instruction No. 4, 1973 the Central Government formally established village units (unit-desa) through wihich the BIMAS (Improved BIMAS) program could be implemented.

(a) Village Unit

05.024 According to the regulation concerning the establishment of a village unit, one village unit is to cover 600 to 1,000 ha of irrigated rice fields and to comprise 3 to 4 villages with up to about 1,500 farm families. A fully established village unit is supposed to have a farmers' cooperative (BUUD/KUD) for input supply and purchase of paddy, and/or village kiosks to supply inputs, a BRI Unit Desa (Credit Office) and at least one field extension worker (PPL).

05.025 Village units are transitional organizations, whose roles are to be taken over by KUD after BUUD/KUD becomes full-fledged as a substitute for the village unit. Meanwhile, the roles of the village as an unit of administration remain as before. Development of BUUD/KUDs thus necessarily decreases the number of agricultural cooperatives, village cooperatives and other cooperatives angaged in rural activities. This means that small cooperatives will become both integrated and consolidated into BUUD/KUDs.

(b) BUUD/KUD

05.026 In Central Java there were 93 BUUDs and 437 KUDs, including one central KUD at provincial level and several fishery BUUD/KUDs, as of December 31, 1976. These BUUD/KUDs covered about 70 percent of the BIMAS/INMAS area (681,612 ha) in the wet season of 1975/1976 and 34 percent of the total paddy harvested area in the same period.

05.027 The main activities which BUUD/KUDs now perform are provision of farm inputs in forms of goods and services such as fertilizer, insecticide and so on, and purchase of rice for sale to BULOG (Agency for State Logistics Affairs) through DOLOG (Board of Regional Logistics Affairs). In addition, BUUD/KUDs undertake rice processing and seed production. Besides, their operation also involves credit service and, in some cases, agricultural extension service. For these activities, credit is provided to BUUD/KUDs by Bank Rakyat Indonesia (BRI) through BRI Unit Desa, extension services by the Ministry of Agriculture through PPL, and fertilizer by P.N. Pertani, Puari or local retailers through BUUD/KUD's kiosks (Figure 5.1).

(c) Other Rural Financing Institutions

05.028 Other rural organizations related to production and financing other than cooperatives include many financing institutions such as village banks (Bank Desa), paddy banks (Lumbung Desa), Village Credit Bodies (Badan Kredit Desa), Sub-District Credit Bodies (Badan Kredit Kecamatan), the Regional Development Bank (Bank Pembangunan Daerah), and Peoples' Bank (Bank Rekyat Indonesia) offices at the village or sub-district level.

05.029 Village banks were founded in 1965 and were originally village savings and loan institutions giving production credit to their members. Their operations are now confined to giving short-term (10 weeks) loans to small village traders and sometimes also 3 to 6 month loans to farmers. Village bank operations are supervised by BRI. Inflation has eroded most of their capital and their working funds now come mainly from BRI advances. There are 2,802 village banks in the province which means that statistically every 3 villages have one village bank.

05.030 Paddy banks deal with stalk paddy and function as depositories from which members may borrow seed or rice for consumption until the next crop harvest. Almost every village has a paddy bank but its role is declining probably because needs for rice in the preharvest months are decreasing as a result of introduction of new varieties.

05.031 The Regional Development Bank of Central Java operates in various sectors. This bank is mainly involved with the rural economy through extending soft loans to BKK (Sub-District Credit Body).

05.032 Peoples' Bank (BRI) is the oldest rural bank in Indonesia and was established in 1896. It was first called Bank Rakyat Indonesia

Figure 5.1 Structure and Function of Village Unit

[Provision] [Marketing, etc.]

PN. Pertani, etc. KIOS or WARUNG Farm Input Provision Activities	DOLOG-----BULOG BUDD/KUD Product Disposal, Processing, Storage, Collection
Dissemination of Technical Knowledge PPL Regional Extension Center--- Ministry of Agriculture	Credit Operations BRI Unit Desa BRI Branch Office--- BRI(**Central** Office)

[Extension Service] [Financing]

Source: Study team.

after independence in 1945 and was later integrated with other state banks into a single state bank in 1965. After the restructuring of the banking system in 1968, it was assigned the task of promoting economic development and welfare of the rural sector, particularly by assisting the Central Government with its agricultural development policies and programs. In extending rural credits, BRI gives priority to small individual farmers, agricultural cooperatives (including BUUD/KUDs), fishermen, small traders, handicraftmen, rural industries and small-scale industries. Some of its business has also been in transport and tourism. In addition, BRI acts as banker and supervisor to village banks, paddy banks, and several other types of secondary banks. In the Province at present, 39 branch offices at the kabupaten level and about 700 BRI Unit Desa are operating under the BRI regional office at Semarang.

5.2 Assessment of Progress to Date

5.2.1 Marketing and Price

05.033 Since 1968 the Government has attempted to maintain a floor price to support farmers and a retail ceiling price for milled rice throughout the country. Rice price stability was achieved and maintained until 1971 with remarkably small transactions by BULOG (the logistics agency) in the domestic market. Success was at least partly related to the larger output of rice; the fact that a small portion (25 to 30 percent) of the total rice harvest was marketed; and the continued reliance of BULOG on rice imports. BULOG rice is mostly for payment as wages in kind to government and related employees and for deliveries to the military. It would appear that the amount of rice needed to stabilize price is relatively small. However from August 1972 on, except for 1974, rice price began to rise again sharply on account of a bad harvest caused by drought and crop diseases.

(a) Marketing of Rice

05.034 Within the Province total procurement of rice through the DOLOG of Central Java region was around 100 thousand tons in 1969/1970 to 1975/1976 with the exception of 153 thousand tons in 1974/75 (see Table 5.3). 90 percent of rice procured by the DOLOG has been milled rice. During 1972/73 to 1973/74, imports were the major source of procurement by the DOLOG. On the other hand, domestic purchases in 1974/75 and 1975/76 were more than the average over the 1969 to 1974 period, though they were extremely small compared to marketable surplus estimated to be some 30 percent of total milled rice production in the Province, which is reported to exceed 2 million tons.

05.035 DOLOG's rice releases into the market for the purpose of maintaining the retail price ceiling were also quite small, varying from 1.6 thousand tons in 1971/72 to 77.1 thousand in 1975/76. A considerable

Table 5.3 DOLOG Stock, Procurement, and Distribution of Rice, 1969/70-1975/76

(Unit: tons)

No.	Activities	1969/1970	1970/1971	1971/1972	1972/1973	1973/1974	1974/1975	1975/1976	Total
I.	Beginning Stock (End of March)	9,245.20	18,109.60	29,498.50	18,533.10	11,573.50	39,399.40	91,827.30	218,186.60
II.	Procurement								
	1. Domestic Purchases	66,858.30	87,751.10	52,607.30	8,056.40	38,770.30	112,638.80	89,282.20	455,964.40
	2. Imports	29,542.40	15,336.80	3,488.10	78,290.90	67,290.90	40,857.70	20,809.90	255,017.50
	3. Movement	-	-	11,985.50	12,537.90	-	-	-	24,523.40
	Total	105,645.90	121,197.50	97,579.40	117,418.30	117,835.50	192,095.90	201,919.40	953,691.90
III.	Distribution								
	1. Army	57,483.40	54,621.40	47,152.60	44,875.60	42,873.90	39,522.20	41,604.60	328,133.40
	2. National Public Service Personnel	483.80	15,140.60	-	-	-	-	-	15,624.40
	3. Local Public Service Employee	39.40	-	-	-	-	-	-	39.40
	4. Government-Managed Enterprise	2,957.60	-	5,191.50	259.30	-	-	-	8,408.40
	5. Open Market	7,155.60	-	1,585.70	51,446.90	3,029.40	12,892.40	77,095.20	153,205.20
	6. Movement	17,500.00	21,081.20	23,238.70	5,649.20	28,683.50	16,388.60	31,587.90	144,129.10
	7. Others	1,916.50	855.80	1,877.80	3,614.10	3,849.30	31,465.40	22,772.20	66,188.90
	Total	87,536.30	91,699.00	79,046.30	105,844.80	78,436.10	100,268.60	172,897.70	715,728.80
IV.	Ending Stock	18,109.60	29,498.50	18,533.10	11,573.50	39,399.40	91,827.30	29,021.70	237,963.10

Source: Regional Logistics Affairs Board, Central Java.

portion of the rice procured by the DOLOG was used as partial wages in kind to the military and civil service personnel, but both the absolute volume and the relative share of rice distributed for this purpose has been decreasing, especially since 1974/75.

05.036 The DOLOG has now enough storage capacity for food, but of the DOLOG-owned 67 storehouses, only 10 percent is reportedly in good condition. Use of incomplete buildings for storage results in high rates of loss through vermin or rodent damage and humidity. According to BULOG's estimate, the total rate of losses in the rice marketing process amounts to 25 percent, while the rate of loss at storage level is estimated to be 5 percent. The rehabilitation of DOLOG's storehouses is urgently needed.

(b) Marketing of Second Crop

05.037 The marketing of second crops (palawija), has not been systematically dealt with in the current programs of BUUD/KUD's, though the BIMAS program was recently expanded to include palawija such as maize, sorghum, soybeans, peanuts and cassava. As a result, already less privileged areas based on palawija will further be left behind unless the marketing side of the problem is also supported by public policies.

(c) The Price of Main Commodities

05.038 The fixing of rice prices at the farm gate and retail levels seems to have significant implications on production and consumption of not only rice but other crops as well, though there appears to have been a considerable upword movement in most farm product prices relative to that of rice during 1969-71.

05.039 Since 1972, however, the price of rice has steadily risen, keeping pace with other crops, while maize, peanuts, cassava, sweet potatoes, and livestock products have risen sharply in price relative to 1971 and relative to rice. Therefore the real price of rice in rural markets has fallen or maintained a certain level (Table 5.4).

05.040 Differences exist in the retail prices of main commodities between the cities and the rural area in the province (Table 5.5-5.7). The price of rice in cities is generally higher than that in the rural area. The average price of rice in seven cities--Semarang, Kudus, Tegal, Pekalongan, Cilacap, Magelang, and Klaten--for 1974-76, for example, was higher by 10.5 percent than that in the corresponding rural areas to each city. Furthermore, during the same period, the average price of rice in the city of Semarang was higher by 23.4 percent than that of the rural area in Kabupaten Cilacap.

05.041 On the other hand, the price of textiles in the cities is cheaper than that in rural area. The average price of textiles in the seven cities mentioned above was cheaper by 18 percent than that in the corresponding rural areas for 1974-76. In addition, the average

price of textiles in the city of Semarang was cheaper by 28.7 percent than that in the Cilacap rural area. But the differences in the price, both between cities and between cities and rural areas (see Table 5.8)--tends to be reduced for these three years, with seasonal changes and some exceptions. This would be the result of economic integration and transportation development within the Province.

Table 5.4 Index of Food Commodity Price, Rural Markets of Java and Madura, 1969-76

Commodity	1969	1970	1971	1972	1973	1974	1975	1976
Rice	100	118	113	138	212	224	270	345
Maize	100	97	102	136	178	240	307	379
Soybeans	100	99	111	123	192	247	317	339
Shelled Peanuts	100	114	118	150	210	326	348	389
Cassava	100	128	120	155	266	215	280	415
Sweet Potatoes	100	126	127	158	278	238	310	426
Ripe Coconuts	100	98	125	115	185	347	223	230
Oil Coconuts	100	103	111	102	179	318	209	191
Salt Briquette	100	110	94	106	105	149	266	285
Hens Eggs	100	115	120	131	172	249	296	311
Buffalo Meat	100	122	158	173	227	342	416	438
Salty Fish	100	104	117	121	140	222	244	264
General	100	114	116	138	210	251	283	345

Source: BPS (Central Bureau of Statistics), Economic Indicators, August 1976.

05.042 What is meant by this tendency is thas a rise in price in the rural area rather than price reduction in the rural area can be expected as a result of an increase of goods supply through the improvement of transportation. This is shown in the change of the price of rice in the rural area during last three years (Tables 5.5-5.7). According to these tables, the price of rice in the city of Semarang was increased by 44.5 percent during 1974-76, while that in the Cilacap rural area was increased by 91.2 percent during the same period. On the contrary, during 1974-76 the price of textiles in the city of Semarang remained at the same level, while that in the Cilacap rural area was reduced by 10.5 percent during the same period. This is nothing but the import of inflation from the cities to the rural area. While the change of retail price of rice in Jakarta for the last three years has almost the same direction as that of wholesale prices in Jakarta, no significant divergence between the two is to be seen with the exception of that in December 1975 (see Table 5.9 and 5.10).

Table 5.5 The Price of 5 Commodities, October 1974

		Rice (Rp/kg)	Eadible Oil (Rp/l)	Salt (Rp/kg)	Salty Fish (Rp/kg)	Textile (Rp/m)
Semarang	C[1]	107.50	275.00	24.17	227.50	196.67
	V[2]	81.00	402.50	19.17	230.00	250.00
Salatiga	C	97.50	300.00	20.00	225.00	200.00
	V	-	-	-	-	-
Kendal	C	-	-	-	-	-
	V	81.67	336.00	21.67	212.50	266.67
Pati	C	95.00	350.00	15.00	275.00	200.00
	V	83.33	334.80	8.17	290.00	200.00
Kudus	C	95.00	283.31	12.50	250.00	205.00
	V	82.50	311.00	15.00	275.00	237.50
Tegal	C	102.00	325.00	20.00	300.00	200.00
	V	79.83	348.60	20.00	283.33	236.67
Pekalongan	C	110.00	330.00	25.00	280.00	200.00
	V	81.67	340.70	23.33	276.67	215.00
Purwokerto	C	95.00	330.00	25.00	240.00	240.00
	V	-	-	-	-	-
Cilacap	C	100.00	300.00	25.00	-	200.00
	V	72.33	347.70	25.00	280.00	262.50
Magelang	C	100.00	290.00	25.00	240.00	220.00
	V	82.00	367.50	20.67	262.50	260.00
Purworejo	C	95.00	275.00	35.00	-	260.00
	V	77.33	350.00	18.33	325.00	245.00
Surakarta	C	97.83	333.33	20.00	210.00	203.33
	V	-	-	-	-	-
Klaten	C	95.00	300.00	25.00	210.00	200.00
	V	79.33	319.70	20.67	212.50	220.00
Wonogiri	C	92.50	310.00	25.00	250.00	200.00
	V	76.67	368.90	19.00	225.00	237.50

Notes: 1/ City
2/ Village

Source: Kantor Sensus & Statistik Propinsi Jawa Tengah, Economic Indicator, Central Java, Jan. 1975.

Table 5.6 Price of 5 Commodities, September 1975

		Rice (Rp/kg)	Eadible Oil (Rp/1)	Salt (Rp/kg)	Salty Fish (Rp/kg)	Textile (Rp/m)
Semarang	C[1]	124.67	181.33	28.33	286.67	190.00
	V[2]	124.17	196.00	43.33	275.00	260.00
Salatiga	C	124.00	225.00	32.00	235.00	223.00
	V	-	-	-	-	-
Kendal	C	115.00	248.00	76.00	251.00	250.00
	V	113.33	200.90	48.33	225.00	252.50
Pati	C	113.15	228.00	18.00	222.50	204.00
	V	123.33	200.66	19.00	287.50	225.00
Kudus	C	123.00	218.09	15.00	350.00	200.00
	V	118.33	207.20	38.33	300.00	260.00
Tegal	C	121.67	200.00	23.00	257.50	190.00
	V	111.67	219.80	38.33	286.67	223.33
Pekalongan	C	116.00	218.75	33.00	260.00	200.00
	V	115.00	200.20	46.67	300.00	237.50
Purwokerto	C	105.20	216.00	31.00	213.00	214.50
	V	-	-	-	-	-
Cilacap	C	105.00	220.62	35.00	194.00	209.00
	V	103.33	207.66	55.00	205.00	248.33
Magelang	C	120.00	220.50	29.75	240.00	210.00
	V	113.33	220.50	52.50	262.50	275.00
Purworejo	C	109.50	204.16	36.50	242.00	225.00
	V	111.67	210.00	47.50	200.00	220.00
Surakarta	C	125.17	183.33	30.00	206.67	203.33
	V	-	-	-	-	-
Klaten	C	121.00	200.00	35.00	270.00	200.00
	V	115.00	186.20	53.33	283.33	237.50
Wonogiri	C	111.00	208.33	31.00	224.00	220.00
	V	108.33	179.66	38.33	216.67	200.00

Notes: 1/ City
2/ Village

Source: Kantor Sinsus & Statistik Propinsi Jawa Tengah, Economic Indicator, Central Java, Oct. 1975.

Table 5.7 The Price of 5 Commodities, September 1976

Town		Rice (Rp/kg)	Eadible Oil (Rp/1)	Salt (Rp/kg)	Salty Fish (Rp/kg)	Textile (Rp/m)
Semarang	C[1/]	153.33	267.08	20.54	322.92	195.00
	V[2/]	144.17	257.25	26.67	278.33	245.00
Salatiga	C	153.75	273.75	18.75	225.00	250.00
	V	-	-	-	-	-
Kendal	C	152.75	283.50	46.25	347.50	258.75
	V	143.33	272.06	46.67	320.00	250.00
Pati	C	142.50	322.14	14.38	259.38	250.00
	V	130.00	245.46	13.75	260.00	275.00
Kudus	C	155.00	292.85	10.00	287.50	210.00
	V	140.00	241.26	25.00	400.00	225.00
Tegal	C	144.25	302.50	22.50	275.00	218.75
	V	136.67	247.80	41.07	316.67	255.00
Pekalongan	C	141.25	288.04	26.25	241.25	206.25
	V	141.67	261.34	40.00	300.00	240.00
Purwokerto	C	140.00	265.18	20.00	236.25	211.25
	V	-	-	-	-	-
Cilacap	C	146.88	296.25	35.00	275.00	230.00
	V	138.33	250.84	43.44	240.00	237.50
Magelang	C	150.88	312.50	25.56	224.38	229.38
	V	145.00	304.33	48.33	270.00	240.00
Purworejo	C	138.75	316.17	25.00	350.00	225.00
	V	141.67	280.00	37.50	350.00	260.00
Surakarta	C	152.92	214.17	20.00	214.17	177.09
	V	-	-	-	-	-
Klaten	C	163.75	287.50	20.00	300.00	230.00
	V	143.33	245.00	40.00	300.00	250.00
Wonogiri	C	145.00	287.50	27.50	262.50	275.00
	V	140.00	242.66	30.00	241.67	252.50

Notes: 1/ City
2/ Village

Source: Kantor Sensus & Statistik Propinsi Jawa Tengah, Economic Indicator, Central Java, Oct. 1976.

Table 5.8 Variation of Prices in Central Java, 1974-1976

	Item	1974	1975	1976
Mean Difference in Price Between Urban and Rural Areas with Kabupaten	Rice (Rp/kg)	19.7	2.1	8.7
	Textile (Rp/m)	-28.3	-31.0	-18.4
Coefficient of Price Variation Among Kabupatens within Central Java (%)	Rice in Urban Areas	5.8	5.8	5.3
	Rice in Rural Areas	3.2	5.2	2.4
	Textile in Urban Areas	8.2	8.8	4.9
	Textile in Rural Areas	8.9	5.6	10.9

Source: Tables 5.5 through 5.7

Table 5.9 Retail Prices of Rice (Medium Quality) in Selected Cities

(Unit: Rp/kg)

		Semarang	Surabaya	Yogyakarta	Jakarta
September	1974	86.54	82.84	72.53	73.13
December	1974	103.13	103.90	-	87.48
January	1975	103.61	105.06	89.39	89.98
April	1975	90.77	94.42	83.27	93.17
September	1975	114.73	123.28	104.00	104.95
December	1975	143.61	-	124.92	173.02
May	1976	125.71	127.59	116.23	106.75
August	1976	139.43	137.54	142.45	112.25

Source: BPS, Economic Indicator, Aug., 1976, Jakarta.

Table 5.10 Wholesale Price of Several Farm Crops in Jakarta

(Unit: Rp/100 kg)

	Rice	Maize	Soy bean	Green nuts	Peanuts	Cassava	Sweet Potatoes	Potatoes
1968 average	4,762	1,674	4,021	4,615	6,230	396	608	2,904
69	3,680	2,420	5,599	6,258	7,655	460	707	3,375
70	4,476	2,623	5,180	5,821	8,125	689	795	3,031
71	4,194	2,558	6,001	7,056	8,746	767	980	2,805
72	4,912	3,330	7,280	8,788	12,792	1,223	1,460	4,075
73	7,662	4,591	10,850	12,409	16,524	1,827	2,262	5,339
74	7,837	6,066	13,149	16,220	24,067	1,582	3,026	5,931
75	9,701	7,287	15,736	20,967	25,364	2,003	2,777	7,653
75 Aug.	9,735	7,664	16,190	21,937	24,607	2,400	3,500	8,276
76 Aug.	12,108	9,767	14,806	29,967	29,508	2,495	3,600	8,058

Source: BPS, Economic Indicator, Aug. 1976, Jakarta.

Table 5.11 Price Difference at Selected Cities From the Level of Semarang (%)

(Unit: Semarang=100 percent)

	Yogyakarta	Surabaya	Jakarta
Sep. 1974	-16	-4	-15
Dec. 1974		1	-15
Jan. 1975	-13	1	-13
Apr. 1975	- 8	4	3
Sep. 1975	- 9	7	- 9
Dec. 1975	-13		20
May 1976	- 8	1	-15
Aug. 1976	2	-1	-19

Source: Table 5.8

05.043 As for the inter-provincial price change, the price difference of Semarang from Yogyakarta and Surabaya has been reduced during 1974 to 1976, although the difference from Jakarta still remains the same (see Table 5.11). The former part suggests that inter-provincial economic integration is going on in Java Island, and the latter suggests that amoung these four cities Jakarta is more growing than the other in terms of economy.

5.2.2 Performance of BUUD/KUDs' Activities

05.044 The greater portion of Indonesian people lives in the rural areas, and engages in agriculture. Village Unit Executive Body (BUUD) and Village Unit Cooperative (KUD) are to be developed in the rural areas and work especially for the agricultural sector. Therefore the establishment of BUUD/KUDs have to be given greater attention in regard to the rural development.

(a) Organizational Performance

05.045 For these five years the number of BUUD/KUDs in the Province has increased from 131 in 1973 to 530 at the end of 1976 (Table 5.12). The increment in number for the latest three years is not so large, but the shift of legal status from BUUD to KUD, so-called amalgamation, appears to have been smoothly carried out in terms of numbers. At present, therefore, the number of BUUD is decreasing, and this trend should continue in the near future, since the establishment and development of BUUDs is closely tied to BIMAS Rice program, its geographical coverage has been limited largely to teehnically irrigated areas.

Table 5.12 Number of BUUD/KUD, 1972-76

Year	BUUD	KUD	Total
1972	129	2	131
1973	335	68	403
1974	206	282	488
1975	118	402	520
1976	93	437	530

Source: Regional Office of Cooperative, Central Java Province.

05.046 Out of 437 KUDs, only 4 KUDs are classified as active ones (the grade A), and 97 KUDs are looked upon as nearly dormant ones (the grade C). Lack of leadership is pointed out to be the main cause of the inert activity of such KUDs. Besides, indifference of rural residents to cooperatives or BUUD/KUDs and lack of information about BUUD/KUDs' activities aggravate the situation. Therefore at present the member of BUUD/KUDs accounts for more or less 10 percent of the total farm families.

(b) Performance of Marketing and Input Distribution

05.047 Since 1973 the Government has entrusted the BUUD/KUDs with the responsibility for purchasing, processing and marketing of rice. By establishing an organization that will always be prepared to buy the farmers' product at a fair price, it is hoped to overcome the problem of exploitation of the farmers by middlemen or money lenders.

05.048 Although the Government will buy rice also from other millers than the BUUD/KUDs, the BUUD/KUDs have a Rp. 0.50 price advantage over their competitors. The floor prices are fixed for different stages of processing. Since Dec. 18, 1976 the price for medium quality milled rice has been Rp.110.00 per kg (US$ 0.27).

05.049 In 1975/1976 434 BUUD/KUDs in the Province bought 68.7 thousand tons of rice for national stock, and sold it to the DOLOG (Regional Logistics Affairs Board) (see Table 5.13). During the same period the all BUUD/KUDs i.e. 529 BUUD/KUDs bought 31.1 thousand tons for resale on the local market. Nevertheless, the quantity of rice sold to the DOLOG or on the local market by BUUD/KUDs was only 5 percent of the total rice production in the Province during the same peroid. On the contrary, the DOLOG obtained 80-85 percent of total rice procurement through BUUD/KUDs. Judging from this, BUUD/KUDs perform almost all of the function of collecting rice, and make some contribution to lessening opportunity for farmers to be forced to take the low selling price of rice by millers or wholesalers.

05.050 On the other hand BUUD/KUDs have been appointed as local agents for distribution of subsidized fertilizers. The government is providing subsidized fertilizer in an attempt to increase food production. This program is combined with an intensification of extension services and sometimes also with production credit (BIMAS).

05.051 The program consists of production credit to farmers by BRI, and provision of seeds and fertilizer in a package at highly subsidized prices. As the National standard, the package (per ha) consists of 200 kg of urea and 75 kg of TSP (Triple Super Phosphate). The credit ranges to Rp.30,000 with monthly interest of 1 percent, payable in seven months or one month after harvest. These materials are distributed through BUUD/KUDs.

Table 5.13 Performance of Business Activities of BUUD/KUD

	1973	1974	1975	1976
Rice Purchased (tons)	1,916[1/]	121,277[1/]	103,086[1/]	34,450[1/]
Rice Sold to DOLOG (tons)	na	90,934[1/]	68,681[1/]	13,500[1/]
To Market (tons)	743	24,628[1/]	31,150[1/]	16,016[1/]
Fertilizer Sold (tons)	65,857	107,319	98,349	41,073
Insecticide etc. Sold (kg)	11,440	7,257	38,872	207,933
Ditto. (ℓ)	21,161	14,479	23,124	12,588
Fixed Deposit & Savings (Rp.)	na	23,329,707	56,700,070	66,952,448
BRI Borrowings (Rp.)	na	45,450,000	562,460,000	333,700,000
Reserves (Rp.)	na	6,684,028	15,101,062	19,225,529

Note: 1/ Crop year.

Source: Regional Office of Cooperative, Central Java Province

05.052 In 1975, BUUD/KUDs in the Province distributed more than 91 thousand tons of fertilizer or 74 percent of the total amount of fertilizer used in the BIMAS/INMAS program. Since the margin of operation for fertilizer distribution on the local level is Rp.2.5 kg, the BUUD/KUDs are developing their own secondary organizations to handle the wholesale distribution. During the same period BUUD/KUDs sold 208 thousand kg of solid insecticide and 12,588 liter of liquid rodenticide. BUUD/KUDs' farm input provision activities of this kind under the BIMAS program can be assessed to make it easier for the farmer, from the physical as well as financial points of view, to get those necessary inputs.

05.053 The processing and marketing activity also includes the operations of threshing, grading, drying, storage, milling and financing. Not all of BUUD/KUDs undertake processing because all do not have rice milling units. The number of BUUD/KUDs having a rice milling unit is steadily increasing, but presently only 35 percent of the number of BUUD/KUDs has the rice milling unit.

05.054 As a side line, BUUD/KUDs also provide processing, i.e., millling service for the farmers own rice for consumption or marketing purpose. In order to meet their main purpose, i.e., providing a marketing outlet for members' produce, it is sometimes necessary to limit the amount of milling service.

(c) Performance of Financial Operations

05.055 At the end of June 1976, total savings amounted to Rp.66,952,448 for the 377 KUDs reported in Central Java (Table 5.13). Of this total, Rp.37,437,122 or 56 percent was represented by initial savings, the only portion which properly can be identified as permanent capital since it must remain in the cooperative as long as the contributor is a member. Withdrawal of the balance of savings is subject to bylaws provisions of individual KUDs.

05.056 Total savings per KUD were Rp.177,593 but this average is not at all typical because the extent of activity depended upon the situation. From KUD to KUD, the amount of initial savings varied widely relative to total savings. Initial savings were less than 30 percent of total savings in one KUD, for example. In the other extreme, initial savings exceeded 80 percent of the total.

05.057 For the same 377 KUDs, the total of reserves and other funds amounted to Rp.19,225,529 at the end of June 1976. Of this total, 36.5 percent was reserves and also the balance had been allocated to various funds (for members dividends, Board of Members, employees and workers, education purposes, social purposes and for the community development in the operational area of the KUD). Thus, the average of total funds per KUD was only Rp.50,996 and reserves averaged only Rp.18,614.

05.058 From the above, it is apparent that many KUDs in the Province have very limited resources of their own from which credit could be extended to members. Data on 1976 loans and sales by the same 377 KUDs are not available. As reported, loans disbursed during the first 6 months of that year amounted to Rp.75,358,516 or an average of Rp.199,890 per KUD. Reported sales for the same period were Rp.1,471,761,289 or an average of Rp.3,903,875 with only 23 percent of the total to members.

(d) Organization and Education

05.059 KUDs, as any organization do, have their teething problems. It is necessary to develop a uniform approach in order to increase efficiency. To this end the Directorate General of Cooperatives embarked upon a scheme for creation of a model KUD. As a first step towards achieving the ultimate goal of KUDs the management of the pure business activities had to be improved. A program was designed to create 42 model KUDs that will serve as a demonstration KUDs to other cooperatives in their areas and also as testing ground for new approaches.

05.060 The whole project was supported and supervised by management consultants from Directorate General of Cooperatives. During the implementation period, each KUD was directly assisted by a management consultant. Once the initial implementation and testing was completed, those consultants from the Directorate General of Cooperatives assisted other KUDs in implementing the program.

05.061 A training program started in 1974 for the 42 Directorate General of Cooperatives consultants. They completed a 6 weeks intensive training program in the new systems, both at the Cooperative Training Centre (PUSDIKOP), Jakarta, and in the field. The implementation program for 42 model KUDs consists of: (1) 6 weeks training for 42 management consultants, (2) 6 weeks traning for 42 KUD managers, (3) training for Board of Directors and Supervisory Board members, (4) training for bookkeepers, (5) field testing of system, (6) revision of system, and (7) expansion of the project outside the original 42 KUDs. Intensive training program mentioned above in the Province resulted in success except for the item (7).

5.2.3 Rural Credit for Trade and Food-Processing

05.062 Credit to smaller traders, hullers, and rice millers comes from various sources, both governmental and private institutions, bank as well as non-bank institutions, and private money-lenders.

05.063 Institutional funds come mainly from Bank Rakyat Indonesia (BRI) and to a lesser extent from fertilizer distributors, tobacco and sugar estates, cooperatives, especially KUD, other local financing institutions such as Regional Development Bank (BPD), Sub-District Credit Bodies (BKK), Village Credit Bodies (BKD), and Village Banks (BD).

(a) Finance for the Trade Sector

05.064 It should be pointed out that a sizable volume of loans has been disbursed for trade activities in the rural area. Total outstanding loans of the BRI regional office of Central Java at the end of December 1976 amounted to Rp.33.5 billion, of which 13.1 percent is in fact loans to the trade sector. This share is small compared with 79.1 percent for agriculture, cattle and livestock and fisheries. Outstanding credit to the trade sector of Rp.4.4 billion includes loans to BUUD/KUDs for rice procurement of Rp.1.3 billion.

05.065 Food-processing channels are also short of credit for what may be called their trading activity rather than for their processing activity. Of the Rp.26.5 billion outstanding in agriculture, Rp.21.2 billion was the outstanding sum in BIMAS. The balance was the outstanding credit to some agricultural cooperatives, rice millers, small sugar cane farmers, small cotton farmers, clove small-holders, secondary crops and other farmers.

05.066 Besides, limited medium-term investment credits are provided by BRI for the improvement of rural infrastructure, including farm mechanization, rice processing and storage. And also small credit for investment and permanent working capital up to Rp.5 million (KIK and KMKP) has been extended since 1974.

05.067 Credit for investment purpose (KIK) covers a term of five years, whereas loans to finance working capital (KMKP) are given for the duration of three years. The rate of interest charged is 12 percent per annum for investment loans and 15 percent per annum for working capital loans. Above-mentioned loans outstanding as of December 31, 1976 was Rp.5.6 billion of which Rp.3.7 billion was for agriculture and Rp.1.5 billion for trade.

05.068 Apart from these, short-term "mini loans" are available for small traders, traders, handicraft workers and laborers. The success of BRI Unit Desa in handling their responsibilities for development is attributed to their deep penetration into Indonesia's rural areas. The personal approach by officials whom the villagers know has made possible amazing results. It is in this context that BRI Unit Desa are expected to play a bigger role in various development projects for the rural sector. Mini loans are one of these projects. These loans were launched in April 1974, for investment purposes or for working capital. The loans are extended by BRI village units in the amount of Rp.10,000 up to Rp.100,000 to individual borrowers for the duration of one year. The rate of interest charged is 12 percent per annum for loans for investment purposes and 15 percent for working capital loans. Although these loans are given mainly to help the poor and underprivileged rural population, common loan requirements, such as collateral, still exist. BIMAS borrowers are not eligible for mini loans, nor are other rural customers who already benefit from other types of BRI loan. The outstanding balance of mini loans as of December 31, 1976 was Rp.2.6 billion.

05.069 Regional Development Bank (BPD) also provides some financial resources for trade and other sectors. In 1975/76 total amount of loans the Bank disbursed was Rp.2.793 billion. Of that amount, Rp.1.010 billion or 36.2 percent was extended for the trade sector, Rp.0.37 billion or 13.2 percent was for the agricultural sector. But the loans granted by BPD with the exception of BKK credit, in general is inaccessible to small traders or small holders in the rural area because of the burden of a high interest rate and heavy collateral requirements. Although detailed data on the operation of BPD and BKK is not available, the total amount of credits given to the trade sector in 1975/76 through BKK was around Rp.330 million.

05.070 BUUD/KUDs obtains credit from BRI to purchase paddy and maize directly from farmers on a cash basis. These are then processed by BUUD/KUDs or millied in rice-milling plants. A credit ceiling of Rp.3.6 billion has been made available to carry out the rice procurement program 1976/77 and about Rp.2.4 billion out of this amount had been disbursed up to January 17, 1977 on behalf of 363 BUUD/KUDs. This loan is one of the trade sector loans from BRI.

05.071 Loans are also extended to the rice-milling units of BUUD/KUDs in addition to loans to purchase moisture testers, scales, and sprayers, and to construct drying floors and storages. Loans for the purchase of water-pumps are made available on a medium-term basis for three to five years. Outstanding loans to the rice-milling units totalled Rp.1.3 billion at the end of December 1976. These loans for investment purposes are guaranteed by LJKK (Guarantee Body for Credit to Cooperatives). Loans are also extended for purchase and maintenance of stock-seed and for purchasing increased production increments of secondary crops under the BIMAS program. Outstanding loans for this purpose were in the order of Rp.2.7 billion at the end of December 1976.

05.072 On the other hand credit BUUD/KUDs extend to the members has up to now been restricted to sale of some agricultural inputs. BUUD/KUDs have been assisting their members in obtaining credit under the BIMAS scheme, but they do not have yet their own system for credit service for the rural residents.

(b) Candak Kulak Credit Operation

05.073 There is, however, so-called Candak Kulak credit of which BUUD/KUDs are to take proceedings. This credit program was launched in November 1976 by the Central Government's strong support and has been implemented under the supervision of Directorate General of Cooperative. The main objective of this program is to stimulate small trader's commercial activities in the rural area and to develop channels for marketing and distribution of daily necessities. The Government has budgeted Rp.500 million in 1976/77 for this purpose and granted credit to small traders through BRI and BUUD/KUDs.

05.074 In the framework of this credit program BUUD/KUDs are in charge of applicant screening as well as credit disbursement. At present every BUUD/KUD is not permitted the operation of Candak Kulak credit. But some BUUD/KUDs which the authority concerned judged active and qualified are involved in this business. Each BUUD/KUD engaging in Candak Kulak credit obtains a credit fund of Rp.500,000 for this purpose. A credit limit is Rp.15,000 for 3 months per one case, and its terms of loan are the interest rate of one percent per month and the forced deposit of 4 percent of the credit amount to the BUUD/KUD.

05.075 This short-term credit is implemented smoothly and not only for BUUD/KUDs members but also for non-members, although detailed statistical data on the operation of Candak Kulak credit are not yet available. In a few kabupatens the number of KUDs is reported to have increased just after the introduction of Candak Kulak credit program. This credit scheme seems useful not only for small traders but also for publicity of BUUD/KUDs' activity.

5.3 Assessment of Ongoing Policies and Programs

5.3.1 Marketing and Trade

(a) Present Policy Implications

05.076 At present Indonesia appears to have not one but many more or less self-contained markets. Partly, this results from inadequate and expensive land and sea transport. Transportation bottlenecks are unquestionably a very real constraint to internal marketing, regional specialization and integration of the country and the economy. A major constraint is undoubtedly the absence of an efficient and inexpensive inter-island shipping industry which would transport both goods and people promptly, regularly and at low cost. Another factor appears to be that there is insufficient scope for the private sector to transport people and goods. Besides, to a lesser degree, it is a result of provincial control over the movement of goods and of the variety of official and unofficial levies on these movements.

05.077 According to informed circles, deficiencies of the transportation system especially in inter-island shipping, as well as of provincial control over the movement of goods gave an impetus to rising of rice price. Sustained output increases in agriculture in a number of regions cannot be expected to occur unless some of the most immediate causes for lack of integration of the agricultural market are effectively dealt with.

05.078 In Central Java, provincial levies on shipment of rice were abolished by Presidential Order, but in actuality still remain in effect. Furthermore, some restrictions on the movement of rubber, copra, coffee bean, and tobacco leaf are officially exist. Originally a regulation limiting trade in the basic commodities with other provinces was intended to prevent price increases within the province and to ensure maintenance of food stocks but, by restraining trade and due to smuggling and bribery which take place at check points, it causes unnecessary increases in price as well

as waste of time and energy. Unofficial levies and payments are so deeply rooted in the minds of the people that their eradication will not be easy. This problem has been often pointed out, but there is not much sign of change.

05.079 BULOG continues its deliveries of rice to the military. Most studies of Indonesia's rice marketing have concluded that BULOG should phase out its delivery of rice to military and government personnel. To the extent that BULOG phases out its deliveries to military and government personnel and to institutions, a larger domestic market demand would gradually be generated. The private trade will be capable of meeting this demand, particularly if price and credit policies are pari passu made more flexible.

05.080 Meanwhile, one way to improve the liquidity position of traders would be to increase the cash money supply, by increasing payments in cash to government personnel and military personnel instead of some of the payments in kind (especially during the harvest season).

(b) Policy Measures

05.081 As regards domestic trade policy the Government expresses the main objectives as follows[3/]: (1) to maintain the balance of demand and supply of goods; (2) to make the marketing of producers goods as well as consumer goods smooth; (3) to raise potentiality of the domestic marketing system and to utilize it; (4) to expand the market for raw materials and products domestically provided; and (5) to augment the role of the economically weak merchant group in the economic activity.

05.082 Specific measures taken with respect to marketing in 1975/76 were as follows: (1) national stock, for stabilizing the price, of rice and some important raw materials such as fertilizer, cement, iron, concrete, paper, asphalt and medical materials; (2) prohibition of export of raw leather; (3) construction and rehabilitation of warehouse especially for rice or unhusked rice; (4) standardization of 50 export commodities which was expected to facilitate grading of and transaction of the commodities concerned; and (5) opening of exhibitions at least once a year in various regions including the Province, which have begun to bring about sizable offers regarding such exhibited goods as textiles, sarong material, ready-made clothing, woven stuff, wood carving, household utensils, bamboo chairs and manufactured goods of leather.

05.083 In addition, the Government takes some steps to help the economically weak merchant group establish themselves. The most important ones involve credit, skill upgrading and market place construction.

3/ Presidential Speech, August 16, 1976.

05.084 The Government prepared the Candak Kulak credit program as already mentioned. This credit scheme introduced in November 1976 will be useful for economically weak small traders in the rural area in the short term, although it is too early to evaluate effects of that credit. But, at least, it would be optimistic to expect that Candak Kulak credit scheme makes it possible to produce a sort of entrepreneur in the rural area, because the borrower of Candak Kulak credit funds, in general, is engaged in trade in such a small scale that it is difficult to develop his entrepreneurship.

05.085 Besides, seminars for small traders were held in 9 provinces including Central Java, where they could acquire various skills in marketing, bookkeeping, management etc. and also receive consultancy service. At present, the effect of these seminars on improvement in the managerial skill of small traders is unknown.

05.086 Furthermore, the Government has a plan, "Market INPRES". This INPRES program has the objective of assisting the Regional Administration in obtaining soft loans from the bank to be used for the construction of new marketplaces or for the rehabilitation of existing ones in kotamadyas and kabupaten centers. These soft loans are for ten years with two years grace period. The funds from the Market INPRES are used to help the Regional Administration pay interest on the soft loans. With this program, it is expected that the small entrepreneurs with limited means will be arded, since they so far have not been able to find a place to open shops in the recently built "luxury" marketplaces because of the high rents there. In this instance, the market tax is to be reduced as low as possible so that the economically weak merchant group may be able to use those markets.

05.087 One of the other important policy measures is the preparation for the transfer of trade activities from foreign enterprises to national enterprises in accordance with existing regulations which involve a principle that the authority concerned does not issue new business licences to foreign enterprises. In this connection, the number of foreign enterprises is decreasing, but on the contrary, their share in total turnover appears to be increasing.

5.3.2. BUUD/KUD

05.088 Both the Provincial and Central Government are intent upon strengthening BUUD/KUDs so that KUDs can in the long run function as the main institutional machinery for rural development. For the time being, their efforts in strengthening BUUD/KUDs are focussing upon the following: (1) establishment of more BUUDs; (2) strenghening of the existing BUUD/KUDs' activities with special reference to processing operations, cooperatives' extension and dissemination of technical knowledge; (3) upgrading of BUUDs into KUDs which possess corporate status and can perform saving and credit operations for its members; and (4) education and training for cooperative cadres and personnel. The Ministry of Agriculture and the Directorate General of Cooperatives are mainly involved in guiding the development of BUUD/KUDs.

05.089 As regards education and training for cooperatives, there are various short training courses available in Jakarta and at the provincial levels. They consist of many courses such as (1) manager training course, (2) administrative course for setting up BUUD/KUDs, (3) rice-milling-unit mechanics course, (4) fertilizer and insecticide course for the personnel concerned, (5) cooperative education course for cadres and members, (6) training course for the personnel in charge of kiosks or warehouses, and (7) secretary training course for Candak Kulak. The period of those training courses ranges from 25 sessions of 75 minutes to 100 sessions of 90 minutes. In Central Java, in 1976/77 about 890 man-days were planed to be used for the various konds of training courses.

05.090 However, there are at present a number of difficulties and restraints for the development of BUUD/KUDs in Central Java, as well as in any province. Some of the major ones are summarized as follows. First, many of the existing BUUDs are facing difficulties in establishing a system of collaboration between the villages, and in integrating existing cooperatives into one KUD in the process of amalgamation. Second, many of the existing BUUD/KUDs suffer from lack of experience and of managerial and technical skills and also from activities done for private gain rather than that of the organization. Third, a shortage of trained government personnel in this field restricts the effectiveness of official guidance activities. Finally, lack of farmers' interest and confidence in the cooperative as well as scarcity of incentives to join the cooperatives prevent BUUD/KUDs from increasing their membership.

05.091 The first three problems may be resolved to some extent by the efforts now being made and to be made by the government authorities concerned. Besides, Central Java has a provincial level association of KUDs (PUSKUD) for exchange of information and mutual assistance, which is expected to alleviate the difficulties mentioned above. In addition, there is the Center for Cooperative Education (PUSDIKOP) in Semarang where some cooperative education and training courses above-mentioned can be held. The last problem, however, would call for a modification of the BUUD/KUD strengthening program of the Government, since it will have a bearing of strengthening BUUD/KUDs' own financing and marketing activities rather than taking over agricultural extension service now provided by PPL, in order to appeal to rural residents.

05.092 The modification should imply not only the financial reinforcement of BUUD/KUDs but also provision of special institutional measures for training and guidance for BUUD/KUDs so as to function as the financing and marketing agent.

05.093 With regard to the financial problem, as set forth in some detail earlier in this report, KUDs generally have extremely limited resources in the form of savings, reserves and other funds. Another difficulty faced, which is a quite understandable one, is that continuance of inflation from 1972 on has made members reluctant to

invest in their cooperatives. As a result, some KUDs have found it extremely difficult or impossible to collect membership dues (initial and obligatory savings) prescribed in their bylaws.

05.094 An unfavorable factor has been the apparent lack of full appreciation of the importance of building up the financial strength of the KUDs on a systematic basis, together with inadequate provisions in the 1967 Cooperative Law (No.12) and the bylaws to maintain this strength. In part, this lack of appreciation may be the result of emphasis of the Law and bylaws on the basic philosophy that cooperatives have a major obligation to contribute to the welfare of the community in which they operate as well as to the economic well-being of their members. For example, a cooperative report stated that its bylaws required periodic use of all accumulated reserves for a community project.

05.095 The official document[4/] on the establishment of KUD has the provision (Article 34-2), concerning allocation of net earnings, which requires KUDs to spend about 30 percent of net earnings for social and community development purposes. In this connection, there is an operational difficulty when there must be separate allocation of net earnings originating from activities related to members and from activities related to non-members. In some cases, it would require quite complicated accounting procedures to make the cost allocations necessary in arriving at justifiable division of earnings. Hence, in the interests of simplified record-keeping and accounting procedures, a single allocation of net earnings disregarding the separation between members and non-members is recommended.

05.096 If KUDs are to operate as an effective and dependable source of credit for their farmer members on any significant scale, it is of paramount importance that they operate on a sound financial basis, including the maintenance of adequate reserves. This is essential in order that they can withstand the more or less inevitable losses associated with extension of credit, and that they can supplement their own funds by borrowing from banks or other credit institutions. Under the present provision (Article 35-1) of the Cooperative Law, the accumulation and disposition of the reserve fund is left entirely to each individual KUD's decision, following its bylaw. However, the standard bylaws specify that not less than 25 percent of member earnings and not less than 40 percent of non-member earnings be allocated to reserves. These provisions are entirely inadequate for KUDs engaged in the extension of credit to members. And, for KUDs and for their members who need credit, the accumulation of adequate reserves is of vital importance. To this end, modifications of the present Cooperative Law or standard bylaws are necessary.

4/ AKTA PENDIRIAN.

05.097 Finally it must be pointed out the fact that the salary of KUD's employees including a manager is generally very low. This is part cause of the lack of full-time cooperative personnel. Improvement of the allowance system for the personnel would be desirable and, furthermore, an incentive system to them should be introduced.

5.4 Extension Services and Dharmatirta

5.4.1 Agricultural Extension Services

05.098 In implementing the policy for increasing agricultural production, so-called "Five Efforts" (Panca Usaha) has been promoted by the Central Government since the introduction of the BIMAS program. The Five Efforts consist of (1) utilization of artificial fertilizer, (2) utilization of pesticide and insecticide, (3) improvement in irrigation methods, (4) use of selected seeds of high quality, and (5) application of improved technology in cultivation.

05.099 During Repelita I the most important single objective, which is an increase of rice production, was to be achieved mainly through a major expansion of the existing schemes of the supply of current inputs and credit to farmers (BIMAS/INMAS). A good deal of progress was made in the rehabilitation and in the expansion of infrastructure, but, because of original poor state of the facilities and rapid expansion of the area which needs the services, the services remain generally insufficient to meet growing demands. That is the reason why the need for extension service responsible for all the Five Efforts mentioned above are increasing all the more.

05.100 The extension services operated by the five Directorates of the Ministry of Agriculture are semi-autonomous and consequently there are operational differences both within and between provinces. Until recently there was little coordination between the Directorates at the provincial and district levels. In 1974, the Central Government decided to reorganize the Ministry in order to intensify, streamline, and systematize extension services. Since then the situation has improved, with the appointment of Provincial Agricultural Coodinators.

05.101 Moreover the National Food Crops Extension Project to be financed by IBRD was launched to strengthen the existing provincial extension services for all food crops in 8 provinces (including Central Java) and Yogyakarta. With this project, the DGFCA (Directorate General for Food Crops Agriculture) extension services in the nine regions involved are expected to be modified and expanded, and additional extension workers would be recruited and trained.

05.102 The objectives of the IBRD project will be to provide farmers, on a regular, frequent and systematic basis, with up-to-date advice on farming practices which would have immediate impact on their yields. The project will deal with all food crops of small holders