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AGRICULTURAL SECTOR SURVEY

INDONESIA

(in four volumes)

VOLUME I

GENERAL REPORT

April 10, 1974

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CURRENCY EQUIVALENTS

US\$ 1.00 = Rp. 425

1 Rupiah = \$0.002

1,000 Rupiah = \$2.410

NOTE

The Agricultural Sector Survey report is based on data collected by a Bank mission to Indonesia in March 1972. Some of its major findings and conclusions have been overtaken by events. Therefore, this report is not intended to represent the Bank's current assessment of Indonesia's agricultural sector. Nevertheless, much of the technical data presented in the Annexes remains valid and it should be useful to the Government of Indonesia, IGGI members and to other countries, agencies and institutions interested in the development of Indonesia.

April 10, 1974

This report is based on the findings of a mission that visited Indonesia in February/March, 1972. The mission members were:

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INDONESIA

AGRICULTURAL SECTOR SURVEY

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INDONESIA

AGRICULTURAL SECTOR SURVEY

SUMMARY

- i. Agriculture accounts for half of Indonesia's GDP, provides two-thirds of the employment and about half of the nations exports.
- ii. Notwithstanding the drop in rice output in 1972, the trend in rice production, which represents about one-third of the value of agricultural output, has been up, with a growth rate of 3.4% over the 1951-71 period. More than half of this growth is attributable to acreage increases mostly in the Outer Islands and the rest to yield increases mostly on Java and Bali but also on the Outer Islands where newly developed land has been progressively converted to wet paddy (sawah) fields. Yield increases have become increasingly important in recent years as a result of various rice intensification programs under the first Repelita 1969-73. Other food crops have not fared as well partially because of the traditional preference for rice but also because of weak incentives and the lack of effective assistance in moving to improved varieties and methods. Estate production of crops such as rubber, oil palms, sugar, coffee, tea, etc. had been seriously neglected and acreage and yields had been declining. This has been offset to some extent by rapidly increasing smallholder acreage but yields have remained low. The net result has been a very slow growth in the output of perennial crops despite a substantial increase in acreage.
- iii. These have met with considerable success. Efforts of the Government during the first Repelita have focused primarily on increasing rice output and restoring productivity of the export sector. Major investments have been for rehabilitating irrigation systems and restoring efficient estate production and a major effort was made to provide fertilizer, pesticides and credit for rice production. The recent investments have not yet matured and can be expected to contribute to growth during the second Repelita (1974-78), and results of the rice intensification programs can be expected to spread. In addition further investments resulting from recently completed studies can be expected to increase output of traditional crops such as sugar, tea, rubber and oil palms and provide a basis for new areas of development such as cotton, livestock, and feed grains.
- iv. A great deal of the recent growth in output represents a recovery from the chaotic economic and social situation inherited by the present Government. The restoration of economic stability and normalization of markets combined with rehabilitation of transport and communication facilities explain a substantial part of this recovery. Further improvements from this source can be expected as recently financed projects and projects now under consideration are completed. However, the time has come to take stock of

the overall resource situation in the light of market possibilities, institutional capabilities and longer term development goals and to redirect the agricultural development program to achieve a better balance of land, people and capital as well as to sustain recent high rates of economic growth.

v. The resource picture is favorable. The wide variety of ecological conditions permit intensive production of most tropical, subtropical and even some temperate crops. Vast areas of undeveloped land resources exist on the Outer Islands and the potential for further intensification of production in the Central Core - Java and Bali - is still good. The vast forest, fisheries and livestock resources of the country leave considerable scope for more efficient and intensive exploitation.

vi. The large still unused agricultural resources offer a basis for a development pattern which has been followed by many countries. Their early phases of development were commonly based on exploitation of natural resources while basic physical infrastructure was built up, human capital was accumulated through educational improvements, and institutional infrastructure was established. Industrialization and other developments associated with it, such as population control followed such developments.

vii. The strategy outlined in this study calls for continuing emphasis and expansion of current efforts to intensify production in the Central Core but provides for a major new emphasis on the development of the Outer Islands.

viii. Currently about a quarter of the country's investment is in agriculture. In recent years private foreign investment in agriculture has primarily been in logging operations while public sector programs, including aided projects, emphasize the rehabilitation of rice irrigation systems and the Government estates. In the private sector a considerable part of the investment simply represented the labour of large numbers of small farmers who have been creating new farmland out of the swamps, forests and grasslands in the Outer Islands. Government assistance has been minimal and consisted of a small official transmigration program and access roads usually built for other purposes. Although appropriate pricing policies, provisions for credit and technical services are key requirements for the rapid development of the smallholder sector, larger transfer of investment funds directly to this sector, and increased development expenditures on rural infrastructure, will be essential if the rate of smallholder development is to be raised to an acceptable level.

ix. The basic issue for agricultural development concerns the balance to be established, between further investment in Java and Bali, with most of the population and infrastructure, and the Outer Islands with their very considerable unexploited land potential. Even allowing for large forest concessions, swamp lands and the regions such as Nusa Tenggara and Maluku where the main development possibilities are in extensive cattle ranching, it is conservatively estimated that there are 15 to 20 million hectares

with apparently good crop potential in Sumatra, Sulawesi and Kalimantan. In particular Southern Sumatra and the provinces of South Sulawesi and South-east Kalimantan appear to be areas in which the process of opening up new land and developing new farming systems should be expedited, with the emphasis on rainfed agriculture, perennial tree crops and livestock production rather than irrigation for wet rice production.

x. The realization of the great agricultural potential of such outer regions will, however, take time. Development is proceeding now on an ad hoc basis under transmigration schemes and more importantly spontaneously as new areas are opened up. Regional studies to identify development possibilities, and regional priorities have been initiated for a number of areas. The mechanisms for planning, preparing and implementing new projects are still weak and the re-orientation from the traditional approach to transmigration, (i.e. from the emphasis on moving people from depressed areas in Java and Bali to wet-rice schemes in other islands,) is at an early stage. Extensive field trials will be needed to establish the feasibility of new farming systems before major investments can be justified. However, there is considerable scope for land development and associated infrastructure based on traditional mixes of food crops and perennial tree crops in the Outer Islands.

xi. The main increases in agricultural production through the second plan period will probably have to come from existing small holdings, in Java as well as the outer islands. Smallholders in Indonesia are extremely hardworking and responsive to market forces. The recent expansion of clove production and the spontaneous tree crop development in West Sumatra and Lampung typify the initiative of established farmers as well as new settlers whenever opportunities and incentives exist. The recent increases in rice production resulting from the Government's rice intensification programs clearly show the Government's capacity to stimulate agricultural development. Similar combinations of pricing policies and agricultural services - credit, input supplies, marketing and extension services and processing facilities - for other small-scale producers including those in perennial tree crops, livestock and fisheries are being initiated by Government and can contribute to more rapid growth and better income distribution.

xii. The need for up-grading farming performance is dramatized by the fact that the average farm size has remained small, (only 1.1 ha for Indonesia as a whole and 0.6 ha for Java). The small average farm size in Java is obviously the result of the growing shortage of land. In the Outer Islands it is attributable to lack of infrastructure and capital and to farmers' inability to clear and manage bigger farm units without introducing more power and better technology. For the short and medium-term, the bottlenecks are the inadequate infrastructure and the lack of capital and supporting services in outlying areas. Over the longer term, expansion of farmers' absorptive capacity will be the key to further improved farm technology and to the expansion of the average farm size. This is consistent with experience from other countries under comparable circumstances.

xiii. The prospects for increasing efficiency, for opening up new lands and for shifting to higher value production, vary considerably among the different regions and for different crops but on balance the outlook is good. Various studies have pointed out specific opportunities with regard to rice intensification; rehabilitation of sugar; use of more fertilizer; improvement and expansion of irrigation; flood control and drainage facilities; improvement of estate and/or smallholder production of rubber, coconuts, tea, oil palms, establishment of cotton production and improvement of livestock, fisheries and forestry production.

xiv. In quantitative terms, the targets for the future imply an overall growth rate of the agricultural sector of 4.5% per year. This assumes a growth rate in rice output of about 4% per year and an average rate of about 5% per year for other crops, livestock, fisheries and forestry. Such a target is feasible but will be difficult to achieve. For most tree crops, livestock and forestry, the relatively long gestation period of investments means that most of the growth in output during the second plan period will arise out of investments made in the first plan or even earlier. Similarly, for irrigation, drainage and flood control projects, lags between investment and effective use of the facilities are substantial. However, the record of the past 20 years indicates that spontaneous development of new land has been at an average rate of 2.3% per year. Recent sharp increases in outlays for rehabilitation and expansion of transport facilities can be expected to accelerate this rate to some extent, particularly with regard to three centers of likely rapid growth -- Southern Sumatra, South Sulawesi and Southeastern Kalimantan. Hence, it would not be unrealistic to expect spontaneous land development to provide about a 2.5% per year growth. A further 2% growth can be achieved through various ongoing efforts for intensification and diversification to higher valued crops, largely in Java but including substantial areas in the Outer Islands where newly opened land is being converted into permanent tree crops and paddy fields.

xv. A growth rate of 4.5% per year for agriculture would imply a per capita income growth of about 2.6% per year, or roughly doubling of per capita farm income in the next 27 years if the trends of the past decade continue (i.e. about half of the increased population remains in agriculture)^{1/}. To achieve an average annual growth in total GNP of 7%, the growth rate outside of agriculture would have to be 9.5% which would imply a per capita growth rate of 6.3% or roughly doubling of per capita non-farm incomes in 11 years. However, such an increasing gap between farm and non-farm incomes would tend to accelerate the transfer of labor from agriculture to other sectors and thus raise real per capita incomes in agriculture somewhat above the levels assumed.

^{1/} Assuming a population increase of 2.4% per year over the Second Plan period.

xvi. A higher growth in agriculture could be achieved by accelerating the rate at which additional land, capital and technology are brought into agriculture. However, the 4.5% projected growth rate already assumes continuing high priority to government efforts to further intensify rice production and initiation of specific government programs to assist small order development in the outer islands. The possibilities for a higher growth rate will depend to a considerable extent on the incentive provided by government for such development and for initiation of uncles estate/ smallholder developments based on existing as well as new government and private estates.

xvii. Specific goals for agriculture in Java should continue to emphasize rice during the wet season but much greater stress should be placed on diversification in the dry season to achieve more effective use of water. Although every effort should be made to increase water supply, for dry season cropping, a shift away from rice to corn, oilseeds, pulses and sorghums, would permit more effective use of available water supplies. Specific programs for rehabilitating the sugar industry and establishing a viable cotton industry have already been identified and should be given priority, since the amounts of land involved are relatively small, need not significantly affect rice targets and would provide substantial savings of foreign exchange. Rehabilitation of smallholder rubber and coconuts also deserve high priority. In the forestry field there are a number of possibilities for establishing forest industries based on existing teak, conifer, and tropical hardwood resources; with current logging rates probably exceeding prudent forest management levels, there is an urgent need to initiate programs for afforestation and management, particularly of the main water catchment and denuded hilly areas. In the fisheries field, a major goal for Java should be to increase both marine and inland production through investments to exploit the resources of the Java sea and raise the productivity and acreage of brackish and fresh water fish ponds.

xviii. In the Outer Islands, major emphasis should be placed on upgrading the efficiency of smallholder estate crop production and accelerating the rate of new land development. Efforts to raise efficiency will involve developing a minimum package program geared to reach a large number of smallholders. Critical elements in such a package will include marketing, improved planting materials, and introduction of better techniques (e.g. spacing, tapping, fertilizer use, weed control) and processing centers. To accelerate the rate of new land development capital and management should be sought from all sources. In addition to a new and more vigorous transmigrati- on policy, every effort should be made to develop closer linkages between the smallholder and estate sectors in providing planting material, technical guidance and processing and marketing facilities. The private sector should be encouraged to undertake new investments and provide management services and processing and marketing functions not only for their own estates but for surrounding smallholders. PNP's and PT's should also be encouraged to expand their own operations as they become viable enterprises and begin to perform services for the smallholders. At the same time, efforts should

be made to improve the performance of spontaneous settlers who have been the major source of new land development during the past 20 years. Assistance should be provided in obtaining rights to land, credit to provide better tools and equipment as well as additional power (draft animals chain saws and some tractors), technical assistance in developing cropping patterns, - in short, many of the elements of the minimum package program for smallholders plus help in accelerating the land clearing/crop establishment process.

xix. The major new element suggested in this report is the proposal to step up new land development from the historical rate of 300,000 hectares per year with little government assistance to an average rate of over 500,000 ha over the second plan period. At the same time, we are suggesting an ambitious program for upgrading existing smallholders through the development of a "minimum package program". The proposed National Smallholder Development Organization would be expected to undertake from the outset part of the task and to gradually build up its capabilities for handling a growing program.

xx. Benefits of the new land development program would not fully materialize until the third plan period (1979-83). However, substantial benefits can be reaped quickly if the development can be closely linked to the exploitation of timber from the clearing process and if surplus crops grown on newly cleared land can be marketed efficiently. This in turn would provide substantial employment possibilities and relieve population pressures on the land in the older established areas.

xxi. Transport, marketing, and credit will be key constraints. Present efforts to improve and expand inter-island shipping must be greatly intensified and land links between the new development areas and the ports must be improved. Details of the minimum package program will have to be worked out and a number of specific studies must be initiated to select specific sites and prepare feasible projects to carry out this strategy.

xxii. In short, the strategy will involve continued efforts to intensify production on Java and other intensively developed areas through new and ongoing programs, rehabilitation and expansion of irrigation and drainage facilities, increased use of fertilizer and better planting materials, and improved marketing and processing facilities, plus major new emphasis on land development in the frontier areas in the outer islands.

INDONESIA

AGRICULTURAL SECTOR SURVEY

THE GENERAL REPORT

I. OVERVIEW

A. INTRODUCTION

1. This is the report of the Agricultural Sector Survey Mission which visited Indonesia during the period February 20 to March 25, 1972. The main purposes of the Mission were to review the recent performance of the agricultural sector in the light of longer term trends, Indonesia's natural resource endowments, market prospects and development goals, to identify constraints on agricultural development; and to suggest ways of accelerating growth of agricultural output and improving the incomes of rural people. The Sector Study is intended to provide a basis for discussion with the Indonesian Government aimed at evolving a broad strategy for rural development, a better appreciation of intra sectoral investment priorities, and a firmer basis for future Bank operations as well as contributing to the preparation of Indonesia's forthcoming development plan (1974-1978).

2. The work of the Mission was facilitated to a great extent by the availability of a number of major studies which had been recently completed on various aspects of agriculture. However, the lack of comprehensive national income data and the general inadequacy of data on production, trade, land use and land capability made it difficult to arrive at an accurate assessment of the situation. Nevertheless, a considerable effort was made to cross check all sources and to reconcile major inconsistencies in key areas such as rice, which accounts for one third of the gross output of the agricultural sector.

3. Almost a year has elapsed since the basic field work and analysis for this report were completed. A great deal has happened to the Indonesian economy and the world at large during this interval. While some attempt has been made to update tables and adjust findings in the light of the most recent developments, most of the text still reflects the situation as seen by the Mission in 1972.

4. To allow the reader to see the situation in the context of subsequent events, a brief summary of major developments affecting Indonesian agriculture during the past year is presented below.

Summary of Recent Developments

(i) The sharp rise in primary commodity prices beginning in the second half of 1972, particularly the increase in rice and other cereal prices, has had a considerable effect on agricultural production, trade and incomes. Combined with international monetary developments, involving major currency realignments, and strong inflationary pressures throughout the world, the relative price stability which characterized the Indonesian economy in early 1972 has given way to a period of rapid inflation.

Agriculture suffered a sharp setback during 1972 as a result of a severe drought but 1973 output appears to be back on trend.

(i.i) Although the prolonged dry season drought in 1972 and the rice crisis have been the focus of attention during the past year, agricultural production and incomes have subsequently recovered. The main wet season 1972/73 rice crop was planted late and continuing rains at harvest delayed market arrivals of new crop rice. Current prospects are that the crop was somewhat better than the record 1970/71 wet season rice crop and significantly better than the 1971/72 wet season crop. Continuing rains through the dry season can be expected to produce a record dry season rice crop (which normally produces about 30% of the year's supply). Completion of several irrigation rehabilitation projects plus good rains and favorable prices have combined to substantially raise rice production. For example, in the Rentang area and the Brantas Delta alone, dry season harvested area is expected to amount to about 80,000 ha as compared to the previous dry season area of about 25,000 ha because of more favorable weather and better price incentives. In addition to favorable weather, the sharp acceleration of BIMAS and INMAS programs have resulted in a significant increase in fertilizer use (a 20% increase of wet season 1972/73 over wet season 1971/72). Some flooding and disease problems have been reported but current expectations are that the 1973 crop (wet season 1972/73 and dry season 1973) will bring rice production back onto the upward trend (3.5% per year growth 1950-71) and in fact, may even approach the 4% level probably characteristic of the past five years. Compared with the 1971/72 wet season crop and the dry season 1972 crop, the total could be as much as 10% greater.

(iii) The dry season drought in 1972 also adversely affected production of other food crops such as maize, cassava, sweet potatoes and soybeans. To some extent, shortage of water for rice resulted in expanded planted acreage of other food crops but the prolonged drought reduced yields of most crops other than sugarcane.

(iv) The sharp increases in commodity prices which occurred beginning in the last half of 1972 helped stimulate additional output of a number of smallholder crops, particularly perennial crops such as rubber, and coffee in the outer islands where labor is scarce and intensity of tapping and harvesting depends to some extent on the relative returns from such activities as compared to other alternatives. High prices of these crops as well as rice, cassava and maize have also apparently drawn a significant number of estate workers into the smallholder sector.

(v) Weather and world commodity prices have dominated the short-term fluctuations in Indonesia's agricultural output over the past year. The Government has done a remarkable job in attempting to dampen the adverse effects on the economy of these two factors. Despite the weak statistical basis for determining the current supply demand situation for rice and other major food crops, GOI responded to market indications of shortages and successfully arranged for a sharp increase in rice imports in a situation of rapidly rising prices and very limited supply availabilities.

Table A: ARRIVALS OF IMPORTED RICE
('000 metric tons)

Fiscal Year	
1969/70	796
1970/71	764
1971/72	524
1972/73	1,200
1973/74 (estimated)	1,400 - 1,600 /1

/1 Commitments total about 1,400,000 metric tons. Government is still trying to obtain additional quantities.

Table B: GOVERNMENT INJECTION OF RICE INTO MAJOR MARKETS
('000 metric tons)

April (1972)	31
May	29
June	23
July	19
August	24
September	42
October	55
November	72
December	110
January (1973)	142
February	134
March	<u>180</u>
Total 1972/73	<u>861</u>

(vi) Injections of rice into the major markets during the last half of 1972 and the early months of 1973 helped maintain domestic rice prices substantially below CIF import costs (see Table B).

(vii) In October 1972 Government raised the rice purchase price from Rp 36 per kg to Rp 40 per kg, equivalent to a rise in price for dry stalk paddy from Rp 13.20 to Rp 15 per kg. In March 1973 in order to stimulate domestic rice procurement, prices were raised further to Rp 45 per kg for rice (Rp 17.50 per kg for dry stalk paddy). On May 24, 1973 Government again raised the price to Rp 52.50 (Rp 21.20 for dry stalk paddy) for rice purchased through the BUUD's (Cooperatives based in 4 or 5 village units). Fixing of provincial quotas led to quotas for individual BUUD's and restrictions on inter provincial rice movements. However, the dangers of such restrictions and excessive pressures on farmers to deliver to BUUD's became apparent and the Government abandoned its quotas for domestic procurement and announced its intention to limit its domestic procurement to a

support operation purchasing only when rice prices fell below the official Government purchase price of Rp 52.50 per kg. It also recognized that the rice price could not be rolled back to Rp 50 per kg and the release price was gradually increased closer to the market prices. By July, Government had virtually stopped injecting rice into Jakarta and consumer prices for medium quality rice in Jakarta dropped from the June peak of Rp 120 per kg to Rp 100 in July, Rp 97.50 in August and Rp 91.25 at end of November.

(viii) With prospects of a good dry season crop, no substantial market injections should be necessary until December or January at the earliest. Currently programmed imports should be sufficient to take care of needs until the next harvest. However, given the uncertainties of weather and supply availabilities, Government is likely to continue its efforts to procure and maintain a sufficient reserve to take care of the contingency that the wet season 1973/74 crop could again be delayed in reaching market.

(ix) Aside from its policies on procurement and pricing of rice, Government has also faced a serious problem with regard to the procurement, distribution and pricing of fertilizer. With international fertilizer prices more than doubling during the past year, GOI has recently been faced with problems of delays and defaults on previously contracted imports. Deliveries for the 1973/74 planting season have fallen behind schedule due to these contract defaults and shipping shortages. The sharp rise in price of imported fertilizer has also caused a corresponding increase in subsidies required to maintain the Rp 26.60 per kg urea price to the farmer under the BIMAS program. As a result, Government announced in September 1973 an increase in the price of urea and TSP to the farmer to Rp 40 per kg effective with the wet season 1973/74. The worldwide shortage of urea and TSP will no doubt slow down the rate of increase in fertilizer use and affect yields for 1973/74. Fortunately the new PUSRI fertilizer plant will come on stream in the fall of 1974 and plans for a further plant to be completed in 1977 are being expedited. These should help ease the current shortage of nitrogenous fertilizers.

(x) In the meantime, the major constraint to increased fertilizer use will continue to be the availability of imported supplies. Already, during the past year, free market fertilizer prices were 30% to 50% above the subsidized BIMAS price indicating a strong unmet demand for fertilizer at the previous price of Rp 26.60 per kg for urea. Participants in the INMAS program have already been paying prices of Rp 35-40 per kg on the free market for their supplies.

(xi) Despite the gloomy fertilizer supply outlook, the overall food production outlook is more optimistic. Irrigation rehabilitation projects initiated by the Government during the first plan period have been making steady progress and completed works are beginning to show up in increased output. These benefits will continue through the second plan

period as farmers complete tertiaries and land levelling and adapt management practices to the improved water supply. Improvements in access roads and minor irrigation works under the INPRES program (rural works at the Kabupaten level) are also expected to make a significant contribution to production increases. The accelerated transmigration program and increased level of investments in the Outer Islands in infrastructure, mining, forestry and estates are also likely to accelerate the rate of new land development. Other promising sources of growth include the major sugar rehabilitation program recently financed by IDA and the ADB; the substantial possibilities for increasing smallholder estate and food crop production through the North Sumatra Smallholder project the Smallholder Tea project and closer integration of smallholder production with estate production as envisaged for several nucleus estate smallholder projects currently under preparation; a cotton project recently prepared with IDA financing; possibilities for substantial increase in cassava, maize and sorghum production as a phase in new land development either by intercropping with perennial crops or as an initial stage in developing mixed rainfed cropping systems.

(xii) The basic strategy for realizing these possibilities is still being worked out in connection with the second plan. Although the broad objectives of the plan have been spelled out in the resolutions of the MPR (Parliament) and in a series of speeches by the President, specific priorities and investment plans are not yet available and will no doubt have to be worked out on an annual basis as in the past.

(xiii) The forestry sector still presents serious problems. With the largest forest resources in Asia and wholesale granting of concessions, log exports have risen at a spectacular rate. Although most concessions provide for industrialization of the operation and for long-term sustained yield production, there has been very little investment other than for log extraction. The result is that current logging rates probably exceed prudent forest management levels and could completely deplete the forest resource over the next 10 or 20 years. There is an urgent need for reviewing current forestry policy and renegotiating existing forest concessions if this is to be avoided.

(xiv) Exports of fisheries products continued to increase sharply, rising from a level of US\$2 million in 1969 to US\$35 million in 1972. The major part of this increase comes from the export of frozen shrimp which increased from less than US\$1 million in 1969 to US\$28 million in 1972. Export earnings in 1973 are expected to continue upward as a result of more than a 50% increase in shrimp prices and continued expansion of output. Exports of skipjack and tuna which have so far been relatively unimportant, are expected to rise sharply as the first three tuna long liners are now in operation and skipjack pole fishing is moving from experimental fishing to a commercial basis. Exports of frozen frog legs, and frozen crabmeat are also expected to increase rapidly.

(xv) Thus, in November 1973, the agricultural sector of the Indonesian economy appears to have recovered from the setback in 1972 and prospects are that a period of solid growth lies ahead. Output in the second plan period which starts in April 1974 can be expected to benefit substantially from the large number of agricultural projects initiated during the first plan period and from an increasing pipeline of new projects in various stages of planning and implementation.

(xvi) The rapidly growing contribution of oil to GNP, exports, saving and investment presents the Government with the opportunity to substantially increase resources for planning and implementing a much higher level of developmental expenditure than was originally envisioned when the mission was in the field. If it so decides, GOI can gear the direction, scale and geographical distribution of such investments to accelerating agricultural development to benefit the large number of rural smallholders and achieve significant improvements in income distribution and productive employment.

Agriculture in the Economy

5. The state of the Indonesian economy in 1972 showed a remarkable change from the situation inherited by the present Government in 1966. The runaway inflation had been halted. Rehabilitation of production and infrastructure was well underway. Debt rescheduling had eased the intolerable burden on the balance of payments. Direct controls on production and distribution and foreign trade and exchange had been sharply reduced. The currency was freely convertible and a substantial inflow of foreign funds had been initiated. All these, together with the dedicated economic leadership of the Government, had brought about a rapid increase in Government revenues and made possible the beginnings of improvements in public services and investment operations, and created an environment in which prospects for further growth and development were good.

6. Within this picture, agriculture has played an important role. The impact of the 1972 drought notwithstanding, rice production trends are up; forestry production and exports have expanded rapidly; and output of rubber and other estate crops have managed to show some growth despite deterioration in export prices. Fish and shrimp exports have expanded rapidly in response to strong export demand and poultry output is beginning to respond to a rapidly increasing demand reflecting improvements in per capita income. However, progress has been uneven and the lot of the poorest farmers in crowded areas such as parts of Central and East Java has not been significantly improved.

7. Despite these achievements, agriculture has not been a leading growth sector. In recent years, it has managed to more or less keep pace with population and food requirements but its share of national output and exports appears to be declining due to the growing importance of mining (particularly petroleum), industry, power construction, transport and trade sectors. Yet agriculture still provides roughly half of the national product, two-thirds of the employment and about half of the nation's exports.

8. The performance of the agricultural sector during the first three years of the current plans is difficult to evaluate. At least part of the reported increase in rice output appears to have been statistical and except for 1972 there is no question that weather conditions have been favorable. The availability of fertilizer and new high-yielding varieties, together with special incentives provided under the rice intensification program, has had a significant impact, but does not account for output increases of the size reported. Only a small part of the investments for rehabilitation of irrigation has actually matured. Similarly, in the area of estate rehabilitation, sufficient time has not elapsed to see results. The growth to date, appears to be largely a recovery from the chaotic situation of 1965-66. Stabilization and the restoration of minimum levels of transport, supply, credit and marketing services have been important factors. At the same time, however, considerable progress has been made in financing a substantial number of projects which will ensure a continuation of growth into the Second Plan. Basic studies completed or initiated during the period can be expected to provide a growing pipeline of projects going into the next Plan. However, new directions will be needed and the strategy should look beyond the fertile paddy fields of Java and Bali and the estates of Sumatra to encompass the total agricultural resources of Indonesia and to achieve a better balance of people, land and capital. This will require a much closer integration of economic activities among the various regions as well as between the small farmer, the estates and other productive sectors.

The Present Pattern

9. With 3,000 islands stretched out for some 5,000 km along the equator, Indonesia has a wide variety of climates and soils. Mountainous terrain, extensive coastal swamp areas and intermediate zones provide the basis for a broad range of tropical, sub-tropical and even temperate crops. Historically, developments have taken the form of an intensive wet rice culture to supply food to support an increasing population and an estate agriculture based on export crops. External trade which started with the early spice trade moved to sugar, rubber, coffee, copra, tobacco and a variety of tropical export crops. Smallholder agricultural development has been largely concentrated in the heavily populated regions of Java, Bali, Madura, Lombok, and small pockets in Sumatra and Sulawesi and estate development in Northern Sumatra and Java.

10. Out of a total land area of 200 million ha about 60 million ha seem to be potentially suitable for agricultural development. Of this, potential, only 16 million ha are presently cultivated and 12 million ha are under forestry concessions. A further 12 million ha are classified as productive forest reserve leaving about 20 million ha of land available for near term agricultural development. Most of this is located in Southern Sumatra, South Eastern Kalimantan and Sulawesi.

11. Smallholder production accounts for practically all food production and a major part of the estate crop production. Although foreign estates totalled some 1.2 million ha and produced 60 percent of the exports before the Second World War the importance of estate production has declined

sharply in the post-war period. Area, yields and output of the estate sector have dropped substantially as a result of the depressed 1930's, World War II, the revolutionary post war years and the nationalization of estates. During this period, there has been a steady encroachment of smallholders onto abandoned or undeveloped estate lands, explaining in part the rapid rise in smallholder estate crop area as well as the rapid expansion of food crop output in traditional estate areas such as North Sumatra. Agricultural holdings are very small with 70 percent of the farms less than one hectare. Average farm size of 1.1 ha for Indonesia as a whole and 0.6 to 0.7 ha for Java-Madura and Bali are hardly sufficient to provide an adequate living for the farm family and make off farm employment a necessity for most farm families despite the highly intensive nature of the agriculture.

B. THE NATURAL RESOURCE BASE ^{1/}

12. The archipelago of Indonesia extends over 17° of latitude and 47° of longitude, and is entirely situated within the tropic zone. Inherent differences in climate, topography and soil composition, however, provide a diverse environment where a great variety of crops can be grown. Indonesia is well endowed in land resources, and abundant opportunities exist for more extensive or intensive use of the land. In addition, the areas around the country have a considerable fisheries potential which is not at present adequately exploited.

Climate

13. Monsoons are a dominant characteristic of the climate. Local differences are largely influenced by topographic features in relation to dominant wind directions and by the size of the larger islands. There is a progressive lessening of precipitation towards the southern and eastern parts of the Archipelago. The climate is drier in Java, Sulawesi, and the Nusa Tenggara Islands than in the larger islands of Sumatra and Kalimantan. Typical differences between drier and wetter areas (at sea level) can be illustrated by average rainfall for Padang, on the west coast of Sumatra of 4760 mm and Kupang in Timor to the East with 1460 mm.

Land Resources

14. For this discussion of agricultural land resource potentials, agricultural regions are considered in terms of island groupings that do not split administrative boundaries. The areas, populations, and population densities of the regions are summarized in Table I.

^{1/} See attached Maps (IBRD - 10032 and IBRD 10075) and Annex I.

Table I: AREA AND DEMOGRAPHIC DATA

	<u>Area</u> (sq. km.)	<u>Population 1970 (est.)</u> ('000)	<u>Population Density</u> (Persons/sq.km.)
Java, Madura and Bali	139,667	79,861	571
Sumatra	524,097	19,385	36
Kalimantan	550,203	5,051	9
Sulawesi	229,108	8,719	38
Nusa Tenggara and Maluku	<u>154,304</u>	<u>5,623</u>	<u>36</u>
Indonesia (with- out West Irian	1,597,379	118,639	74

The tremendous differences in population densities among the different regions are shown clearly in the table.

15. Topographic map cover, land use and soil surveys are at present grossly inadequate to permit a precise appraisal of existing resources. A useful indication of agricultural potential of the different regions is probably given by the proportion in each of the three main terrain groups, namely mountainous, almost flat or gently undulating to hilly, and swamp land. Each of these terrain groups is characterized by a wide variety of soil types, the full range of which is yet to be determined. On the basis of this information, estimates have been made of the area with agricultural potential in the different regions. (Table II.) The proportions of land falling within the three terrain/soil categories vary considerably among the main island regions. A large amount of land is in Group I (mountainous). Sulawesi is the most mountainous (69 percent), and Sumatra is at the other extreme (32 percent). For planning purposes, it would be unwise to assume that more than 10-15 percent of the aggregate mountainous area can be brought into sustained yield agriculture.

Table II
 Area by Region and Type of Terrain/Soil
 Terrain/Soil Groups
 (Million ha)

	Group I		Group II		Group III		Total		
	Area	Area	Area	Area	Area	Area	Area	Area	Area
	Total with Agri.	Potential	Presently Cultivated						
Java, Madura and Bali	5.3 (38%)	1.1	4.1 (29%)	3.2	4.6 (33%)	3.7	14.0 (100%)	8.0	8.4
Sumatra	16.4 (32%)	3.3	17.7 (34%)	14.2	17.9 (34%)	1.8	52.0 (100%)	19.3	5.6
Kalimantan	22.3 (41%)	2.2	14.0 (25%)	11.2	18.7 (34%)	3.7	55.0 (100%)	17.1	1.6
Sulawesi	15.8 (69%)	1.6	5.4 (23%)	4.3	1.8 (8%)	1.1	23.0 (100%)	7.0	1.2
Nusa Tenggara and Maluku	5.7 (36%)	0.6	8.8 (59%)	7.1	0.5 (3%)	0.2	15.0 (100%)	7.9	0.7
Indonesia (Excluding West Irian)	65.5 (41%)	8.8	49.3 (32%)	40.0	43.5 (27%)	10.5	159.0 (100%)	59.3	17.5

Source: Mission estimates.

Group I: Mountainous land, mainly lithosols and andosols.

Group II: Almost level or gently undulating to hilly land, mainly red-yellow podzolics, ferralsols, red-brown mediterranean soils and regosols.

Group III: Swampy lands, mainly organic soils and alluvials.

16. Swampy land covers a relatively small proportion of Sulawesi (8 percent) and of the Nusa Tenggara and Maluku island region (3 percent); while about a third of Sumatra, Kalimantan and Java fall into this category. A particularly significant feature of the soils in these swampy areas is the very high proportion of organic and acid sulphate soils in the largely undeveloped swamps of Sumatra and Kalimantan, as compared with the relative absence of these problem soils in Java. The land in Java, which for the most part has already been developed to agriculture, contains mostly alluvial and low humic gley soils. These pedological differences are suggestive of a very wide range of crop suitabilities and they give an inkling of the problems, some of which may be insoluble, inherent to the development of many of the swamp lands in the Outer Island. Without more accurate data concerning the patterns and qualities of these swamp soils, it is difficult to estimate accurately the areas which could be developed productively for agriculture, but the figure is unlikely to exceed 10 percent in Sumatra and 20 percent in Kalimantan.

17. The remaining terrain/soil group is intermediate land, described here as almost level or gently undulating to hilly, which covers slightly more than 30 percent of the country. It affords by far the greatest area for future agricultural development. The range of soils, which is probably greater than in either of the other two groups, includes a large number which are well suited to cultivation with a wide variety of tropical crops, and it is felt that for long-range planning purposes, 80 percent of the land in this category should be assumed to be suitable for agriculture on the basis of existing evidence.

18. A comparison of the estimates of area with agricultural potential and of the area presently cultivated gives an indication of the differences in potential among the various regions. In Java, cultivation has already proceeded beyond the ecologically suitable level, an estimate which is widely corroborated by the observed degradation of land in many parts of the islands. It is apparent that some land should be taken out of cultivation, in line with fundamental soil conservation principles.

19. In the Outer Islands, however, a vast unexploited land resource potential exists. The figures overstate the magnitude of the potential in two important respects. Firstly, a large land area of some 12 million ha is in forest concessions already given to lumber companies, mostly in Kalimantan. Secondly, the development opportunities in some of the regions, particularly Nusa Tenggara and Maluku, appear largely limited to extensive cattle ranching owing to the long dry season, shallow soils or steeply sloping lands. Even with these qualifications, however, it can be conservatively estimated that there are 15-20 million ha with good potential for agricultural development in the regions of Sumatra, Kalimantan and South Sulawesi.

Forest Resources

20. Indonesia's forest resources are the largest in Asia. About 120 million ha are classified as forest land, and rough estimates indicate the existence of 45 million ha of production forest, of which 24 million ha would be suitable for permanent forest exploitation, 18 million ha for conversion to agriculture, and 3 million ha are managed forests in Java not currently considered eligible for conversion to agriculture.

21. Both Java and the Outer Islands contain high export potential forests, teak and mixed tropical forests respectively. There are, in addition, large areas of conifers that can form the basis of important new industries particularly pulp and paper.

Fisheries Resources

22. Marine Resources. The evidence suggests that the seas surrounding Indonesia, while not as rich in marine resources as the North Pacific and North Atlantic Oceans, are better off than most other tropical areas. The total area of the seas around Indonesia is about 5.0 million sq. km. with estimated resources which could yield an annual catch of about 5.8 million tons of fish. The so-called Upwelling Area -- the prime fishery -- covers roughly 750,000 sq. km. with an estimated 4.2 million tons per year, or the bulk of the total resources. Compared to this potential, present production of marine fisheries is just over 800,000 tons.

23. As one would expect in a tropical fishery, as many as 200 varieties of fish are found in Indonesia's waters. The principal varieties being fished at present are sardine species, mackerel, tuna, jack mackerel, coral fish, sea bream, shark and ray species and crustacea. Many tuna species are migrating in the Maluku and Banda Sea in Indonesian waters, especially the wide upwelling areas; the Indian Ocean near Java Island is becoming famous worldwide as a spawning ground for south blue fin tuna. Shrimp resources with a high export potential also appear extremely attractive in the Java Sea.

24. Inland Resources. The total area of brackish and fresh waters, with which inland fisheries are concerned, is 9.4 million ha with a potential output of 1.4 million tons annually. The fish production is only about 430,000 tons per year or almost 400 kg per ha. Yields are somewhat higher than in Thailand, but well below yields reached on more intensive fish farms in Taiwan and the Philippines. Pollution from crop insecticides and industrial waste appears to be affecting output in some areas, particularly around Surabaya.

G. STRUCTURE OF THE AGRICULTURE SECTOR

25. Indonesia has a dual agricultural structure consisting of probably 15-18 million smallholders and just over one thousand large estates.

The smallholder sector

26. Smallholders dominate Indonesian agriculture in number of farms and farmers and, with the exception of palm oil, in the production of all subsistence and cash crops. Smallholder exports in 1971 were estimated at \$270 million, compared with an estimated \$183 million exported by the estate sector, despite the fact that exports are the major object of the estate sector.

27. In 1963, 12.3 million smallholders were farming 12.9 million ha whereas 1,120 estates had 1.6 million ha. Smallholder farms averaged 1.1 ha while estates averaged 1,420 ha. With about 18 million ha in farms now, the proportion of smallholders is presumably larger, and their average size smaller.

28. Smallholders are concentrated on Java-Madura, Bali and those portions of the outer islands which have lent themselves to close settlement. The primary role of the smallholder sector has been to provide the food supply of the smallholder's family, but it is evident that it has also produced a considerable surplus. On Java-Madura and Bali where population pressure is especially intense and irrigation most extensive, the efforts of smallholders are heavily concentrated on the production of food crops, especially rice and other field crops. In the outer islands, especially Sumatra and Sulawesi, more of the efforts of smallholders are devoted to export crops, especially rubber and coconuts.

Farm Size, Land Ownership and Tenure

29. Intense population pressure exists on Java-Madura and Bali - where roughly 80 to 85 million of the present 120 million Indonesians live. Good soils combined with extensive irrigation, have produced incredibly small but viable farm units averaging 0.6 to 0.7 ha. Average farm size of 1.1 ha for Indonesia as a whole and 0.6 to 0.7 ha for Java-Madura and Bali can be compared with almost 6 ha in Malaysia, 3.5 ha in the Philippines and Thailand, 2 to 3 ha in Laos and Cambodia, and 1.5 ha in the Republic of Vietnam. Population pressures on the land in Java, Madura and Bali are much greater than in the heavily populated areas of Central Luzon, the Delta of Vietnam, or the Central Plain of Thailand.

30. The sizes of farm holdings are not uniform in Indonesia, even in the most densely populated areas. A wide range of farm holdings can be found in most villages. In heavily populated areas, this range is from less than 0.1 ha to possibly 2 or 3 ha, whereas in less densely settled areas it may range from 0.5 ha to 10 or more.

31. The 1963 census indicated that of the 12.3 million smallholders, 7.8 million were "fully owned" farms, 3.6 million "partly owned," and less than 1 million "fully not owned." Of the farms reporting tenure relationships (4.4 million), 1.5 were "share croppers," and 1.2 million operated on "fixed cash" or "fixed produce" relationships. A variety of other arrangements made up the remainder, including "rent-free" use of village or

other lands. Widely varying views are expressed by Indonesian officials about the extent of share cropping but the data is quite inadequate for an accurate determination, and the condition is further complicated by an intricate set of rental arrangements in which landless and very small land holders rent land from larger land owners, who in turn rent from still larger land holders.

32. Roughly 80 percent of the smallholder farms were fragmented according to the 1963 census. Farms of 0.1 to 0.25 ha were on the average fragmented into 2.4 plots. The extent of fragmentation declines to about 1.7 plots for farms from 0.25 to 0.75 ha, but it rises for farms of larger size.

Part-time Farming

33. Small units, over-population, low productivity and seasonality make it inevitable that many "farmers" find off-farm employment. The Agro-Economic Survey of 11,000 farms in different provinces, the most accurate recent sample survey, indicated that 32 percent of the farmers in the survey had "off-farm" work. The extent of off-farm work varied from 72 percent of the surveyed farmers in one Kabupaten in West Sumatra to practically none in some areas of Bali and Sulawesi. Farms in the sample averaged slightly more than 1 ha and were thus relatively large farms by Javanese standards. Other studies have indicated a high degree of off-farm employment among the farms with less than half a hectare.

34. The extent to which this "off-farm" work is "non-farm" work is not clear, and in Indonesia it is difficult to draw a clear distinction between agricultural and service work. The concentration of people in many areas of Java and Bali is such that settlements extend for many miles. The marketing and distribution of goods, both agricultural and others, in the small quantities appropriate to such conditions involve a great proportion of all the people.

Village Structure

35. These farms, farm production, and a great part of the marketing and distribution services associated with these operate within and between traditional villages which involve a complex network of social, political and economic inter-relationships. Many of the traditional (Adat) relationships which govern interaction in these village units are not evident to the outsider, but that they strongly influence life in the village, including economic relationships is beyond doubt.

36. The dominant influence in the village is the village headman (Lurah) and the other village leaders. These officials are usually persons of relative wealth and this advantage is augmented by village lands granted to the Lurah and other leaders for their own use, and to support the village administration. Developing an effective program to stimulate smallholder production must either lean heavily upon those village leaders or provide viable substitute institutions.

Techniques

37. Production and marketing techniques within the smallholder sector are both primitive and complex. Farm skills at least for traditional crops, are highly developed. Evidence of a high level of ability in operating traditional irrigation systems and cultivating crops is visible everywhere. Land scarcity and labor abundance have left little land untended and resulted in extremely intensive farming practices. For the large number of very small farms little else than labor combined with a hoe is evident. Draft power, where it can be used or afforded is performed by cattle or buffalo. Only in a very few cases has machinery invaded the smallholder sector.

38. Despite the quality of agricultural work, traditional varieties are not, in many cases, capable of sizable yield increases, and access to new varieties, fertilizer and associated techniques in recent rice intensification programs produced a sharp increase in production and demonstrated how important these are to raising output of even the most well understood crop in Indonesia.

Smallholders on the Outer Islands

39. Smallholder agriculture outside of Java and Bali differs primarily in that it has generally larger amounts of land per farm, irrigation is less well developed, and greater emphasis is placed on non-food export crops. Productivity is low, however, and smallholders suffer from an absence of marketing and distribution services and institutions. As a result, their products are of low quality when they leave the farm, and their share of the total export value of these crops is correspondingly low.

The Estate Sector

40. Before World War II, the European-managed estate industry in Indonesia was the largest and most technically advanced in the world. Although they had only 8 percent of the cultivated land, they produced 60 percent of Indonesia's exports.

41. Depressed conditions in the 1930's, World War II and its aftermath, and the expulsion of foreign estate owners and managers - between 1957 and 1965 - crippled the estate industry, especially divesting it of its managerial and technically trained personnel.

42. Throughout the past four decades, smallholders settled on estate lands, physical facilities have deteriorated, the advanced techniques and planting material and cultivation research dwindled away, and finally, the skills to farm and manage the estates were lost.

43. These developments produced a massive decline in estate production. The area in estates declined from its peak of 3.4 million ha in 1927 to 2.4 million in 1937, and to 1.6 million ha by 1963. Compared with 1938, sugar

production in 1963 had fallen by 53 percent, tea 55 percent, coffee 52 percent, tobacco 86 percent, cocoa 64 percent and cinchona 78 percent. Only rubber production matched the pre-war level, due in part to the substantial increase in smallholder area and output.

44. These declines in area and production were accompanied by declining yields on estates and corresponding higher unit costs. Those costs are further aggravated, by heavy taxes, an unbalanced cost structure, and illegal levies.

45. Since 1968, a number of estate rehabilitation projects have been undertaken by IBRD and the Asian Development Bank, especially in palm oil and rubber. A major program for reestablishing the sugar industry, which is an estate industry relying upon special lease agreements with Javanese villages for the use of land, has been initiated under IDA and ADB financing. Between 1969 and 1971, however, the production results from these efforts were modest, which is not unexpected given the long gestation period of most of these programs.

46. Inadequate management and trained personnel remain a critical bottleneck to the improvement of these large and once highly productive enterprises. An organizational mechanism to link the state-owned and operated estates (PNP's) into effective production and processing groups is lacking. The key constraint continues to be a top heavy bureaucratic structure which results in excessive interference and abuse of authority in day-to-day management decisions. A comprehensive study of the management of PNP's has been recently completed and recommendations of the study are now being implemented by Government.

Interrelationships

47. Interrelationships between the estate and smallholder sector are weakly developed, for the most part they operate as two separate groups, with other private farms still another. Partly this is a function of the great disparity in size of farm operations between smallholders and estates. The links between the estates and the marketing and distribution system are direct, their combinations of labor, land and capital are different, and so are production techniques. Provision of these services which are an integral part of each estate would require separate institutions for the smallholders and/or closer links between estates and smallholders.

48. The positive effect on smallholders of interrelationships with larger farm units is illustrated by better yields and performance of smallholders near estates, the adoption of techniques developed on the Westenberg farm ^{1/} in North Sumatra by surrounding smallholders, and the adoption by

^{1/} A private experimental farm now administered by the Foundation for Indonesian Farming Development which has been successfully demonstrating improved farming methods and distributing selected planting material.

smallholders of the techniques used in the Mitsugoro pilot farms in Lampung. It is also evident in the willingness of smallholders to take advantage of marketing opportunities opened by these and other similar ventures.

49. Far more stress needs to be placed by Government and by assistance programs on activities which will link larger operations to the smallholder sector, and link economic activities in different parts of the country.

D. ORGANIZATION OF GOVERNMENT SERVICES

50. Despite the progress recently made toward elimination of the compartmentalization in government services for agriculture far more needs to be done. The incredibly poor quality of agricultural statistics, which is a far more serious handicap to sound economic planning and project identification than is generally admitted, results in part from half a dozen different agencies gathering or reporting statistics on the same crop. Six poor collections of data do not make one good one, and they involve a great squandering of resources.

51. Similar overlapping pervades the entire government administration and services provided to agriculture. A multiplicity of extension services results in such anomalies as one farmer being visited by six different extension agents, each with a different program while thousands of other farmers never see an agent.

52. This compartmentalization is matched by low quality of service due to lack of specialization or concentration on a given task, which in turn results from salaries too low to support a person with only one job. When an extension agent can earn more a month raising chickens in his backyard than he earns as an extension agent, his loyalties are elsewhere, although he might prefer to be an extension worker. When research scientists at Bogor neglect their trial plots because necessity requires they have additional jobs, there are fewer research scientists than appears on paper and the results of their work are poor.

53. The problem of the multiplicity of Government agencies concerned with agriculture and the large number of Ministries involved, is not unique in Indonesia. As in many developing countries, considerable efforts have been spent in developing various ad hoc inter-ministerial review and coordinating bodies. These have dealt with individual problems concerning specific projects, annual programming and budgeting and broader policy issues. With the Government now actively engaged in developing the Second Plan, emphasis is now turning to the development of mechanisms to bring grass roots ideas and experiences to bear on the direction and content of national planning.

54. The present difficulties within the Ministry of Agriculture arise in part from the historical power and independence of the Directorates-General each of which was formerly an independent ministry. Although the

Directorates-General are now under the Minister of Agriculture, there is no effective body to coordinate policies and programs on a broad sectoral basis. Individual Directorates-General report directly to the Minister and in practice appear to conduct negotiations on such matters as project implementation, annual budgets and planning directly with the Agricultural Bureau of BAPPENAS. In an effort to strengthen planning within the Ministry, the FAO has provided a team of experts to work with the Planning Unit under the Secretary General of Agriculture. After one year, individual members of the team of experts are now being assigned to specific Directorates-General in an attempt to generate the basic data needed for sectoral planning, which has so far been unavailable. In the meantime, the BAPPENAS Agricultural Bureau has started work on establishing sectoral targets based largely on macro-economic considerations.

55. A number of encouraging developments have been observed with reference to regional planning. Provincial governors have begun to establish small planning units; BAPPENAS has established an inter-ministerial steering committee to deal with regional planning studies; UNDP technical assistance is providing finance for a number of basic resource and land use capability surveys; a West German Government-aided regional study of West Sumatra is nearing completion; IDA funds under a Highway Development Credit are being used in conjunction with a West German research grant to conduct a regional study of the southern half of Sumatra; the Ministry of Transmigration and Cooperation is reorienting its activities with a view toward concentrating its program on several substantial and well-defined growth areas -- Southern Sumatra, South Sulawesi and the southeastern parts of Kalimantan; the Directorate General of Agraria of the Ministry of Home Affairs has initiated a project to develop land use maps for all of Indonesia.

56. There is obviously an urgent need and a good opportunity to take advantage of these various efforts so as to assure a coordinated program for the rapid development of several high potential areas. The large number of agencies already involved make it apparent that a strong agency with full-time, well-qualified staff should be planning and coordinating the various regional development efforts. In the case of Southern Sumatra, the region to be developed extends beyond an individual province and could not be handled at the provincial level. Even in South Sulawesi, although most of the agricultural development would probably lie within the province, mining developments would extend into East Sulawesi and require a regional rather than a provincial approach. In addition, of course, the substantial amount of financing and external technical assistance required make it essential to have active Central Government participation. It would therefore appear desirable that some form of independent regional planning organization be established to plan and implement the development of each of these major regions, which would be directly funded by the Central Government and have close links with both Provincial and Central Government Agencies.

Extension

57. In addition to the weak organization for planning and for regional development, the most serious problem has been the weak extension and research organization. As in the fields of planning and regional development compartmentalization has resulted in duplication and overlapping of staff functions at the same time that certain essential services are completely absent.

58. A clear-cut extension service as such does not exist. In practice, there are technical agricultural services supplied by the various Directorates within the Ministry of Agriculture, and these are collectively referred to as the "extension service." About 29,500 of the Ministry's staff are classified as technicians. The present allocation of technical staff among the various Directorates adversely affects the administration of the extension service and the performance of the technical staff in the field. Each Directorate-General has its own office down to the Kabupaten level. These are often scattered on opposite sides of the small town. Integrating these offices could result in substantial cost savings and permit some upgrading of services, possibilities of pooling available transport, administrative services and data collection, and reporting could enable extension staff to spend much more time on advising farmers.

59. A phased strategy formulated by Government to meet its training needs should go far to surmount these problems, provided it is pursued with tenacity and vigor. The first phase, covering up-grading of the Ministry's staff and the development of selected training institutions should make a major contribution. In particular, the National Office of Agricultural Education and Training promises to make a major impact on the rationalization of education and training. The IDA credit of \$6.3 million for this first phase will materially help with its financing, which has in the past been one of the major factors limiting improvement of education.

60. The second phase, covering measures to reorganize and integrate the extension service and to improve technical instruction at farm level, is of equal importance to the first. Implementation of this phase will be possible only after further study.

61. Major problems which the proposed second phase study will have to consider include the following:

- (a) ways and means of organizing a better integrated extension service within the Ministry;
- (b) means of increasing the contacts and impact of the technical staff at village level;
- (c) requirements for greater mobility of staff at middle levels;

- (d) the temporary need for expatriate reinforcement of higher and middle-level staff until the Ministry's in-service training program produces sufficient upgraded existing staff;
- (e) the provision of more funds for upgrading salaries and expanding staff, and less for buildings than is presently apportioned;
- (f) methods to ensure that the results of applied research reach village and farm levels;
- (g) the possible organization of more intensive and higher quality extension services in a limited number of selected districts to measure the impact of such improved services under alternative methods.

Research

62. Research suffers from a fragmented overstudy of its problems. In the past five years or so, there have been numerous studies of research on specific crops, but each study has suggested certain organizational and administrative structures for the particular research in question without regard to how such structures would fit into the overall organization of research. These studies have included the following:

- (a) Plantation Crop Research
- (b) National Fertilizer Study
- (c) Indonesian Sugar Study
- (d) Tea Research Recommendations
- (e) Sugar Research Recommendations
- (f) Coconut Research Recommendations
- (g) Rubber Breeding Recommendations
- (h) Oil Palm Breeding Recommendations
- (i) National Rice Study
- (j) National Cotton Study
- (k) Clove Study

There has also been a study on the "Organization, Systems and Requirements for Research in Agriculture and Related Industries" by a Joint Agricultural Research Survey Team which provides a framework for further development of the agricultural research system.

63. Each Directorate of the Ministry of Agriculture is responsible for the research institutes dealing with subjects within its responsibilities. Many of the problems of the extension services are paralleled in research, in particular, the lack of coordination between the Directorate-General, which leads to much duplication of work, overlap of objectives, waste of manpower and poor efficiency. Also, the low levels of training of staff is as much a handicap in research as it is in extension. A large proportion of research staff spends much time in meetings and conferences, and on Service functions and administrative procedures, leaving relatively little time for research.

64. Government has recently decided to carry out a major reorganization of agencies involved in agricultural research to bring all agricultural research institutions under a new organization in the Ministry of Agriculture. The new body will be headed by a presidential appointee with the rank equivalent to a Director General. This proposed change should make it possible to eliminate the substantial amount of overlapping, waste and inefficiency resulting from the past proliferation of agencies. Government is also planning a consolidation and rationalization of research budgets and staffs and has initiated a system for annual review of research priorities and funding. IDA is currently considering the financing of a project to help establish several regional centers for important groups of crops and to lend support to the Government's new research program.

E. TAXATION OF AGRICULTURE

65. There are four major types of levies on agricultural products or incomes: excise, land and export taxes, and cesses. They currently yield about Rp. 85 billion, or roughly 20 percent of total government tax revenues.

66. Excise Taxes are the largest revenue producers--about Rp. 40 billion--, and are heavily concentrated on tobacco and cigarettes, which account for about 90 percent of receipts. Sugar and other minor products account for the remainder.

67. Land taxes (the Iuran Pembangunan Daerah or IPEDA) currently yield about Rp. 12 billion, most of which accrues to the local governments for use in development projects. The tax is primarily collected by the lurah (village head), in cooperation with the Bupati (head of the Kabupaten) and the Central IPEDA office.

68. The IPEDA may be assessed at a maximum rate of 5 percent of the estimated net annual yield of the land. In the case of plantation crops, largely in the Outer Islands, the tax is usually assessed at a fixed amount per ha which currently ranges from Rp. 500-850/ha. By contrast, the tax for good quality irrigated rice land (sawah) in Java, may be as much as Rp. 5,000/ha.

69. Enforcement and collection of the IPEDA has been weak. Efforts are now underway to motivate local authorities to enforce collections to the level of targets mutually agreed with the Central Government. Central Government transfers to the Kabupaten level for local infrastructure and development works (the so-called INPRES program) have been set for 1972/73 at Rp. 100 per inhabitant, but additional amounts up to Rp. 20-25 per capita are available to Kabupatens exceeding their IPEDA targets. Furthermore, provinces may now apply at the beginning of the fiscal year for credits from the Central Government to be used for development purposes for up to 40 percent of the previous year's IPEDA collections.

70. Present IPEDA assessments are still quite low in the majority of cases, and studies are underway to set them at levels more closely corresponding to actual values. The tax records are kept at the Directorate of IPEDA on the basis of land owners rather than on the basis of plots of land. ^{1/} According to these, there are at present 20.7 million taxpayers (i.e. farmers) in Indonesia, of which 16.2 million in Java and 4.5 million in the Outer Islands. IPEDA collections in Java amount to about 80 percent of the total.

71. In the determination of the individual assessments as well as in actual collections, local authorities play a crucial role. This is particularly true at the village level, where the headman (Lurah) is closely involved in both operations. The costs of administration of the tax are covered by an allocation of 10 percent of the proceeds, distributed among the lurah (6 percent), the sub-district (2 percent) and the IPEDA Office (2 percent). The Kabupaten receives the balance for distribution among sub-districts and villages for development purposes.

72. The IPEDA is a broadly based levy, conceptually equivalent to a proportional tax on agricultural income. Provisions are made for reduction of tax liability in case of crop failure, according to a schedule worked out jointly by central and local authorities. It should be possible, once the structure and administration of the tax have been consolidated and strengthened, to introduce some measures, such as limited exemptions, which would result in some progressivity and improved equity of the tax. The IPEDA clearly represents an appropriate vehicle for capturing additional resources from the agricultural sectors with probably the least injurious effects on producer incentives.

73. Export taxes currently yield about Rp. 30 billion. They are presently levied at a uniform rate of 10 percent and accrue to the Central Government, replacing taxes on exports levied by the provinces until 1969-70. As compensation, the Central Government makes transfer payments to the provinces equal to 105 percent of their respective export tax receipts in 1969-70. The tax applies on prices determined by the Ministry of Trade (check prices), which are supposed to correspond to actual world market prices and are adjusted quarterly.

74. Since Indonesian exports do not play a dominant role in world markets, export taxes are clearly passed on down to producers and must consequently have an adverse effect on production incentives. In some cases, particularly when a considerable amount of processing of the raw farm product takes place prior to export, and when production is carried out by large numbers of smallholders facing inadequate marketing systems, the tax actually passed on to the producer may represent considerably more than 10 percent of the producer price. Moreover, since World prices of the main export crops tend to fluctuate sharply, use of a sliding scale of rates could help to ease the burden on producers and help maintain incentives.

^{1/} This Directorate falls under the Directorate-General of Finance of the Ministry of Finance.

75. Unlike the IPEDA, export taxes represent an inefficient means of collecting revenues, with pronounced disincentive effects on production. It would be desirable to greatly reduce or phase them out altogether as the IPEDA is made more effective.

76. Cesses are nominal taxes levied on 17 export commodities, yielding about Rp. 3-4 billion annually. It is a tax on marketed production rather than export, since it applies not only to exports but to domestic sales as well, particularly those subject to inter-insular shipments. In fact, duties on domestic use are in some cases (copra, coffee) double those on exports.

77. Cesses are collected and administered by a Cess Board in which the Ministries of Home Affairs, Agriculture, Trade, Finance, Industry, Transmigration and Cooperatives, as well as the Research Institutes and private exporters are represented. Receipts are distributed between the Central (15 percent) and the Provincial Cess Organizations (85 percent). Revenues accruing to the Central Organization are destined to finance administrative expenses, trade promotion, the Central Research station and international obligations and the formation of a special account. Provincial organizations are supposed to spend 10 percent of their revenues on running expenses, 45 percent on infrastructure works (roads, bridges, canals, etc.) and 45 percent on development of the taxed commodities themselves (local research, replanting campaigns, etc.).

78. Copra, rubber and coffee provided the bulk of cess collections. In August, 1971, the cess on rubber (Rp. 1/kg.) was abolished but reimposed at a rate of Rp 2 per kg in mid-1973, and those on copra and coffee exports halved. They are now Rp. 2.5/kg. for exports and Rp. 5/kg. for domestic consumption of copra, and Rp. 5/kg for export to quota markets, Rp. 3.25/kg. for export to non-quota markets, and Rp. 6.50/kg. for domestic consumption of coffee.

79. The rationale for creating a separate authority to engage in tax collection and revenue expenditure functions which duplicate those existing elsewhere is not entirely clear. Furthermore, the type of tax itself appears even less meritorious than the export taxes discussed earlier. There appears to be little justification for maintaining this kind of tax.

II. PRODUCTION PERFORMANCE AND TARGETS

A. RECENT PERFORMANCE

80. Compared with 1961-65, agricultural production was only 4 percent higher and food production 1 percent higher in 1967, although better performance was registered in 1966. Because of continued population growth at around 2 percent, per capita agricultural and food production was lower in 1967 than during 1961-65. Thus, during the early 1960's, agricultural production was barely able to hold its own with the growth of population,

and Indonesia fell progressively behind its neighboring Southeast Asian countries.

81. In 1968 this trend was dramatically altered upward due in large part to Government's programs to stabilize the economy and to intensify rice production. Agricultural output rose in 1968 14 percent above the 1961-65 average and by 1971 was preliminarily estimated to be 26 percent above that level. Per capita production was about 5 percent above the 1961-65 average in 1970 and 1971.

Rice

82. Because rice accounted for roughly half the value of agricultural production during the period, its average reported increase of 8 percent from 1968 to 1971 was the main factor pushing up production. Modest growth was also reported in sugarcane, rubber, palm oil and kernels, but the growth in rice had to offset declines or stagnation in other crops.

83. Revisions in rice statistics in 1970 partly inflate this growth, and they suggest an underestimation of rice production and consumption in earlier years. But this does not alter the fact that at least in the rice sector there have been significant improvements. Over the past 21 years (1951-71) rice output has grown at an annual rate of 3.4 percent per year. More than half of the growth in output has been due to area expansion (1.8 percent per year) with yield increases amounting to 1.6 percent per year. Over the past 10 years rice output has also increased at a rate of 3.4 percent per year but there has been a drop in the rate of area expansion (1.4 percent per year) and substantial acceleration in yield increases (2 percent per year). Since rice acreage in Java has not increased over the past 10 years all of the new rice land development has occurred outside of Java (100,000 ha per year). All of the growth in rice output in Java has been due to intensification and higher yields.

Other Field Crops

84. The abundance of rice has apparently resulted in a substitution of rice for both corn and cassava - the other staples - and they have both suffered declines in output with only modest price increases. The other food crops, however, especially livestock products, coconuts and oil, soybeans and peanuts, have experienced dramatic increases in prices in rural markets, indicating the failure of production to keep pace with demand. It is very likely a function of two things: (a) the concentration of resources and subsidized credit and fertilizer on rice; and (b) greater difficulties in expanding the output of these smallholder cash crops because of weak organization mechanisms, serious marketing bottlenecks in the smallholder sector, and the need for at least minimal assistance in moving to improved varieties and methods. Yet area expansion of field crops other than rice has amounted to 2.5 percent per year over the past 21 years, most of it presumably in the Outer Islands.

Tree Crops

85. The slow progress in most tree crops is to be expected. The gestation period for improved production methods is such that recovery from decades of neglect will take at least five to ten years. Some benefits are already materializing in estate rubber and palm oil, due partly to picking up slack in these sectors, associated with generally improved economic conditions and higher palm oil prices. A rapid increase in close plantings, stimulated by extremely high prices and facilitated by Government dissemination of planting materials, will also produce significant results in the next five years. Serious problems exist in the smallholder rubber, coconut and pepper. Production in the massive smallholder rubber and coconut industries has stagnated for a long time, and recent efforts at replanting are extremely modest. Pepper production has declined sharply in the past three years. Yet total acreage under tree crops has been expanding over the past 21 years at an annual rate of 2.3 percent most of it representing smallholder production in the Outer Islands.

86. Detailed data on area, production and yields of the principal crops are presented in Table III. From this data, it is clear that with the exception of rice where yield increases are beginning to play an increasingly important role, the main part of the output increases have come from acreage expansion. The overall rate of increase in acreage has been 2.1 percent per year despite the fact that there has been no significant increase in cropped acreage in Java during the past 10 years. Spontaneous development of new land has accounted for the major part of this expansion of cropped area. In absolute terms this has averaged about 300,000 ha per year. In the past 10 years the average annual area developed has been planted to the following crops:

Paddy (sawah)	100,000 ha
Rubber	40,000 ha
Maize	40,000 ha
Coconuts	30,000 ha
Cassava	20,000 ha
Sweet potato, soybean, groundnuts	30,000 ha
Others	<u>40,000 ha</u>
	<u>300,000</u>

Livestock

87. Data on livestock and livestock production are not sufficiently comprehensive or accurate to detect significant trends in output or numbers. Reported large animals slaughtered would indicate that the total for 1969 was below the 1961 level and considerably below 1964 and 1965. Slaughter of pigs, goats and sheep in 1968 and 1969 was 30 percent or more below the level of 1962-65. On the other hand, exports of animals, mostly cattle and buffalo, to Singapore and Hong Kong are reportedly two to three times the level of the early 1960's, and extremely large increases in exports of hides and skins are reported.

Table III : Area, Production and Yield of Selected Agricultural Commodities, 1951-1971

Commodity	Unit	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	
Rice, paddy	area	11,000 Ha.	5,815	6,114	6,465	6,613	6,570	6,702	6,798	6,990	7,153	7,285	6,658	7,285	6,731	6,580	7,618	7,781	7,516	7,904	8,096	8,156	8,406
	production	11,000 MT.	9,575	10,213	11,251	12,049	11,546	11,695	11,742	12,275	12,760	13,483	12,720	13,689	12,221	12,973	13,657	14,263	13,918	15,640	16,771	16,451	17,552
	yield	Quintal	16.5	15.7	17.4	18.2	17.6	17.5	17.3	17.6	17.8	18.5	18.5	18.8	18.2	18.2	18.6	17.9	18.5	18.5	19.6	19.7	22.5
Corn	area	11,000 Ha.	2,729	2,222	1,969	2,518	2,042	2,232	2,007	2,702	2,290	2,640	2,462	3,175	2,599	3,614	2,507	3,778	2,547	3,720	2,324	3,018	2,657
	production	11,000 MT.	2,523	1,652	1,225	2,720	1,971	1,955	1,860	2,634	2,022	2,460	2,283	3,243	2,250	3,769	2,265	3,727	2,362	3,146	2,293	2,625	2,821
	yield	Quintal	7.8	7.3	9.2	10.8	9.7	8.8	8.9	9.7	9.2	9.3	9.3	10.2	9.2	10.3	5.4	9.8	9.3	9.8	9.6	9.6	10.5
Cassava	area	11,000 Ha.	666	707	1,042	1,071	1,077	1,125	1,221	1,351	1,456	1,417	1,511	1,400	1,598	1,579	1,594	1,523	1,524	1,505	1,432	1,474	1,571
	production	11,000 MT.	7,154	7,535	9,993	9,569	9,317	9,131	10,118	11,278	12,695	11,376	11,150	10,975	11,572	12,223	10,274	13,350	10,747	11,256	11,624	10,451	9,225
	yield	Quintal	82.4	81.3	85.9	89.3	85.5	81.2	82.9	84.1	87.2	82.3	74.1	78.4	72.4	77.4	66.1	87.7	70.5	74.6	77.1	72.9	55.0
Coffee	area	11,000 Ha.	145	164	169	162	177	211	240	246	256	278	260	290	272	254	295	280	329	238	353	328	295
	production	11,000 MT.	51	50	62	53	63	75	67	69	91	117	111	114	56	118	130	129	120	157	140	142	
	yield	Quintal	3.4	3.0	3.7	3.2	3.2	3.0	3.1	2.7	3.5	3.3	4.1	3.8	4.2	3.8	4.0	4.6	3.9	3.6	4.4	4.3	4.8
Coconut	area	11,000 Ha.	1,651	1,237	1,284	1,466	1,514	1,545	1,577	1,651	1,669	1,619	1,665	1,460	1,553	1,723	1,670	1,636	1,655	1,590	1,625	1,600	1,600
	production	11,000 MT.	719	4,145	966	1,241	1,059	1,113	1,235	1,307	1,166	1,247	1,166	1,379	1,253	1,249	1,129	1,129	1,054	1,131	1,077	1,054	1,000
	yield	Quintal	7.1	9.2	7.5	8.2	7.0	6.6	7.0	6.6	6.6	7.1	7.5	8.1	8.9	6.7	6.7	5.8	5.8	7.1	6.8	6.8	6.4
Rubber	area	11,000 Ha.	59	93	116	155	157	109	212	220	173	139	146	153	150	133	156	159	112	152	153	115	115
	production	11,000 MT.	9	11	12	17	25	14	29	29	26	23	22	27	21	22	25	26	27	23	28	28	28
	yield	Quintal	1.5	1.2	1.0	1.1	1.0	.7	1.4	1.3	1.5	1.7	1.5	1.8	1.4	1.7	1.6	1.6	2.4	1.5	1.8	2.4	2.4
Palm kernels	area	11,000 Ha.	90	94	96	103	103	103	104	103	104	104	105	105	106	108	108	111	110	93	122	132	126
	production	11,000 MT.	30	39	42	43	42	41	40	39	31	33	34	33	33	34	33	35	35	40	42	46	52
	yield	Quintal	3.3	4.1	4.4	4.3	4.2	4.0	3.9	3.4	3.2	3.2	3.2	3.1	3.1	3.1	3.1	3.2	3.2	3.5	3.5	4.0	4.1
Palm oil	area	11,000 Ha.	90	94	96	103	103	103	104	103	104	104	105	105	106	108	108	111	110	93	122	132	126
	production	11,000 MT.	121	145	160	169	166	165	160	148	137	141	146	142	148	161	157	174	174	168	189	214	226
	yield	Quintal	13.4	15.5	16.7	16.9	16.4	16.0	15.5	14.2	13.3	13.6	13.9	13.5	14.0	14.9	14.5	15.7	15.8	20.2	15.5	16.2	17.9
Mangos	area	11,000 Ha.	304	278	292	324	298	317	341	331	364	377	365	371	352	373	372	383	351	395	365	402	475
	production	11,000 MT.	255	253	309	376	314	330	352	352	383	368	362	366	350	396	422	400	365	287	257	253	475
	yield	Quintal	9.7	9.1	10.6	11.6	10.5	10.4	10.3	10.6	10.7	10.3	10.5	10.4	9.9	10.6	11.3	10.4	10.4	7.3	7.0	7.3	10.0
Soybeans	area	11,000 Ha.	1,183	1,137	1,325	1,133	1,140	1,140	1,163	1,200	1,400	1,350	1,300	1,500	1,300	1,500	1,575	1,570	2,069	2,100	2,150	1,569	1,972
	production	11,000 MT.	858	762	705	757	749	698	695	695	705	620	681	632	649	717	716	762	752	752	739	775	810
	yield	Quintal	7.0	6.7	6.9	6.7	6.6	6.1	6.0	5.8	5.0	4.6	5.3	4.5	4.5	4.3	4.6	4.6	3.7	3.6	3.4	4.0	4.1
Soybeans	area	11,000 Ha.	104	117	157	125	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
	production	11,000 MT.	276	266	306	400	356	357	339	418	431	443	426	389	353	392	356	417	416	420	389	488	397
	yield	Quintal	6.6	6.5	6.7	7.6	6.7	7.1	6.5	7.0	7.0	6.8	6.8	6.5	6.5	6.8	6.0	6.3	7.1	6.2	6.6	7.1	5.7
Sugarcane	area	11,000 Ha.	61	74	74	85	90	94	90	95	99	101	99	99	103	100	119	115	112	114	109	125	125
	production	11,000 MT.	4,877	6,200	7,554	5,918	7,093	9,105	7,790	7,858	7,691	8,189	6,140	8,076	7,128	7,720	8,300	9,170	8,660	9,190	7,317	7,030	8,517
	yield	Quintal	795.5	837.8	1,026.2	696.2	723.8	866.7	855.6	827.2	768.0	820.8	620.2	852.2	660.0	772.0	702.5	757.4	792.9	806.1	671.3	566.4	713.4
Sesame seeds	area	11,000 Ha.	210	335	325	285	279	304	404	449	395	393	356	527	484	620	420	412	360	390	322	356	411
	production	11,000 MT.	1,393	2,476	2,176	2,111	1,897	2,638	2,652	3,103	2,877	2,670	2,464	3,623	3,015	3,931	2,734	2,274	2,144	2,374	3,021	3,027	3,124
	yield	Quintal	62.0	60.4	67.0	74.1	68.0	66.7	65.6	69.1	73.6	67.9	67.3	68.7	62.3	63.4	64.9	55.2	59.6	63.6	91.8	85.1	77.5
Tea	area	11,000 Ha.	146	143	142	145	145	137	135	134	136	137	137	137	140	125	133	124	124	95	95	95	95
	production	11,000 MT.	60	57	56	68	66	65	70	72	76	83	61	84	78	87	89	92	78	86	81	86	86
	yield	Quintal	4.1	4.0	3.9	4.7	4.6	4.7	5.2	5.4	5.6	6.1	5.9	6.1	5.6	6.7	6.7	7.4	6.3	9.2	9.1	8.5	10.1
Tobacco	area	11,000 Ha.	126	171	125	157	135	178	192	186	145	142	209	200	195	164	171	103	197	210	240	209	209
	production	11,000 MT.	56	73	57	67	50	61	77	67	59	59	84	69	66	77	77	53	101	110	130	120	126
	yield	Quintal	4.4	4.3	4.5	4.3	3.7	3.4	4.0	3.6	4.1	4.2	4.0	3.5	3.5	4.4	4.5	5.4	5.1	5.2	5.4	5.2	5.6

Source: Based on data provided by Central Statistical Bureau, Indonesia.

88. Ministry of Agriculture statistics on milk, meat and egg production for 1969-71 indicate very modest increases, but these appear to be projections rather than actual recorded production. The Ministry of Agriculture reported in January 1972 that per capita consumption of "livestock products such as meat, eggs and milk has been barely unchanged since 1969, i.e. 3.5 kg. of meat, 11 pieces of eggs and 0.5 liters of milk".

89. Over two-thirds of the livestock population is located on Java, Madura and Bali, about the same proportion as the population. Obvious and often repeated explanation for the low consumption of livestock products in Indonesia is the low level of income, the use of large animals primarily for power, and the limited feed supply. However, draft cattle provide meat as well as power. Cattle density in Java is still well below that of Bali and there appear to be substantial unused feed resources in the form of roughages and crop residues. On the Outer Islands there is a serious shortage of draft animals, particularly in newly settled areas.

90. All studies of consumption patterns in Indonesia indicate, however, that the elasticity of demand for meat is as high as elsewhere. The extremely rapid increase in meat and egg prices in rural markets since 1968, while rice, corn and cassava prices remained essentially unchanged, indicates that there is a serious bottleneck on the supply side, and that there is a strong rural as well as urban demand for these products. This reinforces the need for smallholder livestock programs.

Fisheries

91. The Government has reported that inland fisheries have grown 2.1 percent per year since 1969, and sea fishing increased by 2.6 percent. Per capita consumption was reportedly 10 kg. in 1970. Extremely high retail fish prices in Java indicate that for a large segment of the population fish is a luxury food. Traditional catching techniques, very weak marketing and handling facilities, and high costs of inter-island shipping and port operations contribute to the high cost of this important element in the Indonesian diet. Exports of fish, mainly skipjack and shrimps, were reported to be US\$1.5 million in 1969, US\$5.9 million in 1970 and US\$9.2 million in 1971 and US\$35 million in 1972.

Forestry

92. Production and exports of timber have increased rapidly, exceeding targets in the Five-Year Plan, due largely to foreign development of the timber industry in the outer islands and favorable world prices. Timber production in 1969 was 6.2 million cu m, 10.1 million in 1970 and 13 million in 1971. Teak production on Java, about 450,000 cu m per year, was unchanged from 1965. Timber exports are reported to have jumped from US\$3.5 million in 1966 to US\$100 million in 1970, and US\$150 million in 1971.

B. PROSPECTS AND TARGETS

93. Rapid agricultural growth in Indonesia since 1967, after more than a decade of stagnation, has produced a great deal of optimism about future agricultural growth. However, rice shortages which developed in the last half of 1972 as a result of an unusually long dry season have resulted in a more cautious view of prospects. The fact that some of the factors explaining recent increased rice output will not have the same effect in the future is now more widely accepted, and indications are that rice output will not grow at more than 3 or 4 percent annually. Even the 4 percent growth rate would involve substantial expansion of rice area in the outer islands and continued efforts to disseminate high yielding rice varieties, promote modern inputs use and improve water management in irrigated areas. Hence, to sustain output increases in agriculture, rapid progress also needs to be made in crops other than rice.

94. Two major constraints exist to expanded output of crops other than rice - elimination of the bottlenecks impeding the expansion of production on the outer islands, where great growth prospects exist, and development of a strong production thrust in the smallholder sector, which accounts for most of agricultural production and is heavily concentrated on Java. Government programs and recent studies place heavy emphasis on increasing the area under crops on Java. However, area expansion on Java has been minimal since 1968, and for both rice and corn it has halted or declined. Some additional area increases on Java can be expected, but the main emphasis needs to be placed on intensification and increasing yields there. In the Outer Islands major emphasis should be on area increase, but there is substantial scope for increased productivity. To carry out such a strategy better transport and marketing facilities between the islands are imperative. A more effective method of stimulating smallholder production is necessary if this sector is to contribute substantially to the needed increase in production. At the very least, the credit and input constraints for crops other than rice should be lifted and at least minimal smallholder programs should be pushed. The optimistic assumptions about agricultural growth in this framework hinge on many of these changes taking place. Possibilities for an even more dynamic smallholder thrust exist if village unit organizations are strengthened and used.

95. The world market for all of the crops that Indonesia exports is highly competitive. There is no share or quantitative amount that Indonesia can be expected to capture automatically. Indonesia has an apparent natural advantage in a number of important crops - rubber, oil palm and coconuts - and possibilities for expanding corn, soybeans and some other crops are good. The amounts that will actually be exported, however, will be determined largely by improving the domestic and export marketing of these crops, and insuring competitive prices and quality. The export assumptions in this analysis depend on these improvements taking place. Given such a policy, average growth rates about 5 percent per year for all sectors other than rice -- field crops, tree crops, forestry, fisheries and livestock -- should be feasible.

96. The 1971 Indonesian census, for which preliminary information was released in June, indicated a population of only 119.2 million, and a rate of growth of population between 1961 and 1971 of 2.0 percent. This is a considerably lower population and growth rate than had been assumed.

97. A rough projection of likely trends in acreage, production and trade for the principal agricultural products is presented below. Implicit assumptions include a gradual increase in the rate of population growth from 2.1 percent per year to 2.4 percent in 1980 and a GDP growth of 7 percent per year.

TABLE IV

Agricultural Sector Mission Expectations

	<u>1970</u> (Reported)	<u>1971</u>	<u>1975</u>	<u>1980</u>	<u>1980/1971</u> <u>Annual % of</u> <u>Increase</u>
Population:					
Total (M)		119.2	130.0	145.0	
Annual % increase	2.08			2.4	
GDP - Annual 1% increase					
Range			----- 6% -----		
GDP per capita (% increase)			----- 5 to 7% -----		
Range			----- 3.9% -----		
			----- 2.9 to 4.9 -----		
Rice Production					
High (M tons milled)	12.0	12.7	15.5	18.1	4.0
Low (M tons milled)	12.0	12.7	14.5	16.6	3.0
Rice Area					
High (M ha)	8.2	8.5		9.7	1.5
Low (M ha)	8.2	8.5		9.3	.9
Rice Yield					
High (quintals/ha)	14.7	15.0		18.6	2.4
Low (quintals/ha)	14.7	15.0		17.8	1.9
Per Capita Rice Production (Net: minus 6% for seed and losses)					
High (kg/capita)	102.1	102.1	110.1	120.0	1.8
Low (kg/capita)	102.1	102.1	105.7	110.1	0.8
Rice Imports					
High ('000 T)	950	600	300-400	0	-
Low ('000 T)	950	600	300-400	300-400	-
Corn and Sorghum					
Area ('000 ha)	3,018	2,687	3,500	4,000	4.5
Production ('000 T)	2,888	2,138	4,000	5,000	10.6
Yield (quintals/ha)	9.6	7.9	11.5	12.5	5.2
Exports ('000 T)		250	500	1,000	-
Cassava					
Area ('000 ha)	1,434	1,518	1,500	1,500	.1
Production ('000 tons)	10,451	9,839	11,000	11,500	1.7
Yield (quintals/ha)	73.0	64.8	73.0	75.0	1.7
Exports ('000 tons)			200 ^{1/}	400 ^{1/}	

^{1/} Product equivalent.

	<u>1970</u> (Reported)	<u>1971</u>	<u>1975</u>	<u>1980</u>	<u>1980/1971</u> <u>Annual % of</u> <u>Increase</u>
Sweet Potatoes					
Area ('000 ha)	355.8	366.7	370.0	380.0	0.4
Production ('000 tons)	3,030	2,579	3,145	3,500	3.4
Yield (quintals/ha)	85.0	70.3	85.0	91.0	2.9
Peanuts					
Area ('000 ha)	402	413	450	500	2.1
Production ('000 tons)	293	299	360	500	5.9
Yield (quintals/ha)	7.3	7.2	8.0	10.0	3.7
Exports ('000 tons)			50 1/	75 1/	
Soybeans					
Area ('000 ha)	684	630	700	1,000	5.2
Production ('000 tons)	488	422	560	1,000	10.6
Yield (quintals/ha)	7.1	6.7	8.0	10.0	4.6
Exports ('000 tons)			50 1/	200-400 1/	-
Rubber					
Area ('000 ha)	1,969	1,972	2,000	2,200	1.2
Production ('000 tons)	778	810	850	1,000	2.4
Yield (quintals/ha)	4.0	4.1	4.3	4.5	1.0
Exports ('000 tons)			800	900	-
Sugar					
Area ('000 ha)	135	135	150	200	4.5
Production ('000 tons)	715	833	1,100	1,500	6.7
Yield (quintals/ha)	53.0	62.0	73.0	75.0	2.1
Exports ('000 tons)				0	-
Imports ('000 tons)	118	150	50		
Coffee					
Area ('000 ha)	354	-	368	375	0.6
Production ('000 tons)	182	210	232	272	3.9
Yield (quintals/ha)	5.1		6.3	7.2	3.5
Exports ('000 tons)	97	(100)	120	150-160	-
Cloves					
Area ('000 ha)	83	-	100	128	5.2
Production ('000 tons)	12.5	-	20.0	30.0	7.9
Yield (quintals/ha)	1.5	-	2.0	2.3	4.3
Exports ('000 tons)	0	-	0	0-5	-
Imports ('000 tons)	8.8	-	3.5		

1/ Product equivalent.

() Estimated.

	<u>1970</u>	<u>1971</u>	<u>1975</u>	<u>1980</u>	<u>1980/1971</u> <u>Annual % of</u> <u>Increase</u>
	(Reported)				
Tobacco					
Area ('000 ha)	171	-	175	190	1.1
Production ('000 T)	71	77	100	120	4.5
Yield (quintals/ha)	4.2	-	5.7	6.3	4.1
Exports ('000 T)	14.2	-	20	30	-
Imports ('000 T)	1.9	-	3.0	5.0	-
Pepper					
Area ('000 ha)	46.4 ^{1/}	(1967) ^{1/}	50.0	55.0	1.8
Production ('000 T)	15.7	49.0	40.0	30-60	-
Yield (quintals/ha)	3.4	-	8.0	5.5-10.9	-
Exports ('000 T)	2.3	37.2	25-30	25-50	-
Tea					
Area ('000 ha)	(120)	-	110	100	1.8
Production ('000 T)	(85)	-	90	95	1.1
Yield (quintals/ha)	7.1	-	8.0	9.5	3.0
Exports ('000 T)	35	-	35	35	-
Cocoanuts					
Area ('000 ha)	1,684	-	1,750	2,000	1.7
Production ('000 T)	1,280	1,300	1,500	1,800	3.3
Yield (quintals/ha)	(7.5)	-	8.6	9.0	-
Exports ('000 T)	168.6 ^{2/}	-	200-250 ^{2/}	300-350 ^{2/}	-
Palm Oil and Kernels					
Area ('000 ha)	123	126	150	200	5.3
Production ('000 T)					
- oil	207	210	400	600	11.0
- kernels	43.3	45.0	80.0	120.0	9.8
Yield (quintals/ha)					
- oil	(16.8)	16.7	27.0	30.0	6.8
- kernels	(3.5)	-	-	-	-
Exports ('000 tons)					
- oil	(150)	-	200	300	-
- kernels	(35)	-	45	55	-
Cotton					
Area ('000 ha)	2	2	10-20	40-60	-
Production ('000 T lint)	-	-	3-6	16-24	-
Yield (quintals/ha)	-	-	3.0	4.0	-
Imports ('000 T lint)	40	60	90-100	100-150	-

1/ 1970 crop was abnormally low.

2/ Product equivalent.

() Estimated.

III. THE DEVELOPMENT STRATEGY

A. OBJECTIVES

98. A large part of the Government's conscious development efforts in agriculture during the current plan has been geared to rehabilitation of existing infrastructure and productive facilities and intensification of rice production through a massive injection of fertilizer, improved seed and pesticides. This strategy has paid off and adequate priority should continue to be given to provision of modern inputs to the farming sector and to improved water control. Yet it should be recognized that a considerable part of the output increases in agriculture can also be attributed to the spontaneous efforts of many smallholders who have continued to transform their labor into capital in the form of newly cleared land, terraced paddy fields and new plantings of rubber, cloves, coffee, etc. These smallholders have generally received very little help from Government in the form of either financial support or technical guidance. At most, the Government has provided access in the form of roads or port facilities, often built for a completely different purpose but nevertheless serving the purpose of opening up new areas for spontaneous settlement.

99. This is not particularly surprising, since farm land in most of the world has been developed in this way. Active Government efforts to promote land development and settlement are a relatively recent phenomenon. In the last century, the jungles of lower Burma were rapidly transformed into productive paddy lands by small peasant farmers encouraged by the opening of the Suez Canal and the strong European market demand for rice. More recently the opening up of the interior of Brazil - resulting from the coffee boom in the past and recent spurts in rice, maize, soybean, peanut and livestock production and exports - has been based pretty much on land and labor combined with access to markets. Government can play a role in easing some of the hardships by facilitating access and providing some capital but the basic ingredients are the availability of land and labor and a market demand.

100. Brazil's phenomenal growth record of 4.5 percent per year increase in farm output over the past 20 years was largely due to the opening up of 1 million hectares of new farm land per year. At the same time, agriculture in the older areas continued to become more intensive with shifts to higher value crops and use of modern inputs and better varieties. Brazil is continuing to follow this strategy with its new Plan for National Integration. The new trans-Amazonia highway is linking up the vast land and water resources of the Amazon with the heavily populated and depressed Northeast area. The spontaneous movement of people from the drought areas in the Northeast to the wetter areas of Maranhao to the North can now move inward onto the better soils along the higher edges of the Amazon Basin where the new road is being built.

101. The situation in Indonesia has parallels with the Brazilian situation. The country is large enough and has sufficient population to provide the labor and the markets to develop the vast land areas of Sumatra and Kalimantan. Development in the past was largely confined to a central core which now has exhausted its supply of new land and must turn to further intensification and modernization of agriculture and diversification into other sectors. However, the missing link is access. Where Brazil has built roads, Indonesia will have to improve its inter-island shipping and communications to provide a cheaper and faster link between the developing areas and the central core.

102. With past developments and investments so heavily concentrated in the central core (Java, Madura and Bali) there has been a strong natural tendency to continue to concentrate new developments in these areas where infrastructure markets and labor force are readily available. Growth of estate agriculture mining and forestry activities have tended to be relatively self-contained enclaves with only a limited effect on the local population. Organized efforts at transmigration have tended to set up little Javas and little Balis in the Outer Islands - again without heavily involving the local populations. Yet, they have provided a forward base to which friends and relatives could be called from Java and Bali and from which they could spontaneously develop new land further in the interior. The sum total of these efforts has produced a number of growth points which have served as centers for further growth in the outer islands. Roads and ports for exploiting timber and mineral resources or for shipping out estate crops can and are being used to enable spontaneous settlement into the hinterlands around these enclaves. The food requirements for these enclaves create new demands for local suppliers of agricultural products. Indeed, recent increases in rice output in North Sumatra and South Sulawesi are examples of how expanded economic activity and improved infrastructure can stimulate farm production.

103. A major objective should be to take advantage of these growth points and to focus land development and settlement on those areas where enclave developments are underway or where particularly favorable resource situations can attract substantial infrastructure investments. Agricultural developments should be closely related to the ecological conditions of the area. Initial crops after clearing should not depart radically from the proven traditional mixes of upland rice, corn, cassava and beans with gradual introduction of perennial tree crops and wet paddy when conditions are suitable. The new element in the situation should be to provide each settler with sufficient land to allow him to continue the process of cultivation on newly cleared land to provide his basic food needs while the older land is put into perennial crops. In the past, the pace of new land clearing has been limited both by the size of the plot provided and the lack of labor. The shortage of land resulted in continuous cropping of the same piece of land and declining fertility and yields. The shortage of labor, often resulting from the time required to reach his remote fields and the primitive tools at his disposal, also prevented him from expanding

his acreage in food crops. The use of draft animals and some power equipment, such as chain saws for felling trees and bulldozers to assist in stacking and removal of marketable timber, could greatly accelerate the process of land clearing, leaving the settler more time for tending his crops and improving his land. Provision of good quality seed and planting materials, together with some technical advice, is also an essential element.

104. The important thing is that conditions in the outer islands are quite different from those in the central core. Land is plentiful. Labor is scarce. Marketing is likely to be a serious constraint. However, continuing rapid agricultural growth in Indonesia will depend at least as much on an imaginative approach to outer development as on a continuing focus on intensification of production in the central core.

B. THE CENTRAL CORE: JAVA AND BALI

105. Population and infrastructure are still heavily concentrated on Java and Bali, but prospects for further agricultural development are severely limited by the scarcity of land. The IDA credits for irrigation rehabilitation can be expected to increase yields by improving the control and distribution of water supplies for both the wet and dry season rice crops and opening the way for increased use of fertilizers, high-yielding varieties and pesticides. However, the projects are not expected to result in any significant increase in area double cropped unless provisions are made for additional dry season water. Prospects for surface water storage for dry season use are currently under study, but appear to be limited in the sense that substantial low-cost reservoir and dam possibilities have not been identified. Nevertheless, projects involving storage may add as much as 150,000 ha of crops during the second plan period. Groundwater is a possible alternative, and information on its availability should be brought to the stage where significant developments can be planned. At this stage, the strategy for Java and Bali will have to aim primarily at improving the efficiency and productivity of agriculture by:

- (a) further intensification of the existing mix of crops (largely paddy) by more efficient use of fertilizer, improved varieties, and pesticides;
- (b) improving and rehabilitating an additional 500,000 ha of irrigated land now served by semi-technical and non-technical (village) systems;
- (c) more attention to dry season crops other than paddy to permit use of scarce dry season irrigation water over a larger area;
- (d) introduction of additional agriculture related enterprises which can take advantage of available labor

and feed resources (e.g. cotton ginning, dairy plants, feed industries, processing, storage, distribution of inputs);

- (e) rationalization of sugar, tea, coffee, rubber, and coconut production (see Annex 14 and 15).

106. Such a strategy will involve a continuation of the recent policies which have tried to maintain a reasonable balance between the relative price of rice and fertilizer. A broadening and redirection of credit, marketing and extension services to promote a broader range of agricultural production appear necessary to achieve a more rapid growth of output of crops other than rice. Although, until recently, rice prices had declined relative to prices of other crops, rice was the only crop receiving special subsidized inputs, credit and extension services. Recent increases in rice prices should permit some reduction in the subsidy for fertilizer for rice with a view toward eventual elimination.

107. The historical pattern of development in Indonesia has been quite different from most countries where substantial urbanization has occurred long before agriculture has reached the degree of intensification already achieved in Java and Bali. The inward looking psychology of the Javanese village, dominated by the "Lurah" or village chief, has led to a perpetuation of a basically subsistence agriculture with a sharing of work and incomes within the village. The landless and the near landless share the harvest by spending long hours cutting individual heads of grain with the "ani ani" knife, through meticulous hand weeding of the paddy fields, by cutting firewood or forage, by petty marketing and transport activities and occasional labor on maintenance of roads and irrigation facilities. The lack of specialization and the inefficiencies of traditional small-scale enterprises are perpetuated by the lack of surplus savings and investment funds needed to break out of these traditional patterns.

108. Despite this tradition of sharing, the gap between the landless and the elite groups in the village--those with more than a hectare of paddy, the shopkeepers, the village officials, the rice miller (often combined in the person of the Lurah)--is considerable. It is reflected in such things as ease of access to technology and credit, and in the prices received for produce. The BIMAS program, the Bank Rakjat's village units and the INPRES program - of small scale public works have, to some extent, succeeded in bringing outside influences into village. Much more could be done along these lines to bring about change in the village through stronger extension services and additional injections of outside funds. However, ways must also be found to encourage more efficient mobilization of village resources.

109. The traditional system of rotating sugar and rice production is one approach to mobilizing substantial blocks of land from smallholders to achieve economies of scale. In prewar days this produced a highly efficient sugar industry. In recent years, the low rents paid for sugar land, the

pressures for increased rice production, the deterioration of factories and weak management of the government sugar enterprises have resulted in a substantial decline in the output and incomes from sugarcane production. A recently completed sugar study contains a number of suggestions for rehabilitating the sugar industry which are now incorporated in a Government program for the industry with financing from IDA and the Asian Development Bank.

110. Innovative cooperative movements aided by the Japanese in Central and East Java and the Germans in North Sumatra provide another approach to pooling resources at the village level and linking the village to the outside world. The Indonesian tradition of sharing and cooperation should facilitate the development of such cooperative forms as a means of improving the supply of inputs and providing know-how together with access to markets on more reasonable terms. Such developments should be particularly encouraged where village or local centers for primary processing, marketing, supply of inputs, and technical advice can be organized.

111. Again where PNP's or private enterprises are involved in producing, processing, or marketing particular crops, efforts can be made to encourage closer links with smallholders. Such activities might be encouraged by channelling credit through such enterprises to allow development of contract relationships. Current high interest rates for working capital and marketing loans may be a deterrent, but proposals for new investments in such enterprises should include provisions for smallholder participation.

112. The Mitsugoro Project in Lampung - a Japanese-Indonesian joint venture agricultural project - illustrates the possibilities of such cooperation. Although Mitsugoro provides only the drying and marketing facilities and some seed for smallholders, the demonstration effect of producing maize on "alang alang" infested land - together with access to export markets have caused the local people to substantially expand acreage and output of maize.

113. Thus there are a number of alternative approaches to motivating change at the village level. Smallholders in Indonesia are extremely hardworking and market responsive. The strategy should be to provide incentives and to introduce some outside resources--capital, technology and management. Such efforts will be heavily dependent on obtaining the full understanding and cooperation of the "Lurah" and should build to the extent possible on existing agencies and organization. For example, the role of the "ulu ulu" or local water master is extremely important in obtaining more efficient water use and in mobilizing resources for maintenance and improvement of local irrigation systems. The village units or mobile units of the Bank Rakjat should play an important role in providing financing not only for short-term production needs, but also medium- and long-term on-farm needs as well as small processing, storage and marketing facilities at the village level. The INPRES program under which the Central Government provides local government's grants of Rs. 100 per capita for local public works should in addition to providing additional employment open the way for improving the basic village infrastructure.

114. In some cases the initial impact of modernization and change may be to benefit the more well-to-do farmers who can take the risks and have easier access to credit and inputs, but the important thing is to get development started. Once development gets going, much more emphasis will have to be given to obtaining a wider sharing of the benefits. These can take the forms of better agricultural services to the farmer--credit, input supplies, marketing and extension services, but eventually including a much broader range of health, educational and social services.

115. However, as already pointed out, the scope for agricultural development in Java and Bali is limited and can probably barely keep pace with the growth in the agricultural labor force. The major thrust must come from developments elsewhere--industrial growth, mining, forestry, fisheries, and a major expansion of agriculture in the Outer Islands.

C. THE OUTER ISLANDS

116. Indonesia has considerable unused land resources in the Outer Islands. Historically, the problem has been attributed to the reluctance of Javanese to leave Java. Despite efforts to move people from over-populated areas to the Outer Islands through officially sponsored "transmigration" programs and the labor recruiting efforts of estates, and mining and lumbering enterprises, large areas of Sumatra and Kalimantan are still undeveloped and often inaccessible. The number of transmigrants of all categories has never exceeded 100,000 persons in any one year as compared to the annual growth in population in Java and Bali of almost 2 million.

117. Details of past efforts at transmigration are discussed in Annex 3. The principal problems involved in the past efforts appear to be:

- (a) selection of transmigration sites appear to have been based more on accessibility and the availability of rights to land than on suitability for specific agricultural purposes;
- (b) settlement was based on cropping systems suitable for Java rather than in the Outer Islands making success or failure heavily dependent on providing irrigation for wet rice;
- (c) lack of funds delayed infrastructural developments;
- (d) programs did not provide for active participation of local people in the development, creating tensions between the local population and the transmigrants;
- (e) selection of transmigrants gave priority to persons from the poorest areas of Java and Bali and made no provision for including people with resources and abilities needed to develop the new areas.

118. The total number of families resettled under all organized schemes over the past twenty years appears to have been of the order of 150,000 families. Reorientation and expansion of the program along the lines suggested in Annex 3 can be expected to increase this number in the future, but the bulk of the migrants to the Outer Islands will have to be spontaneous migrants attracted by increased economic opportunities created by a wide range of developmental activities. Already, opportunities associated with lumbering, mining, and related infrastructure developments have created opportunities which have raised wages in Sumatra and Kalimantan to levels of two to three times those prevailing in East Java. Yet the difficulties of communications and transportation between Java and the outer islands continue to restrict the flow of labor into these developing areas. Possibilities for low cost production of rice and export crops in the Outer Islands are rapidly running into marketing problems resulting from the inefficient inter-island shipping system. At the same time the cost of supplying inputs and technical advice tends to be much higher because of the poorly developed transport system and the wider geographical spread of economic activities.

119. Up through 1972, IDA involvement in the agricultural development of the Outer Islands had been confined to rehabilitation of estates (mainly rubber and oil palms) some irrigation rehabilitation and a fisheries project in North Sulawesi. Recent road projects in Sumatra and Sulawesi and their associated studies can also make a significant contribution to the development of these regions. A most significant project will be the recently concluded credit for the rehabilitation of inter-island shipping.

120. A project financed by IDA in early 1973 for assisting smallholder rubber producers in increasing the efficiency of production and marketing of rubber and diversifying into oil palms is expected to produce results which can provide the basis for upgrading productivity and incomes of the large numbers of smallholder rubber producers now living on the margins of subsistence. However, so long as projects are confined to improvement of estate production and to closely supervised smallholder replanting schemes, the impact on total rubber output and smallholder incomes will not be significant. The next stage must be the development of a multi-pronged program which will draw on all available resources, public and private, and provide a minimum package of credit, planting materials, inputs, technical advice, and processing and marketing facilities designed to reach a much larger number of producers. This will involve development of nucleus estates as well as much closer ties between the government and private estates with the smallholder sector to make the minimum package available on a much larger scale. The sort of arrangement proposed will in some respects resemble the BIMAS programs for rice--where the most efficient technical use of inputs was sacrificed to a considerable extent in the effort to reach a larger number of farmers. The relative success of smallholders in expanding clove production shows the responsiveness of smallholders when suitable planting materials are available and market prospects good.

121. A major element in the costs of replanting or planting of tree crops consists of subsistence payments to producers during the period before trees come into bearing. To the extent that smallholders can obtain subsistence from intercropping or from other cropland or can obtain subsistence from nearby relatives or other employment, costs of planting and replanting can be kept to a minimum. It has been for this reason that a substantial amount of new plantings have been carried out by smallholders over the past decade despite very limited Government support. The provisions of improved planting materials and minimum levels of technical advice would have raised the level of productivity of new planted areas substantially without significant increases in costs. Both government and private estates could be encouraged to supply such material at commercial prices with credit coming from the Bank Rakjat.

122. A further possibility which should be explored is the use of stimulants in connection with rubber replanting. Malaysia has had considerable success with a fertilizer cum ethrel program in stimulating the replanting of smallholder rubber. Depending on the clones and the condition of the tree, yield increases of 40 to over 100 percent have been achieved. This has made it possible in many cases to replant a portion of the area of rubber without reducing production. Although systematic trials on unselected seedlings under smallholder conditions have not been carried out in Indonesia, higher immediate yields and earlier replanting may outweigh a longer productive life at lower yields, particularly if future benefits are discounted at a realistic interest rate. Field trials have now been initiated and results are to be analyzed in economic terms to determine the scope for use of stimulants.

123. There is a marked lack of information concerning the condition of smallholder rubber, but sufficient is known to allow the planning of an appropriate development strategy. A large proportion of the smallholder rubber, particularly in the more accessible areas in Northern Sumatra, is exhausted or nearly exhausted, in that the remaining tapping panels have very thin low yielding bark. However, there are significant areas of sleeping rubber which has not been opened for tapping and of rubber with some 4-5 years of tapping life on virgin high panels. Although these latter categories of rubber have been maintained badly by any standard, it is very likely that economic responses to ethrel stimulant could be obtained. Strategy should be to exploit such rubber to exhaustion, over some 4-5 years, while replanting adjacent already exhausted areas. Over this period of time, application of fertilizer would generally be unnecessary. In Malaysia and Ceylon, use of ethrel is considered economic where an additional annual yield of 100-150 kg/ha is obtained. In the categories of rubber mentioned above, yield increases of 200-400 kg/ha should be attained.

124. In the major rubber smallholder areas the next steps should be:

- (a) Survey and identification of major areas where ethrel could be applied for the next 4-5 years.

- (b) Investigations into concentration of ethrel, place of application on the tree, frequency of application, and timing of application, all in relation to yield responses with smallholder rubber.
- (c) Provision of finance and advice for ethrel application and for improved cultural practices.
- (d) Organization of a replanting scheme in adjacent areas.
- (e) In addition to ethrel application, immediate and economic yield improvements could be obtained through control of the inter-line undergrowth and the use of correct tapping techniques.

125. Processing and marketing margins for exported rubber are excessive in Indonesia particularly in the smallholder sector. Recent studies under the Agro-Economic Survey of Indonesia show that high transport costs, poor quality latex or slabs, heavy unofficial charges, and excess processing capacity are the principal factors explaining the low percentage of the f.o.b. price received by producers. The basic problem is one of preventing spoilage of the latex after it is taken from the tree. The poor quality of smallholder rubber is the result of primitive and improper coagulating procedures which produce a slab with a dry rubber content of only 40 percent to 50 percent usually contaminated with dirt, sticks, stones and other materials. Annex 8 sets forth some suggestions for coping with this problem--essentially the need for organizing latex collection or group coagulating centers which can deliver better quality rubber to the crumb rubber factories for processing directly into quality block rubber without the need for smoking or remilling. An encouraging recent development has been the establishment of some block rubber processing plants in connection with private estate operations with sufficient capacity to process substantial amounts of smallholder rubber as well as their own rubber output.

126. In remote areas where marketing conditions are especially difficult (the average smallholder is estimated to receive less than 30% of the f.o.b. value of his crop) the encouragement of collective processing and marketing of ribbed smoked sheet could be especially effective in increasing the net return to the smallholder. Low cost group processing centres should be established in suitable locations. Following the example of private operators in Jambi, with attention to cleanliness, smallholder rubber can readily be processed into RSS 2 & 3 grades.

127. In the more accessible areas, and particularly in the neighbourhood of recently constructed block rubber factories designed to process smallholders' crop, the assistance should lean more toward providing a price incentive to encourage the growers to improve the quality of slab or of air dried sheet, delivered to the factories or towards developing an efficient latex purchasing and delivery system. The present system

whereby block rubber processors invest heavily in machinery for cleaning unnecessarily dirty and adulterated rubber is extremely wasteful. The processors should be urged to provide extension services from their factories to the growers aimed at improving raw material quality. Both growers and processors would benefit from such action.

128. With 10 to 15 million hectares of potential agricultural land awaiting development in Southern Sumatra, Southeast Kalimantan, and Southern Sulawesi, all possible methods should be used to expedite the process of opening up new land. Unlike the situation in the heavily populated core areas of Java, Madura, Bali, and Lombok, availability of land is not likely to be a constraint for the next several decades in the three priority areas selected for early development. Management capital and labor are likely to be the key constraints.

129. Southern Sumatra: Regional studies recently initiated in connection with the Trans-Sumatra Highway Project are expected to identify development priorities in the southern part of Sumatra covering the provinces of West Sumatra, Jambi, South Sumatra, Lampung and Bengkulu. The study will make suggestions for a network of access and penetration roads to link up these new development areas with existing trunk roads and ports. The new Java Sumatra ferry now under consideration with facilities for roll on roll off freight handling will cut transit time from the current 5 hour sea voyage to one hour and could be a major factor in integrating Southern Sumatra with Java. Meanwhile, a number of independent efforts are already in process in Lampung and South Sumatra provinces consisting of past and current transmigration projects, irrigation developments, rubber and oil palm estates, and mixed smallholder gardens with rubber, pepper, cloves, coffee and subsistence food crops. The Mitsugoro maize project, briefly described above, has encouraged other Japanese companies C. Itoh and Mitsubishi to start similar projects. Population of the area has been growing at an estimated rate of over 5 percent per year.

130. Analysis of available data on soils, topography and land use indicates that the basic ecological conditions in Lampung Province seem to extend for a considerable distance to the North. Developments to date have been ad hoc involving a number of different central and provincial government agencies. Land use rights have been a serious constraint even on "government owned" land since traditional tribal rights have never been clearly defined. To accelerate the development of this large new area, the establishment of a regional development authority to take charge of the detailed planning, funding, and execution of development for the region should be considered. Such authority would be expected to take over all aspects including the regional studies now under way, and to coordinate the efforts of various agencies currently active in the region. The aim should be to review all on-going developmental activities to insure consistency with broader regional objectives of efficient resource use. It should also lend active support to the planning, preparation and implementation of new projects needed to complement or expand existing projects as well as in other priority fields as they are identified.

131. In addition to better governmental coordination and planning at the regional level every effort should be made to bring in resources from the private sector. Possibilities for granting additional concessions for developing new rubber and oil palm estates which could serve as nucleus estates for smallholder development should be promoted. Transmigration schemes based on rubber, oil palm and other tree crops might usefully engage managing agents to carry out the plantation establishment phase. Private processing facilities should be encouraged so long as processors agree to provide guidance and inputs needed to stimulate smallholder production. The purpose is not to create a multitude of foreign enclaves but to get development going and to maximize the links between foreign enterprises bringing in management, technology and capital, and the local smallholder.

132. The emphasis in transmigration programs must be changed from the movement of people out of depressed areas in Java and Bali to the development of the new areas. The people already on the ground should be brought actively into the new developments rather than being displaced as squatters on Government land. The shape of development should not be the re-creation of little Javas in Southern Sumatra, but the development of new farming systems suitable for Southern Sumatra. Official transmigration schemes should provide each settler sufficient land to enable the settler to bring in additional relatives and to take care of the needs of growing children. Income targets should be sufficiently high to attract a wide range of people including those with resources and management talent. Introduction of some mechanization, both animal and tractor power, will probably be necessary to cope with larger-sized farms needed to provide such incentives. Possibilities of developing mixed farming systems combining perennial crops with annual crops rotated with a pasture/legume phase should be tried on a sufficient scale to permit early application of results. Meanwhile, projects for smallholder settlements based on tree crops combined with traditional food crops should be developed for early implementation. The heavy emphasis on providing irrigation for wet rice production should be changed to give more emphasis to development of rainfed crops.

133. Larger farms without irrigation will require additional power and arrangements for an increased supply of draft animals will be needed. The sort of project recently financed by IDA for South Sulawesi and Sumba to expand cattle production, both for draft purpose and beef production, should be developed for Southern Sumatra and Southeast Kalimantan at an early date. Such a project could become the center for practical field trials to develop techniques for establishing improved pastures and legume cropping systems in areas now infested with "alang alang" (*Imperata cylindrica*).

134. Finally every effort should be made to strengthen extension services throughout the area. A first step should be to unify services at the local level. At present each Directorate-General in the Ministry of Agriculture has its own field staff, and there is little or no coordination among them.

135. South Sulawesi: In addition to the regional major development program proposed above for South Sumatra, on-going developments in South Sulawesi should be given strong support and several new activities should be initiated. Although topography severely limits the agricultural potential of Sulawesi, the recent growth of agricultural output in South Sulawesi and the existing infrastructure and the substantial investments planned in connection with nickel development provide opportunities for fairly quick developments in several fields. These include further intensification and expansion of rice production, expansion of cotton, sugarcane, maize, and a wide range of other crops, and developing cattle production to provide additional draft animals and beef for export.

136. Expansion of rice output will be largely a question of market outlets for the surplus production. At present the only sizeable movements of rice out of South Sulawesi have been handled by BULOG who then ships rice to deficit areas in Kalimantan, North Sulawesi and parts of Nusa Tenggara. During the Mission's visit in March 1972, DOLOG, the local arm of BULOG in South Sulawesi, had stopped buying rice causing a sharp drop in rice prices which, if permitted to continue, would certainly slow down or reverse the recent rapid growth in rice output. A more efficient inter-island shipping system would enable surplus rice to move from South Sulawesi.

137. Possibilities of producing cotton and sugarcane appear good, and immediate steps should be taken to initiate extensive field trials. Considerable scope exists for expanding the acreage and output of a wide range of other crops such as maize, cassava, soybeans and peanuts. The livestock project recently financed by IDA would be a first stage in developing a cattle industry. Sericulture is a traditional labor intensive activity which could be greatly expanded and modernized to take advantage of the growing supply shortages in Japan.

138. Southeast Kalimantan: Development of Kalimantan to date has been largely in terms of exploiting forestry and mineral resources. Outside of these pockets of development the land is in large part inaccessible and unexplored. Available maps and data on soils, topography and climate are not sufficiently detailed or accurate to permit useful interpretation except on a broad macro basis. However, the mission has selected Southeast Kalimantan for early development because of its proximity to the port of Banjarmasin with its communication and transport links to Java and the other islands. In the area just east of Banjarmasin there are considerable areas of gently undulating to hilly land. Most of the land is still forested, and initial settlements have been based largely on shifting cultivation and perennial tree crops. Developments along the lines suggested for Southern Sumatra appear quite feasible. The first step should be to carry out studies to delineate the area with the highest potential and to initiate field trials to develop suitable cropping systems. Initial developments could be focused on rubber and livestock for which conditions are quite suitable.

D. FORESTRY

139. Forest policy should aim at a major expansion of the wood processing industry, first, to achieve self-sufficiency in paper production by 1985 and wood based panel products by 1975 and, second, to increase sawnwood and plywood exports to some 9 million cubic meters roundwood equivalent by 1985. This will have to be accompanied by a steady reduction in log exports to about 10 million cubic meters of roundwood by 1985. Such a policy will depend to a large extent on renegotiating existing concession agreements to ensure timely investments by the concessionaires.

140. Other important objectives are to rehabilitate water catchment areas, particularly those in Java that are in critical condition; to preserve the remaining protective forests and nature reserves; to manage productive forests in order to increase yields on a sustained basis; to expand the area of pulpwood plantations; and to release forest lands that are better suited to agriculture.

141. The implementation of this policy will require vastly improved educational, research and training facilities; radical changes in the administration and organization of the forest service; a better knowledge of the location; quantity and quality of the timber resource; improvements in concession allocation and control; external financing and technical assistance.

142. Immediate steps could be taken to encourage local wood processing industries by introducing appropriate tax measures including a rationalization of existing royalties, taxes and informal levies into a well defined unified system which would gradually increase the export tax on logs as compared to processed wood products.

E. FISHERIES

143. Indonesia has considerable fish resources both marine and inland which could be much more intensively exploited. Consumption of fish is very low in the heavily populated regions such as Java and Bali, because of short supplies and high prices. The basic cause is the inefficiency of methods used to catch fish.

144. A strategy for fisheries development is proposed which aims at utilizing the export potential for products like shrimp and tuna to permit a sizeable increase in domestic fish supplies at much reduced prices. In line with this overall strategy, four projects are suggested. Three of them, centered on Java and formulated as complementary projects, consist of increasing the marine catch by the use of trawlers and motorized small boats, increasing the yield of inland fisheries by upgrading existing exploitations and opening new areas and improving shore facilities, particularly for ice making, freezing, storage, processing and marketing. The value of

shrimp exports would by itself make the proposed investments attractive. The addition to domestic fish supply is estimated at nearly 200,000 tons annually. The fourth investment project would be centered in the outer islands particularly around Maluku and Nusa Tenggara. It consists of the development of skipjack pole fishing with an eventual production target of some 70,000-80,000 tons annually, most of which would be destined for export.

F. LIVESTOCK

145. The livestock industry's contribution to the economy has been primarily to provide draft power, with livestock products accounting only for some 3 percent of GNP and less than 2 percent of all exports. Production is mainly by smallholders. Cattle and buffaloes are kept as draft animals for crop cultivation and transport with meat and hides as a by-product except in Nusa Tenggara and Sulawesi provinces where cattle are also kept to produce beef from natural grassland. Poultry, pigs, and small ruminants are raised as part-time family enterprises to supplement subsistence with marketing of small surpluses. There is some specialized dairying for urban markets, but the bulk of milk consumption is in the form of imported dry milk powder, part of which is being recombined into condensed and whole milk. Large-scale, modern poultry and egg production has started around Djakarta, but village production is still important.

146. It is suggested that livestock development be looked at primarily as a tool for raising the aggregate income of existing smallholder communities. Specific objectives, such as increasing the availability of animal protein at reduced prices, would be realized as an integral part of the gains from agricultural intensification and diversification. A large proportion of increased meat supplies should come from an urgently required increase in the number of draft animals. Quickly realizable improvements in poultry and small ruminant production could assist in checking meat prices thus leading to a more rapid increase in the number of draft animals by encouraging owners to keep their large ruminants for draft rather than selling them for slaughter. At the same time, export opportunities could be met.

147. Development of underutilized land resources offers opportunity to develop mixed farming or monoculture pastoralism particularly in areas with low population pressure. These activities would lead to increased availability of draft cattle in the outer islands and to the production of beef suitable for local consumption or for export within the Southeast Asian region. The major considerations in resource development would be:

- (a) to establish a land use pattern which can be sustained over a long period of time, considering the general difficulties encountered in maintaining soil fertility and structure under wet humid tropical conditions;

- (b) to create income conditions which are adequate to attract new farmers to areas with relatively poor infrastructure and living conditions.

However, the immediate objectives of such a program would be to utilize grasslands with poor agricultural potential for the establishment of nucleus herds which can supply the urgent needs for more draft power in areas selected for rapid settlement and development in the Outer Islands.

G. FINANCING AGRICULTURE

148. Five state banks operate in the agricultural sector, with fairly well-defined but overlapping responsibilities. The three most important ones are Bank Rakjat Indonesia (BRI), specializing in rural credits, Bank Pembangunan Indonesia (BAPINDO), the industrial development bank, financing commercial production, including estates and agro-industries and Bank Bumidaya specializing in financing the estate sector. Local and foreign private commercial banks are not active in the sector. Interest rates have been progressively reduced, tending to follow, somewhat tardily, the decrease in the inflation rate. The last reduction was in June, 1972. Except for some foreign loans for private estates, almost all development loans (for agro-industries and state-owned estates) and seasonal loans for rural credit have been at 12 percent annual interest for the past three years, while all the rest (including marketing loans) are now at 24 percent or above. Institutional rates for loans outside agriculture go up to 36 percent.

149. Production credit for small farmers is obtainable from a variety of sources, but both the supply, and farmers' access to it, are limited. Apart from BRI, sources include fertilizer distributors, tobacco and sugar estates, village and paddy banks, cooperatives, pawnshops, and provincial development banks. Although private moneylending is illegal, it remains an important source of rural credit, albeit at very high interest rates. By far the largest institutional source is BRI, which operates profitably as a commercial bank with full banking services. About one-third of its operations in 1970 was in agricultural production, for which it disbursed about Rp 36 billion. It is at present operationally inefficient, and ADB has provided a loan of US\$3.4 million, for the foreign exchange cost of a US\$4.4 million project for modernization. The project includes some organizational and operational modifications, the adoption of improved accounting and reporting procedures, and the mechanization of 126 of its 218 branch offices, affecting over four-fifths of its business transactions.

150. The rice intensification programs have had an important impact on rural credit. The original BIMAS program (1966-1970) used specially formed cooperatives as the medium through which farmers obtained credit. These failed because of management inadequacies, the lack of loan security, and nonevaluation of farmers' loan repayment ability. Over the 5 years Rp 7.7 billion was advanced, but around one-half remains outstanding. Under

the BIMAS Gotong Rojong program (1969 and 1970) about Rp 22 billion was advanced, but about three-fourths is still outstanding. Credit was supplied and charged as a fixed package per ha to every farmer in the selected area, whether or not he wanted, needed, or could efficiently use it; a method contrary to basic credit and extension principles. The village headmen received the total allocation for their villages for distribution, but as no records were kept, farmers easily evaded repayment. In 1970/71 it was replaced by the Improved BIMAS program, which is continuing. Under this program, credit is supplied in cash and kind to approved farmers through about 1,600 specially created village and mobile units of BRI. These units show promise of becoming the most satisfactory of all methods tried so far to bring credit within reach of small farmers. The most important and impressive effect of these intensification programs has been that currently over 10 percent of the estimated 12 million rice farmers are receiving some institutional credit, compared with a negligible number five years ago. This has been achieved by familiarizing farmers with improved planting techniques, and inducing them to adopt the techniques through much improved credit availability.

151. Smallholders produce a variety of cash crops, the most important being, in order: rubber, coffee, copra, pepper and tobacco. Little has been done to help them, the constraints being lack of planning, shortage of finance, and ineffective extension services. Rubber smallholdings (about 1 million families on 1.6 million ha) badly need replanting, and IDA is currently considering a development project in North Sumatra aimed at helping some 7,000 holdings to replant and plant new areas with rubber and oil palm, and assist 16,000 to improve the primary processing of their latex through local coagulating centers. The financial implications of this project for future smallholder development are important. On the basis of rubber prices and interest rates prevailing in early 1972 rubber replanting did not appear attractive. However, the technology for improving efficiency and lowering costs for smallholder rubber production was known and had been successfully applied in Malaysia. In order to develop a minimum package program for smallholders to serve as a basis for long-term rubber development loans IDA decided to proceed with the project. Price prospects in 1973 for synthetic and natural rubber make rubber investments seem much attractive.

152. Although records are incomplete, the mission estimates that in 1970, loans for rural credit reached about Rp 22 billion, compared with less than Rp 1 billion in 1966, largely as a result of the rice intensification programs. However, less than one-tenth of this was medium-term. 1970 loans were about 1.4 percent of the estimated value of rural production in that year. While this figure is small, it is a considerable advance on 1967, and compares with 1.4 percent in Malawi (1967), 1.3 percent in Thailand (1967), and 1.5 percent in Zaire (1970). Both Malawi and Thailand were able to double their percentages over the following 3 years, and this suggests a further improvement of this magnitude is possible in Indonesia. Probably between 1.5 and 1.8 million Indonesian farmers received some institutional credit in 1970, some 7 to 9 percent of the 20 million farmers in the country.

153. The major shortcomings of the current rural credit programs are the lack of long-term, and the small amount of medium-term credit. For the next few years at least, the rural sector could absorb a minimum of 25 percent of annual loans as medium and long-term. Medium-term credit is needed to finance small pumps, draft animals and fishery equipment, in addition to the rice processing and irrigation works currently receiving it. In the longer term loans for smallholder replanting, on-farm improvements and fisheries equipment will require considerably more funds than have been allocated for rural credit in the past, if the sector is to retain its current momentum and meet the above expansion. BRI, would seem to be the logical channel but, it is doubtful if BRI's current modernization project, valuable as it is, will go far enough and have sufficient impact on BRI's overall efficiency to enable it to meet the country's rural credit requirements over the next decade. In addition to the modernization project, BRI requires an intensive staff training program, a study to determine how village and mobile units can best serve farmers' financial needs, consideration of a long-term development strategy, which would include an overall financing program and development of an effective system for medium and long-term lending.

154. Financial data on the commercial sector (government and private enterprises, and agro-industries) is fragmentary. Short-term funds are available from the commercial banks. Limited longer-term development funds have come from government and some private sources, but until recently, state bank loans of more than 5 years for private development have been prohibited by Government. The limited funds for medium-term agricultural development in this sector have come from the 5 state banks, and more recently from BAPINDO and the 1968 Joint Financing Scheme (JFS). Under JFS, borrowers contribute 25 percent of the project cost and the rest comes from Bank Indonesia (one-third) and the participating state bank (two-thirds) through a loan over 5 years maximum of 12 percent annual interest. Of the Rp 71 billion outstanding at the end of 1971, one-quarter was for agriculture.

155. Following a 1970 reorganization scheme for BAPINDO, IDA has recently (May 1972) agreed a credit of US\$10 million, which would finance BAPINDO's foreign exchange requirements for two years, for loans to small- and medium-sized manufacturing enterprises, including agro-industries. Since 1968, BAPINDO has lent Rp 12 billion, of which about one half was for agricultural processing (textiles, rubber processing, pulp, paper and printing).

156. Bank Indonesia credits advanced to banks for agriculture (production and marketing) have averaged about one quarter of total credits over the past four years, and were Rp 42 billion at the end of 1971. Of the total of almost US\$2 billion of foreign investments approved by Government since 1967, about one-quarter was for agriculture (mainly forestry), the major investors being the Philippines, S. Korea, Japan, USA and Malaysia, with Indonesian participation about 7 percent. Complete and systematic data on foreign investments is unavailable, but of the approved investments above,

only 20 to 25 percent had been invested by the end of 1971. Approved domestic investment (1967 through 1971) was about Rp 0.14 billion, of which only a small part was for agro-industries. However, from the published data, it would seem the commercial agricultural sector is obtaining a reasonable share of the available development funds.

157. The main deterrents to increased private investment are the 5-year maximum term for loans, the interest rate structure, the compulsory 25 percent contribution by the borrower, and the nonavailability of loans for permanent working capital. In spite of these, state banks have a large backlog of loan applications, mainly because of the subsidized 12 percent annual interest rate. Under a new scheme, loans using government-to-government and IDA foreign aid funds may be made up to 15 years.

158. The 12 percent annual interest rates for development loans compares with the current minimum 24 percent for all other agricultural loans for production and marketing, and with rates which go up to 36 percent from state banks for other purposes. The 12 percent rate involves a subsidy element since this is only two-thirds of the rate paid by state banks on time deposits of more than one year. If the strong and growing demand for development funds is to be matched by the supply on a self-supporting basis, it will be necessary to adjust interest rates generally to bring them more into line with the opportunity costs of capital and incentives needed for resource mobilization under conditions with relatively stable price expectations.

H. MARKETING AND PRICES

159. Stabilization of rice prices has been the major concern of the Indonesian Government in the agricultural marketing area for decades. The present Government has carried out an especially strong policy to stimulate rice production and stabilize producer and retail prices since 1968. The Government has attempted to maintain a fixed farm price for rice of 13.2 Rp/kg of dry stalk paddy and a retail ceiling price 50 Rp/kg for milled rice in all parts of the country. The government logistic agency BULOG has implemented the rice policy by buying and selling in the market to support these price levels.

160. Considering the large number of very small farms and the great seasonality of rice production, rice price stability was achieved in 1970 and 1971 with remarkably small transactions by BULOG in the domestic market. The reasons for this are probably: (a) that only a small fraction (20 to 30 percent) of the total rice harvest is marketed; (b) despite restrictions on their activities, the private trade must have accomplished most of the task; (c) larger production allowed a large degree of local or provincial self-sufficiency; and (d) BULOG continued to rely heavily on imported rice.

161. Most of the rice used by BULOG is imported and is used for paying wages in kind to government and institutional employees, and for deliveries to military personnel. It would appear that the amounts of rice used to stabilize prices was relatively small, and that the demand for imported rice was for relatively localized markets. The Government, through BULOG, had apparently not found it necessary to develop the movement of domestic supplies into these markets.

162. Early in 1972, with domestic rice prices apparently stable and substantial surplus stocks in Japan continuing to hold world rice prices at their lowest postwar levels, the Government lowered its rice production targets and reduced planned imports from recent levels. Statistical adjustments in both production and population implied a reduced need for rice and government officials indicated that continued concessional imports were desirable to help bridge the resource gap and need not affect incentives for domestic production. Recent sharp increases in rice output in South Sulawesi and North Sumatra had led to marketing problems and unsold stocks in early 1972 and were expected to dampen farmer incentives for further rice expansion. This was due in part to a variety of official and unofficial restrictions on goods movements and a quite inadequate and expensive transport system, especially inter-island shipping and road transport.

163. At the same time, however, BULOG, in an effort to improve the quality of its domestically procured rice, raised quality standards and also reduced advance payments against contracts from 50 percent to 25 percent in early 1972. The net result was a shortfall in BULOG's domestic procurement in 1972 of about 250,000 tons. Unusually dry weather during that dry season had also given rise to lower crop acreage and yields both for rice and other dry season food crops and it now appears that the main 1971/72 crop may also have been overestimated. As a result of this situation Government was suddenly faced with a rice crisis and was forced to increase rice imports sharply in a situation of growing scarcity and rising world market prices to dampen the rise in domestic rice prices.

164. The present sharp increase in international rice prices is not an unusual phenomenon. With the bulk of world's rice production coming from rainfed land, rice output is subject to substantial fluctuations depending on weather conditions in the major rice producing areas. Since only about 4 percent of the world's output enters international trade relatively small changes in output can cause significant swings in international rice prices. Sharp increases in cereal prices in the mid-60's were followed by a steady decline until early summer in 1972 when the current increases began.

165. Taking a longer view, it is clear that rice prices will continue to fluctuate with weather and short-term supply rigidities. However, since most of the world's output is produced by smallholders and consumed on or near the farm, most production is not affected by short-term price fluctuations. The relevant considerations are the longer term factors such as cost trends, population and income growth and changes in tastes. From this

point of view the rice picture in Indonesia does not appear to present insurmountable problems. Productivity increases already in progress are likely to continue particularly as current investments for improving water control and distribution mature and lead to cost reductions. Population growth has been less than previously estimated and positive measures for population control are being initiated on a substantial scale. Rise in per capita incomes can be expected to increase rice consumption among the poorest groups but already there is evidence that shifts away from cassava and corn to rice have been taking place but wheat flour consumption has been rising indicating some shift from rice to wheat, particularly in the urban areas. With per capita rice consumption already at a level of over 100 kg substantially higher than prewar, and prospects of further increases in availability of rice, significant increases in the relative price of rice are probably not needed. Government should try to dampen current short-term increases in rice prices through expanded import but should aim at maintaining a reasonable balance between fertilizer and rice prices.

166. The marketing situation for other crops suffers from many of the problems associated with rice. Very little success has been achieved in integrating the market to reflect differences in costs of production and transport.

167. Since 1968 the nominal price of rice was stabilized and the real price had declined sharply. Other prices, as well as many agricultural product prices had risen sharply. Especially rapid increases in soybean, peanut and coconut prices developed, with livestock prices rising especially sharply. This reflected the lack of progress in agriculture outside of rice, and the constraints on production of other crops while credit, fertilizer and extension services were being channeled to rice at subsidized prices.

168. Despite the current recovery of rice prices Government policy should be based on expectations that real prices of rice will probably decline somewhat from current high levels. To maintain incentives under such conditions a much more positive effort will be needed to reduce transportation bottlenecks, increase the availability of credit and inputs, and to improve marketing efficiency to provide incentives to the large portion of small rice growers who are currently not receiving the full benefits of prevailing market prices.

169. The marketing of smallholder crops, the predominant form of production, is impeded by the complexities of marketing the output of millions of small producers, and moving these goods to market or export through a maze of official and unofficial charges and impediments. At present private traders are impeded from efficient action in these areas by high credit costs and other impediments, and alternative marketing institutions (cooperatives or government agencies) are not well developed.

170. The high costs of marketing (both real and contrived) and the low level of smallholder productivity limit the incentive to smallholders. Major impediments to expanding exports of agricultural commodities arise from the

high costs of domestic and export marketing, and from an absence of quality control in the marketing process.

171. Sustained output increases in agriculture depend upon eliminating some of the most immediate causes for lack of integration of the agricultural market--allowing greater freedom for trade in the private sector, eliminating the excessive charges and duties (official and unofficial) levied on goods movements, and reducing the costs of inter-island shipping and road transport through improved facilities and better management.

172. The system of uniform floor and ceiling prices for rice in all markets and provinces is a major impediment to market integration and regional specialization. It should be modified to permit a more flexible system of prices which encourages rather than inhibits movement of goods.

173. Accurate information on the actual costs of marketing of specific crops and the actual marketing processes are so lacking at present that major surveys of these costs and processes are needed before large expenditures for physical facilities are undertaken.

IV. PROGRAM FOR ACTION

174. The broad objectives to accelerate the pace of development, to distribute the benefits widely, and to improve the quality of life for all Indonesians, will call for an especially important role for agriculture. Although recent dynamic developments in mining, petroleum, industries, construction and services, have produced impressive results and promise continuing high rates of growth; the bulk of the people will only benefit substantially if the agricultural sector can increase its efficiency and expand rapidly enough to provide the basic food and fiber needs of the growing economy, to release manpower for the growing skilled labor requirements in other sectors and to provide a strong internal market.

175. The prospects for increasing efficiency, for opening up new lands and for shifting to higher value production, vary considerably among the different regions and for different crops but on balance the outlook is good. Various studies have pointed out specific opportunities with regard to rice intensification; rehabilitation of sugar; use of more fertilizer; improvement and expansion of irrigation; flood control and drainage facilities; improvement of estate and/or smallholder production of rubber, coconuts, tea, oil palms, establishment of cotton production, etc., which are discussed in detail in the annexes. In addition, the earlier chapters have stressed the significant role of new land development in the past and its even greater role in the future.

176. In quantitative terms, the targets for the future imply an overall growth rate of the agricultural sector of 4.5 percent per year. This assumes a growth rate in rice output of 4 percent per year and an average rate of about 5 percent per year for other crops, livestock, fisheries and forestry. Such a target is feasible but will be difficult to achieve. For most tree crops, livestock and forestry, the relatively long gestation period of investments means that most of the growth in output during the Second Plan period will arise out of investments made in the First Plan or even earlier. Similarly, in the irrigation, drainage and flood control area lags between investment and effective use of the facilities are substantial. However, the record of the past 20 years indicates that spontaneous development of new land has been at an average rate of 2.3 percent per year. Recent sharp increases in outlays for rehabilitation and expansion of transport facilities can be expected to accelerate this rate to some extent, particularly with regard to three centers of likely rapid growth -- Southern Sumatra, South Sulawesi and Southeastern Kalimantan. Hence, it would not be unrealistic to expect spontaneous land development to provide about a 2.5 percent per year growth. A further 2 percent growth can be achieved through various ongoing efforts through intensification and diversification to higher valued crops (largely in Java) but including substantial areas in the Outer Islands where newly opened land is being converted into permanent tree crops and paddy fields.

177. A growth rate of 4.5 percent per year for agriculture would imply a per capita income growth of about 2.6 percent per year, or roughly doubling of per capita farm income in the next 27 years if the trends of the past decade continue (i.e. about half of the increased population remains in agriculture ^{1/}). To achieve an average annual growth in total GNP of 7 percent, the growth rate outside of agriculture would have to be 9.5 percent which would imply a per capita growth rate of 6.3 percent or roughly doubling of per capita nonfarm incomes in 11 years. However, such an increasing gap between farm and nonfarm incomes would tend to accelerate the transfer of labor from agriculture to other sectors and thus raise real per capita incomes in agriculture somewhat above the levels assumed.

178. A higher growth in agriculture could be achieved by accelerating the rate at which additional land, capital and technology are brought into agriculture. However, the 4.5% projected growth rate already assumes continuing high priority to government efforts to further intensify rice production and initiation of specific government programs to assist smallholder development in the outer islands. The possibilities for a higher growth rate will depend to a considerable extent on the incentives provided by government for such development and for initiation of nucleus estate/smallholder developments based on existing as well as new government and private estates.

179. Specific goals for agriculture in Java should continue to emphasize rice during the wet season but much greater stress should be placed on diversification in the dry season to achieve more effective use of water. Although every effort should be made to increase water supply, for dry season cropping, a shift away from rice to corn, oilseeds, pulses and sorghums, would permit a much more effective use of available water supplies. Specific programs for rehabilitating the sugar industry and establishing a viable cotton industry have already been identified and should be given priority. The amounts of land involved are relatively small, need not significantly affect rice targets and would provide substantial savings of foreign exchange. Rehabilitation of smallholder rubber and coconuts also deserve high priority. In the forestry field, Annex 6 contains a number of suggestions for establishing forest industries based on existing teak and conifer resources and initiating a program for afforestation and management of the main water catchment areas and denuded hilly areas. In the fisheries area, a major goal for Java should be to increase both marine and inland production through investments to exploit the resources of the Java sea and raise the productivity and acreage of brackish and fresh water fish ponds.

180. In the Outer Islands, major emphasis should be placed on upgrading the efficiency of smallholder estate crop production and accelerating the rate of new land development. Efforts to raise efficiency will involve developing a minimum package program geared to reach a large number of

^{1/} Assuming a population increase of 2.4 percent per year over the Second Plan period.

smallholders. Critical elements in such a package will include marketing, improved planting materials, and introduction of better techniques (e.g. spacing, tapping, fertilizer use, weed control) and processing centers. To accelerate the rate of new land development capital and management should be sought from all sources. In addition to a new and more vigorous transmigration policy as outlined in Annex 3, every effort should be made to develop closer linkages between the smallholder and estate sectors in providing planting material, technical guidance and processing and marketing facilities. The private sector should be encouraged to undertake new investments and provide management services and processing and marketing functions not only for their own estates but for surrounding smallholders. Government enterprises should also be encouraged to expand their own operations as they become viable and begin to perform services for the smallholders. At the same time, efforts should be made to improve the performance of spontaneous settlers who have been the major source of new land development during the past 20 years. Assistance should be provided in obtaining rights to land, credit to provide better tools and equipment as well as additional power (draft animals and some tractors), technical assistance in developing cropping patterns - in short, many of the elements of the minimum package program for smallholders plus help in accelerating the land clearing/crop establishment process.

181. The key elements of the program outlined above would imply targets of the following order for the Second Five-Year Plan.

Units
(ha)

JAVA

Irrigation, drainage and Flood Control

Ongoing Rehabilitation, River Training and Improvement	800,000
Dry Season Water Supply	
Storage	150,000
Groundwater	10,000
Low Lift Pumping	50,000
Minor improvements and rehabilitation of village systems	500,000

Sugar Development

Rehabilitation	70,000
New Areas	20,000

Cotton Project 100,000

Tea Smallholder Project (Rehabilitation) 25,000

Smallholder rubber, coconuts, coffee and spices 250,000

OUTER ISLANDS

New Land Development

National Plantation Development Body	
Own Staff	50,000
Managing Agents	150,000
Joint Ventures	50,000
PNP's	100,000

Spontaneous Development

Historical rate	1,500,000
Based on <u>Minimum Package</u>	500,000

Livestock Development 150,000

Other Large-Scale Crop Production 100,000

Intensification of Existing Production

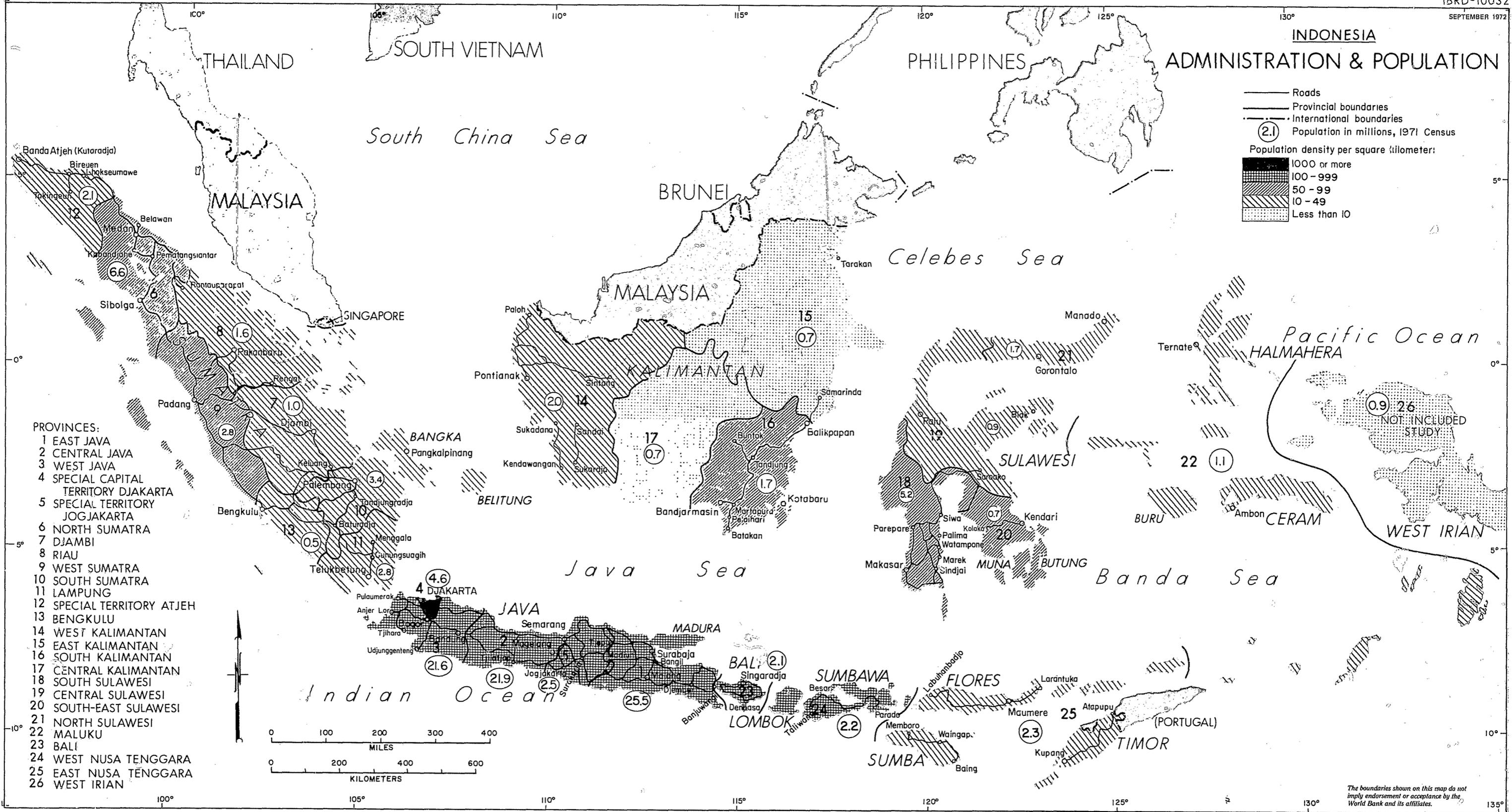
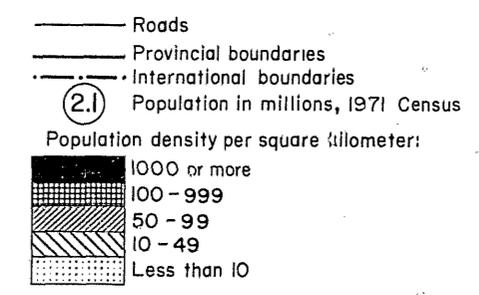
Upgrading Upland to Sawah	650,000
Smallholder replanting	750,000
On Estates	200,000
Improved Irrigation, drainage	450,000

182. The major new element suggested in the program for action is the proposal to step up new land development from the historical rate of 300,000 ha per year with little Government assistance to an average rate of over 500,000 ha over the Second Plan period. At the same time, we are suggesting an ambitious program for upgrading existing smallholders through the development of a "minimum package program". The proposed National Smallholder Development organization would be expected to play a major role in this effort as well as in the development of nucleus estates. It is assumed that much of the task of organizing and managing the effort would depend on active use of foreign consultants and management agencies but the staff of the National Smallholder organization would be expected to undertake from the outset part of the task and to gradually build up its capabilities for handling a growing program.

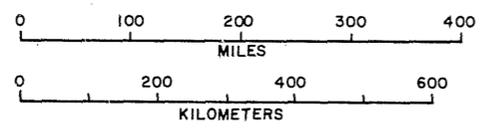
183. Benefits of the new land development program would not fully materialize until the Third Plan period but substantial benefits can be reaped quickly if the development can be closely linked to the exploitation of timber from the clearing process and if surplus crops grown on newly cleared land can be marketed efficiently. Meanwhile, the accelerated program would provide substantial employment possibilities and relieve population pressures on the land in the older established areas.

184. As pointed out repeatedly in the main report and in the Annexes, transport, marketing, and credit will be key constraints. Present efforts to improve and expand inter-island shipping must be greatly intensified and land links between the new development areas and the ports must be improved. Details of the minimum package program will have to be worked out and a number of specific studies must be initiated to select specific sites and farming system and to prepare feasible projects to carry out this strategy.

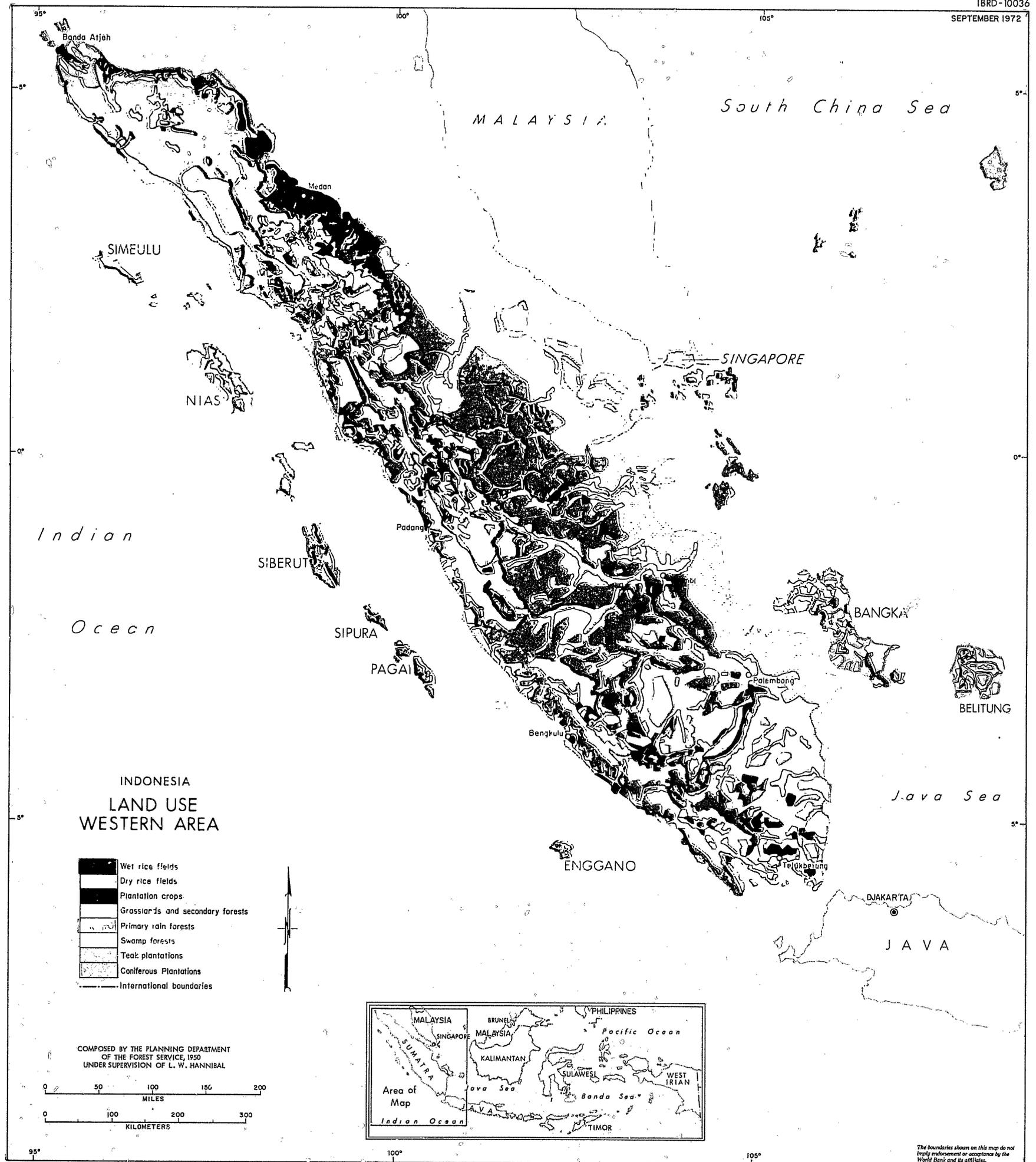
INDONESIA ADMINISTRATION & POPULATION



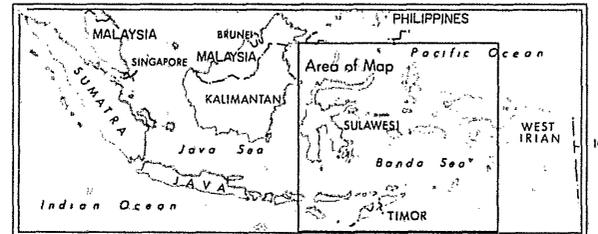
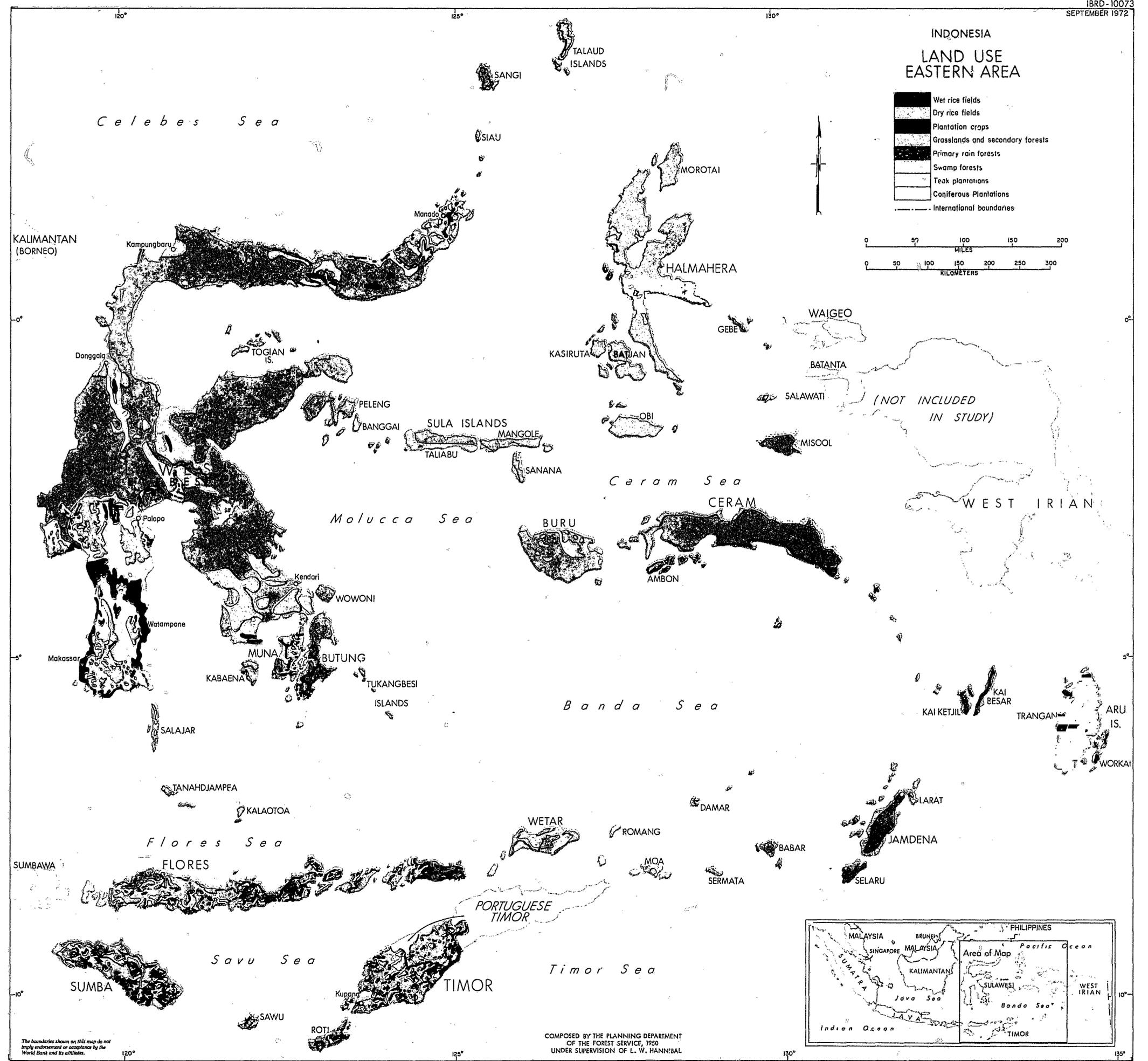
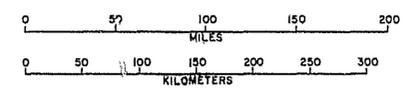
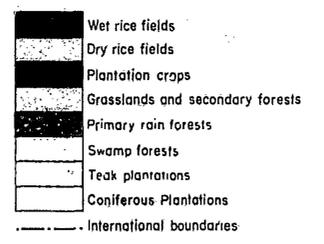
- PROVINCES:
- 1 EAST JAVA
 - 2 CENTRAL JAVA
 - 3 WEST JAVA
 - 4 SPECIAL CAPITAL TERRITORY DJAKARTA
 - 5 SPECIAL TERRITORY JOGJAKARTA
 - 6 NORTH SUMATRA
 - 7 DJAMBI
 - 8 RIAU
 - 9 WEST SUMATRA
 - 10 SOUTH SUMATRA
 - 11 LAMPUNG
 - 12 SPECIAL TERRITORY ATJEH
 - 13 BENGKULU
 - 14 WEST KALIMANTAN
 - 15 EAST KALIMANTAN
 - 16 SOUTH KALIMANTAN
 - 17 CENTRAL KALIMANTAN
 - 18 SOUTH SULAWESI
 - 19 CENTRAL SULAWESI
 - 20 SOUTH-EAST SULAWESI
 - 21 NORTH SULAWESI
 - 22 MALUKU
 - 23 BALI
 - 24 WEST NUSA TENGGARA
 - 25 EAST NUSA TENGGARA
 - 26 WEST IRIAN



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INDONESIA LAND USE EASTERN AREA



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