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A Framework for Regional Planning in Indonesia

(In Three Volumes)

Volume II: Spatial Aspects of the Economy

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CURRENCY EQUIVALENTS

1 US$	=	Rupiah (Rp) 415
1 Rupiah	=	$0.0024
Rp 1 million	=	$2,400
Rp 1 billion	=	$2,400,000

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A FRAMEWORK FOR REGIONAL PLANNING

IN INDONESIA

VOLUME II: THE SPATIAL ASPECTS OF THE ECONOMY

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THE SPATIAL ASPECTS OF THE ECONOMY

CHAPTER I

PHYSICAL GEOGRAPHY

Background

1. Indonesia, the world's second largest unitary state, is also the world's largest archipelago. Straddling the equator, it extends some 3,400 miles (5,110 kilometers) from northwestern Sumatera, west of the Malay Peninsula, to and including West New Guinea (Irian Jaya).

2. The total land area of the more than 3,000 islands that compose the archipelago is some 779,000 square miles (2,020,000 km^2), making it the third largest country in Asia, after China and India.

3. Many of the country's developmental problems arise from its size and from the fact that it is an archipelago. Other problems are to be found in the great diversity of the islands. Thus, a recurrent theme in governmental thinking is that of the need to achieve national unity while respecting socio-cultural diversity related to the great regional differences.

4. Many of these differences reside in the country's geology and climate. Mountainous spines and swampy coasts limit the agricultural potential of many of the islands. In earlier geological periods the eastern and southeastern regions of Asia went through several stages of folding which can be discerned in two long mountain systems which intersect each other in Sulawesi and Halmahera. The first, which is a continuation of the western Burmese chain, runs through Sumatera, Java, Bali and Timor and curves sharply back in a semicircle through the southeastern islands to Ceram and Buru to Sulawesi. The second arc runs southwest from Japan, through the Philippines into eastern Indonesia - hence the complexity of the mountain structure and the peculiar shape of Sulawesi and Halmahera, which have ranges running north-south and east-west.

5. The hills and mountains of Sumatera follow the west coast and are intersected by short but rapid streams which water the narrow western coastal plains; to the east the mountains level out to broad expanses of lowland cut by sluggish streams which run through the interminable marshes to the Strait of Malacca and the Java Sea. In Java, too, the mountains lie close to the shoreline of the Indian Ocean, but, less continuous than those of Sumatera, they allow frequent access from north to south which has facilitated the development of a network of roads and railroads.

Climate

6. The Indonesian climate is tropical, moderated only by the situation of the islands between two large continental land masses and by wide differences in elevation. The climate of the lowlands is marked by heavy rainfall, low winds, high temperature and very high humidity. Because of its position

astride the equator Indonesia has no seasons as understood in the temperate zones; the days and nights are each twelve hours long; there is less than 2°F. variation between the warmest and coolest months, and humidity averages over 80 percent the year round. Temperatures never reach excessive levels; the daily maxima and minima range between 86°F. (30° C.) and 68°F. (20°C.), at the lowest 66°F.

7. Rainfall, although naturally influenced by the mountains and increasing with altitude, is nowhere less than 40 inches (1,016 mm) a year. In the equatorial rain belt which covers most of Sumatera, Kalimantan and Sulawesi, 90 to 100 inches (2,286 - 2,540 mm) annually are regularly recorded. In this region rainfall is fairly evenly distributed throughout the year; cloud covering is often heavy; thunderstorms, frequent. Bogor, south of Jakarta, regularly has thunderstorms on more than 300 days a year. However, there is a progressive lessening of precipitation towards the southern and eastern parts of the archipelago as the rainfall map in the cartographic appendix reveals. The climate is drier in Java, Sulawesi and the Nusa Tenggara Islands than in the larger islands of Sumatera 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 Sumatera of 187 inches (4,760 mm) and Kupang in Timor to the east with 57 inches (1,460 mm). (See Appendix Table A.1.)

8. The wind pattern and the only two recognizable seasons--"wet and dry"-- are determined by the monsoons. The southeast wind carries dry air from the interior of Australia during the "northern" summer, giving a comparatively dry period of about 4 months--June to October--to eastern Java and Nusa Tenggara. At the same time warm, humid air from the Indian Ocean denies relief to Sumatera, western Java and the islands of the equatorial rain belt. During the "southern" summer the direction of flow is from the Asian mainland, south and then southeast to Australia. This northwest monsoon, which lasts from November to March, brings rain to all parts of the archipelago.

9. The amount and distribution of rainfall has marked effects on soil and vegetation. In areas of heaviest precipitation all soluble soil ingredients are dissolved and carried away. This leaching accounts for the generally poor nature of the soils of Sumatera, Kalimantan and Sulawesi and is an important contributory factor to the low population density. Conversely, in central and eastern Java, Bali, Lombok and Nusa Tenggara generally, the dry season gives the soil a respite from the constant leaching. More important still, in areas of volcanic activity the wet-season leaching process is to some degree beneficial since it exposes new, fertile volcanic soil.

Geology and Minerals

10. As indicated by the foregoing, the geology of the Indonesian Archipelago is structurally very complex, the result of various periods of changes of the earth's crust in recent geologic times in which progressive

structural and subsurface or magmatic events 1/ have taken place. Not only has this complexity of mountain structures and a long geological history of active mountain forming processes given form to the country as it is seen today, but it has also endowed it with a great variety and wealth of minerals. The island chain lies along three interface zones: between the Asiatic Shield and the Sunda Shelf to the northwest; the ancient landmass referred to by geologists as the Gondwanaland to the south and west (comprising Australia, the Sahul Shelf, the floor of the Indian Ocean and India); and the massive expanse of the Pacific Ocean floor to the northwest. Mountain forming crustal movements along these three interfaces are extensions of the Alpine-Sunda Mountain System extending from the Himalayas southward through Burma, the Andaman Islands, Sumatera and Java and into the Nusa Tenggara Islands; the East-Asiatic Circum-Pacific System extending southward from the Philippines and then branching off into Kalimantan and Sulawesi; and the Circum-Australian Mountain System extending northwestward from New Zealand through New Caledonia into Irian Jaya and Halmahera. As a result, this part of the earth's crust is still highly mobile as illustrated by active volcanism, frequent earthquakes and strong gravity anomalies. The inner arc of the archipelago from Western Sumatera through Java and into Sulawesi is particularly active as evidenced by more than 500 young volcanoes, 127 of which are still considered active. Seismic activity along the fissures of this portion of the earth's crust is related to the mountain formation process in which the earthquake focus or epicenters are usually located offshore and at great depths, having shock ranges of 300 to 700 kilometers. Volcanic earthquakes are of less importance but, though local in character, can cause considerable damage in a land with a dense population living on steep slopes much of which is composed of poorly consolidated volcanic materials.

11. A study of the crustal movement of the island chain indicates that mountain formation, erosion and sedimentation have taken place over a long period of geologic evolution. Although little is known of the geologic history in Palaeozoic times, much more evidence is available of the newer mountain forming cycles which continued in successive phases throughout the Mesozoic, Tertiary and Quaternary Periods. During the Tertiary a number of complex folded basins were formed in which thick series of marine, lagooned and non-marine sediments have accumulated. This period was followed by another phase of crustal folding which took place at the end of the more recent Pliocene Period. Thus geologically, the archipelago is a relatively young structure, with active mountain building dominating the scene.

12. There is a wide range of igneous rocks each related to a distinct phase of crustal evolution. Mineral deposits in particular, have arisen as a result of magmatic processes in which materials from deep within the earth have been forced outward during the mountain forming cycles. Post-Triassic, granitic batholiths outcrop in the western part of the archipelago and provide

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1/ A magma is a molten rock material within the earth from which an igneous rock results by cooling.

the cassiterite mineral (tin) found in the Riau Islands, Bangka and Belitung as well as wolframite (tungsten) and monazite (phosphate) in varying quantities. The eastward extension of this batholithic mass yields gold, copper, iron, molybdenite, antimonite, zinc and lead in Kalimantan. In the Barisan Mountains of late Cretaceous origin in Sumatera, deposits of iron, lead, zinc, gold and silver are found and nickeliferous iron ore, gold and platinum are found in the Meratus Mountains in southeastern Kalimantan also dating to the same Cretaceous mountain formation period.

13. In the zone of Miocene volcanism in South Sumatera and Western Sulawesi, gold-silver veins are numerous, sometimes accompanied with copper, lead and zinc. Manganese deposits are widely spread in limestone beds lying in or upon the younger Tertiary volcanic rocks. The lateritic iron and residual nickel ore deposits resulting from the weathered gabbro materials of the upper Cretaceous and Lower Tertiary are found along the Timor-Ceram-Sulawesi arc and appear on the island of Waigo and in northern Irian Jaya. The high grade copper deposit at Ertsberg in Irian Jaya and other associated gold and silver deposits also relate to the younger Tertiary igneous rock formations.

14. Related to the long process of sedimentation in the Tertiary basins of complex crustal folding, are potentially rich reservoirs of oil and gas and extensive deposits of coal, only a small portion of which is presently being exploited.

15. In summary, the extensive and widespread mineralization of the island chain can be related directly to the respective periods of mountain formation in various parts of the country. Indonesia possesses vast resources of oil, coal, tin and lateritic nickeliferous iron and low grade nickel ore, and geologic conditions are favorable for the occurrence of additional minerals as well. 1/

16. A summary on an island by island basis of known metaliferous deposits, some of which are being exploited and others which are still being investigated, includes the following:

Sumatera and offshore isles	-	bauxite, bismuth ores, cinnabar copper, gold, iron ore, lead manganese and molybdenite, monazite, silver, tin and zinc.

1/ For further information, see "The Geology of Indonesia" by R.W. Van Bemmelen; "Minerals and Mining in Indonesia" by the Ministry of Mines 1969, and the "Mineral Map of Indonesia" by Dr. Soetarjo Sigit of the Geological Survey of Indonesia.

Java and the islands of Flores, Sumbawa and Timor	-	antimonite, chromite, copper, gold, iron ore, jorosite, lead, manganese, titaniforous iron ore, silver and zinc.
Kalimantan	-	antimonite, bauxite, cinnabar, gold, iron, lead, molybdenite, platinum and zinc.
Sulawesi	-	chromite, copper, gold, iron magnesite, nickel and silver.
Irian Jaya and Halmahera	-	antimonite, chromite, cooper, lead, manganese, nickel, titaniferous iron ore and zinc.

17. Of the mineral fuels, oil is found on all the major islands, coal deposits are found on all major islands except Java and natural asphalt deposits are found on Java, Sulawesi and in Irian Jaya.

18. Non-metallic minerals on an island by island basis include the following:

Sumatera	-	diatomaceous earth, feldspar, kaoline, phosphate, quartz sand, sulphur and talc.
Java	-	clays, gypsum, jorosite, jodine, kaoline, marble, phosphorite, pumice, quartz sand, sulphur and volcanic tuff.
Kalimantan	-	diamonds, kaoline, mica, phosphate and quartz sand.
Sulawesi	-	asbestos, mica and sulphur.
Irian Jaya	-	asbestos, phosphate and talc.

19. Limestones, gravels and other building material are widespread throughout the islands.

20. Much detailed information is available on specific localities in which metallogenic and geologic data are related. 1/

21. The Mineral and Metallogenetic Map published by the Geologic Survey of Indonesia at the scale of 1:2,000,000 (1968) is revised periodically and is included in generalized form in the Cartographic Appendix.

1/ "Mineralization of the Malay-Papua Arc" by J.C. Liddy in Australian Mining, Nov.-Dec. Issue, 1971.

Table 1: AREA BY REGION AND TYPE OF TERRAIN/SOIL TERRAIN/SOIL GROUPS (million ha.)

	Group I		Group II		Group III		Total		
	Total Area	Area with Agri. Potential	Total Area	Area with Agri. Potential	Total Area	Area with Agri. Potential	Total Area	Area with Agri. Potential	Area Present Cultivation
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
Sumatera	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 Meluku	5.7 (38%)	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: Agricultural Sector 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.

Soils and Land Capability

22. Of Indonesia's total land area of 202 million ha, the land resource base for agricultural development is approximately 64 million ha. Of this area only 17.5 million ha 1/ are presently cultivated and some 12 million ha are under forestry concessions. A further 12 million ha. are classified as productive forest reserve. This leaves a potential area for expansion of agricultural activities of some 20 million ha 2/. Almost half of the present agricultural land of Indonesia (viz. 8.4 million ha) is cultivated in Java, which, according to the ASSI team, is well above the agricultural potential. The severity of erosion in various parts of the island of Java and accelerated and irregular flooding are indicative of the fact that cultivation has already proceeded beyond the ecologically suitable level. An unexploited land resource potential of 20 million ha therefore exists in the other islands of Indonesia (See Table 1).

23. The maps on soil, terrain and land use, which are in the cartographic appendix, clearly show the close relation between terrain (elevation) and different soil groups. On the soil map seven different soil groups, each comprising a number of soil types are distinguished and are presented in Appendix Table A 2. The proportion and extent of the three main terrain groups, namely mountainous, gently undulating to hilly or almost flat and swamp land, each characterized by one or more soil groups, provide at the present time the most useful indication of the agricultural potential for regional planning purposes. Table 1 shows that on the average 41% of the land area (excluding Irian Jaya) is mountainous, varying from 69% in Sulawesi to 30% in Java (including Madura and Bali) and to 32% in Sumatera. No more than 10-15% of this mountainous area can be brought into sustained agriculture. Swampy land covers 27% of the land area, varying from 34% of Sumatera, Kalimantan and Java to only 8% of Sulawesi and to 3% of Nusa Tenggara and Maluku. Most of the swampy land in Java is in agricultural use, but in Sumatera not more than 10% and in Kalimantan not more than 20% can possibly be developed for agriculture.

24. The gently undulating to hilly or almost level land covering 32% of the country includes the greatest range of soils, a large number of which are well suited to cultivation with a wide variety of tropical crops. About 80% of this land in Java, Sumatera and Kalimantan is suitable for agriculture, and about 50% in Sulawesi, Nusa Tenggara and Maluku.

1/ This 17.5 million ha is taken from the aggregate of 18.8 million ha of harvested or planted area of the main crops (for 1969/70) as estimated by the National Fertilizer Study.

2/ Agricultural Sector Survey Indonesia (ASSI), Annex 1. (IBRD Report 183-IND.)

25. Appendix Tables A. 3 and A. 4 give a more complete range of soils for the different types of terrain.

26. Since 1960 soil surveys for various purposes like agricultural development, regional planning, transmigration, resettlement or intensification programs have been carried out. Areas from a few thousand to more than 100,000 ha have been surveyed at scales ranging from 1:25,000 to 1:500,000 (Appendix Tables A. 5 and A. 6).

27. The land use map attached to this report is based on a vegetation map which was published in 1950. By 1974 a more up to date medium-scale map of the national land use pattern will be available. The survey which will provide the necessary data for this map has been carried out since 1969 under the supervision of the Director General of Agraria in the Department of Home Affairs (Departemen Dalam Negri).

28. The Land Resources Study and Land Capability Appraisal Project which started in 1972 and will be continued at least until 1978 will provide additional useful information on land suitability for agriculture. The main objectives of the project are, first, collection and interpretation of data to assist the Government in preparing the Repelita II; and second, as a longer term objective, to provide land resource and capability information on a continuous basis as an aid to policy formulation and planning at national and regional levels.

29. With regard to the distribution of forest land by region, forest classification, and the estimated area of the forest plantations by geographical location and species, reference is made to Appendix Table A. 7.

30. For fisheries in the different regions reference is made to Appendix Tables A 37 and A 38.

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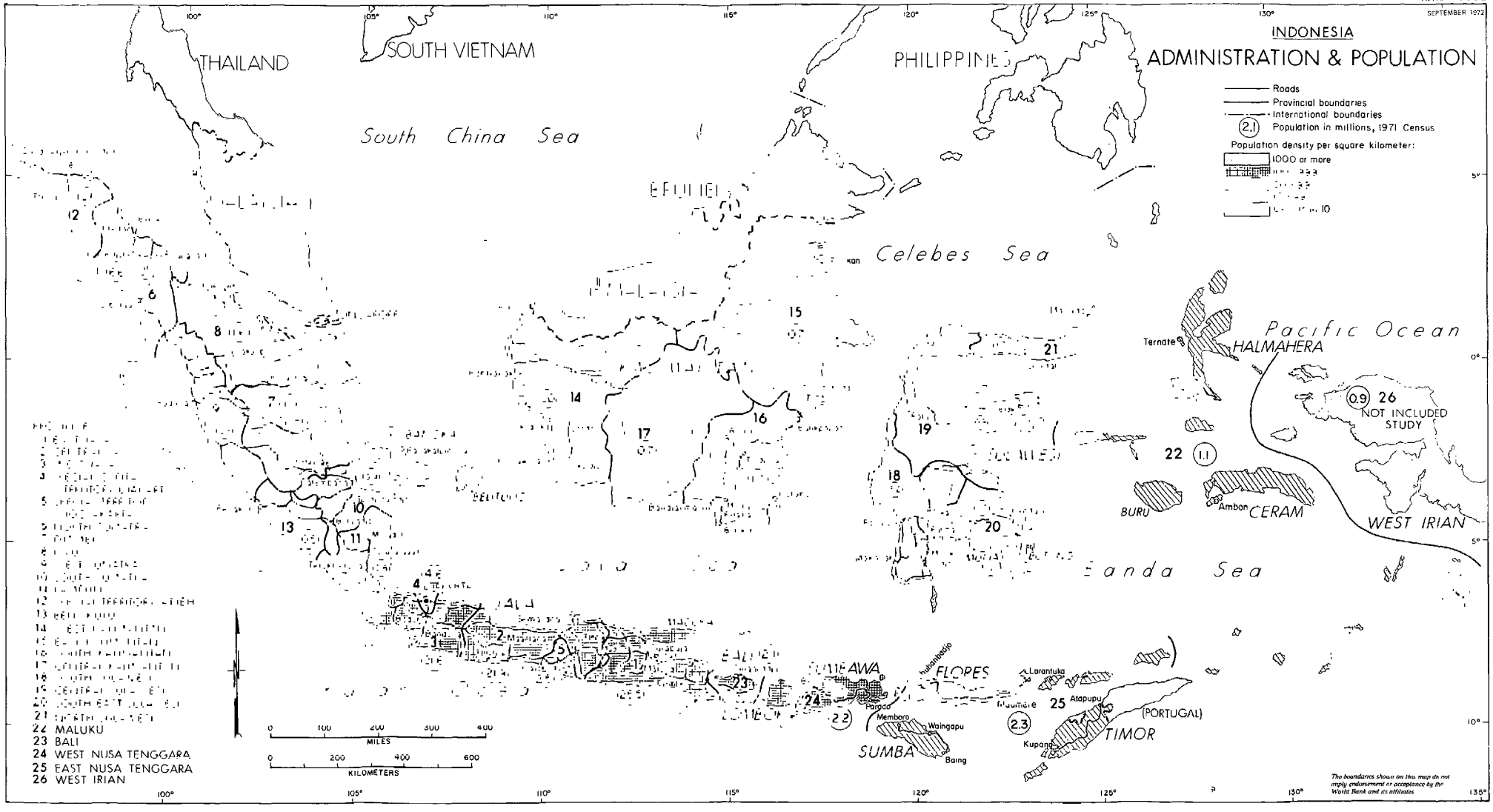
INDONESIA
ADMINISTRATION & POPULATION



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22 MALUKU
23 BALI
24 WEST NUSA TENGGARA
25 EAST NUSA TENGGARA
26 WEST IRIAN

CHAPTER II

HUMAN GEOGRAPHY

Population

31. Indonesia is fifth among the countries of the world in population, exceeded only by China, India, the U. S. S. R. and the United States. Totalling some sixty million in 1930, the number of Indonesians reached double this total in 1971, growing at a rate of 2.26% per annum between 1961 (the date of the first official Indonesian census) and 1971. This growth rate--somewhat slower than had been expected--is a compound of a crude birth rate lying between 43.0 and 48.0 per thousand and a crude mortality rate lying between 21.0 and 23.0 per thousand. It indicates that, if maintained, Indonesia's population will double in thirty years.

32. Neither the population nor rates of growth are evenly distributed over the archipelago, however (see Table 2).

33. Some 64% of the people live on the islands of Java and Madura, which together account for only 6.9% of the total land area of the archipelago, at population densities tenfold those in the Outer Islands, as illustrated by Figure 2. The high rate of population growth and its concentration on the islands of Inner Indonesia 1/, which do not have the capacity to provide more than a minimal standard of living for their inhabitants in agriculture, create serious problems for the government and at the same time provide a vast reservoir of manpower for economic development which has scarcely begun to be tapped.

34. There are also significant differences among the islands in crude rates of natural increase, for while crude death rates today show relatively little spatial variation, crude birth rates are significantly lower where population densities are higher. (See Appendix Table A. 8). These differences, combined with transmigration from crowded Java to the Outer Islands, and rural-to-urban movements within the islands, produce the significant spatial differences in rates of population growth among the provinces and islands that are shown in Table 2. 2/

1/ Java, Madura, Bali and Lombok.

2/ Population census data need to be treated with some caution, as do the employment and national income data which follow (see Chapter III of Volume III), and should be regarded as giving rough orders of magnitude only.

Table 2: POPULATION, 1930, 1961, 1971, AVERAGE ANNUAL GROWTH RATE 1961-1972 AND POPULATION DENSITY, BY REGION AND PROVINCE
(in thousands)

	Area (In sq. Km.)	Census 1930	Census 1961	Census 1971	Growth Rate (percent) 1961/71	Density (persons/km) 1971	Percentage Urban
1. D.C.I. Jakarta	592	811	2,907	4,576	4.6	7,944	100.0
2. West Java	49,144	10,586	17,615	21,633	2.1	440	12.4
3. Central Java	34,353	13,706	18,407	21,877	1.7	634	10.8
4. D.I. Jogjakarta	3,090	1,559	2,241	2,490	1.1	793	16.4
5. East Java	46,865	15,056	21,823	25,527	1.6	539	14.5
Total Java, Madura	134,044	41,718	62,993	76,102(63.8%)	1.9	565	18.0
6. D.I. Aceh	59,904	1,003	1,629	2,009	2.1	34	9.9
7. North Sumatera	71,104	2,541	4,965	6,623	2.9	94	17.7
8. West Sumatera	49,333	1,910	2,319	2,793	1.9	42	17.2
9. Riau	124,084	493	1,235	1,642	3.1	16	13.3
10. Jambi	62,150	245	744	1,006	3.5	51	29.1
11. South Sumatera	104,363	1,378	2,733	3,444	2.2	33	29.1
12. Bengkulu	20,760	323	406	519	2.5	25	11.8
13. Lampung	33,866	361	1,668	2,777	5.2	82	9.9
Total Sumatera	524,097	8,255	15,739	20,813(17.4%)	2.8	38	17.8
14. West Kalimantan	157,066	802	1,581	2,020	2.5	13	12.8
15. Central Kalimantan	156,552	203	497	700	3.5	4	15.7
16. South Kalimantan	33,966	835	1,473	1,699	1.4	49	26.7
17. East Kalimantan	202,619	329	551	734	2.9	4	41.2
Total Kalimantan	550,203	2,169	4,101	5,152(4.3%)	2.3	9	21.8
18. North Sulawesi	24,200	748	1,351	1,718	2.8	71	19.5
19. Central Sulawesi	88,655	390	652	914	2.8	10	8.0
20. South Sulawesi	83,799	2,657	4,517	5,189	1.4	63	18.1
21. Southeast Sulawesi	32,454	436	559	714	2.5	22	7.3
Total Sulawesi	229,108	4,232	7,079	8,535(7.2%)	1.9	37	16.4

(Continued)

Table 2: POPULATION, 1930, 1961, 1971, AVERAGE ANNUAL GROWTH RATE 1961-72
(continued)

	Area (In sq. Km.)	Census 1930	Census 1961	Census 1971	Growth Rate (percent) 1961/71	Density (persons/km) 1971	Percentage Urban
22. Bali	5,623	1,101	1,783	2,120	1.8	377	9.8
23. West Nusa Tenggara	21,740	1,016	1,808	2,202	2.0	101	8.1
24. East Nusa Tenggara	48,889	1,343	1,967	2,295	1.6	47	5.6
25. Maluku	83,675	579	790	1,089	2.5	13	13.3
26. West Irian	421,981	179	758	923	2.0	2	16.4
Total Other Islands	581,908	4,218	7,314	8,529 (7.3%)	1.8	15	9.4
Total	2,019,360	60,593	97,019	119,232 (100%)	2.26	59	17.4

Sources: Biro Pusat Statistik, 1971 Census and Statistical Pocketbook of Indonesia (Jakarta: Directorate of Topography).

Employment

35. While population has been growing at close to 2.3% per annum, growth of the Indonesian labor force and of employment have been much slower (see Table 3). The declining labor force participation rate was most significant among males aged 10-24, presumably as a result of increasing educational opportunities. (An increase from 10.5 to 15.0% in the rate of school attendance by the population age 10 and over corresponds to about 3.6 million students in 1971 or 9% of the labor force.) The shift in population from rural to urban areas where participation rates tend to be lower reinforced the trend while the increases in participation rates of females aged 20-54 (particularly in rural areas) provided only a partial offset. The regional variations in the overall rates are shown in Appendix Table A. 9.

Table 3: POPULATION, LABOR FORCE AND EMPLOYMENT - 1961-1971

	(000's) 1961	(000's) 1971	Average Annual Rate of Increase (percent) 1961 - 1971
Population (10 years and above)	63,954	80,426	2.3
Labor Force (10 years and above)	34,578	40,100	1.5
Employment	32,709	39,210	1.8
LF participation rate (%)	54.1	49.9	
Employment rate (%)	94.6	97.8	

Table 4: EMPLOYMENT BY MAJOR ECONOMIC SECTOR, URBAN AND RURAL AREAS, INDONESIA, 1961-1971

	1961			1971		
	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
			(000's)			
Agriculture, etc.	502	23,014	23,516	600	24,172	24,772
Mining and quarrying	21	66	87	44	46	90
Manufacturing	684	1,172	1,856	661	2,270	2,932
Construction	254	328	582	289	448	737
Transport, communication and utilities	454	289	742	541	413	954
Trade, banking and insurance	880	1,314	2,194	1,539	2,670	4,208
Services	1,422	1,673	3,095	1,856	2,067	3,923
Other and Unknown	81	555	635	266	1,327	1,593
Total	4,298	28,411	32,709	5,796	33,414	39,210
			percent			
Agriculture, etc.	11.7	81.0	71.9	10.4	72.3	63.2
Mining and quarrying	0.5	0.2	0.3	0.8	0.1	0.2
Manufacturing	15.9	4.1	6.0	11.4	6.8	7.7
Construction	5.9	1.1	1.8	5.0	1.3	1.9
Transport, communication and utilities	10.6	1.0	2.3	9.3	1.2	2.4
Trade, banking and insurance	20.5	4.6	6.7	26.6	8.0	10.7
Services	33.1	5.9	9.5	32.0	6.2	10.0
Other and Unknown	1.9	2.0	1.9	4.6	4.0	4.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1961 Census and preliminary sample results from 1971 Census, Biro Pusat Statistik.

36. Details of the sectoral and regional composition of employment and of employment changes are shown in Tables 4 and 5, and Appendix Tables A. 10 - A. 15. The major shift in sectoral shares of employment has been a decline from 72% to 63% in agriculture with corresponding increases in the shares of manufacturing, trade, transport and services (Table 4). Employment in agriculture grew at a rate of only 0.5% a year compared to increases in manufacturing employment in rural areas averaging 6.8% a year and an actual decline in workers employed in urban manufactures (Table 5 and Appendix Table A. 10). In these changes, marked regional differentials can be discerned. Agriculture remains more important in the outer islands, and manufacturing, trade and services in Java (Appendix Tables A. 11 and A. 12). In turn these latter sectors are the predominant growth sectors (Appendix

Tables A. 13, A. 14, and A. 15). In addition to growth of trade, finance and other services in Java's major cities, notably Jakarta, there is evidence of the increasing importance of small scale rural manufacturing activities in Java.

Table 5: AVERAGE ANNUAL RATES AND DISTRIBUTION OF EMPLOYMENT CHANGE BY MAJOR ECONOMIC SECTOR, INDONESIA, 1961-1971

	1961-1971			1961-1971		
	Average Annual Rate of change (percent)			Percent of Total Employment Change		
	Urban	Rural	Total	Urban	Rural	Total
Agriculture, etc.	1.8	0.3	0.5	1.5	17.8	19.3
Mining and quarrying	7.7	-3.2	0.3	0.3	(-0.3)	...
Manufacturing	-0.3	6.8	4.7	(-0.3)	16.9	16.6
Construction	1.3	3.2	2.4	0.5	1.9	2.4
Transport, communication and utilities	5.9	7.3	6.7	1.3	1.9	3.3
Trade, banking and insurance	1.8	3.6	2.5	10.1	20.9	31.0
Services	2.7	2.1	2.4	6.7	6.1	12.7
Other and Unknown	11.5	9.1	9.6	2.8	11.9	14.7
Total	2.8	1.6	1.8	23.0	77.0	100.0

Urbanization

37. According to the 1971 Population Census, 17.4% of the population is defined to be urban in Indonesia; in 1961 the percentage was 14.8. This level of urbanization is one of the lowest even among developing countries, and is consistent with Indonesia's low level of economic development. The 2.6 percentage point increase in the urban population percentage during the period 1961-1971 was much lower than the 5 percentage points during the same period in most regions of the developing world.

38. Despite the large divergences in population density in various parts of the country, the urban population percentage is quite similar among the provinces. (See Table 2). The urban population ranges within a few percentage points of the national average for each of the major regions, with the exception of Nusa Tenggara, which is among the least developed regions in the country, and of course the city-province of Jakarta.

39. Urban areas in Indonesia specialize, as elsewhere in the world, in manufacturing and service functions including trade, transportation, finance and public administration. As shown in Appendix Table A. 16, the percentage composition of employment by sectors is quite similar among the urban areas of all the major regions of the country. As a collorary, the percentage composition of employment is similar among all rural areas. Rural areas are

dominated by agriculture with 60 to 80% of labor force engaged in this sector, whereas urban areas are dominated by trade and service activities. However, rural areas and urban areas are not independent, but are interdependent: rural areas specialize in the production of food crops and other raw materials while urban areas perform trading functions, administrative, financial, educational and other services. Manufacturing can take place in both areas, but rural manufacturing tends to be small scale or handicraft and large establishments tend to concentrate in urban areas.

40. In terms of the growth of employment, urban employment grew at the annual rate of 2.8% while the rural employment grew at 1.6% during the same 10 years (see Table 5). The growth of urban employment was largely due to growth of employment in the service sector including transportation, and the manufacturing employment in urban areas did not grow at all. There was, however, growth in manufacturing employment in rural areas and in the province of West Java outside of Jakarta. Although too much reliance should not be placed on the statistics it would appear that this is a peculiar characteristic of urbanization in Indonesia: urbanization is not supported by the growth of manufacturing, but, more heavily than in most countries, by the growth of the service sectors.

41. The difference in the sectoral compositon of employment is not the sole difference between urban and rural areas. There are marked differences in the educational level between them. People in urban areas are much more educated than those in rural areas in every major region of the country. The illiteracy rate in rural areas ranges from a low of 30% in Sumatera to a high of 51% in East Java, but in urban areas ranges from 16 to 26% (see Appendix Table A. 17). The number of persons who have attended university per 1,000 persons of 10 years of age and over is 0.4 or less in rural areas of every region, but ranges from 0.8 to 12.6 in urban areas, many of the regions having a figure above 5.0.

42. Comparing the distribution of the illiteracy rate with the rate of university attendance, it can be concluded that the concentration of educated people in urban areas is more marked at the highest level of education than at the lowest level of education. Another significant point in the educational composition is that the regional disparity is relatively small at the lowest level of education. Interregional differences in university attendance in urban areas range from one to fifteen per thousand from Kalimantan to Jogjakarta and Jakarta. Urban areas in Kalimantan and Sumatera have relatively low rates of university-educated people.

Economic Wellbeing

43. With some 65% of the population of Indonesia living in Java, the bulk of the country's economic activity--investment, generation of income, trade and commerce--naturally takes place on that island. The concentration of population in a limited space affords certain economies in the use of the economic infrastructure (e.g. roads, irrigation, etc.), but by and large, rather than comparing regional aggregates (e.g. regional income), a comparison of per capita indices gives a better idea of the level of economic wellbeing in different regions.

44. The economies of individual provinces can be compared in various ways, but the most common and easily understood index is the per capita regional income. However, in the case of Indonesia, the data are available only for the gross regional domestic product (GRDP) for eighteen provinces (the most important exclusions being North Sumatera and South Sulawesi), and it is not possible, in the absence of the data on the inter-provincial transfer of resources, to derive an estimate of the income retained in a province. (See Table 6.)

Table 6: PER CAPITA GDP OF SELECTED PROVINCES, 1969 and 1971

	Per Capita GDP in 1969 prices 1969	1971	Percentage Increase of 1971 over 1969
D. I. Aceh	22,529	-	-
West Sumatera	22,542	24,474	8.57
Riau	114,334	128,192	12,12
South Sumatera /a	42,294 /b	-	-
D. K. I. Jakarta	51,410	55,845	8.63
West Java	16,363	18,817	14,85
Central Java	17,319	17,938	3.57
D. I. Jogjakarta	17,980	-	-
East Java	20,156	21,279	5.57
West Kalimantan	25,317	27,311	7.88
South Kalimantan	21,692	27,471	26.64
North Sulawesi	26,192	29,578	12.93
Central Sulawesi	11,103	12,116	9.12
Southeast Sulawesi	13,415	-	-
West Nusa Tenggara	14,796	15,271	3.21
East Nusa Tenggara	11,222	11,510	2.57
Maluku	22,434	-	-
Irian Jaya /c	1,296	1,353	4.40

/a From LEKNAS/KYODAI, The Regional Economic Survey of the Province of South Sumatera.
/b 1970 in current prices.
/c In West Irian Rupia.

Source: Central Bureau of Statistics.

45. Most productive activities create income which accrues mainly to the inhabitants of the region in which they are located. In certain sectors, however, outward factor payments and/or income transfers leave only a relatively small part of the value added within the region concerned. In the absence of reliable information about the magnitude and destination of such factor payments and transfers, it appears that for provinces where such sectors are particularly important the exclusion of their value added from the income comparisons will lead to a smaller distortion than inclusion of them. The major sector in Indonesia to which the above applies is mining, and especially oil, and it is particularly important for Riau. If this

adjustment is made to the 1969-71 data, the most prosperous province is seen to be Jakarta Raya, with an average per capita GRDP of more than Rp 50,000. The urban character of this province and the fact that it is the country's capital account for this high level. The second richest province, even after taking out oil revenues, appears to be Riau (Rp 48,000). In this case the secondary effects of the oil activities probably are a major contributing factor, though its close proximity to Singapore may have also some influence.

46. Half of the provinces for which the regional product data are available indicate a per capita GRDP falling in the range of Rp 20,000-25,000 (about $50-65), which in view of the large margin of error in estimation, does not appear to be a large range. This group of provinces consists of Jogjakarta, East Java, Aceh, West Sumatera, Lampung, West and South Kalimantan, Maluku and Irian Jaya, 1/ and accounts for 40% of the population. While the per capita regional product of North Sulawesi was a little above this range (Rp 28,000), that of West and Central Java was a little below the range (Rp 18,000).

47. The poorest provinces comprise Central and Southeast Sulawesi, and the two provinces of Nusa Tenggara, whose per capita GRDP ranges about Rp 10,000-15,000 ($24-$37). The share of agriculture in the regional product of these provinces is typically high, ranging from 60-70% compared to the national average of about 50%.

48. The composition of the GDP differs significantly among the listed provinces (see Table A. 18). Excluding the special provinces of Jakarta and Jogjakarta, the share of agriculture in the regional product ranges from 11% for Riau to 75% for Maluku, but in most cases it exceeds 50%, the approximate national average. Variation in the shares of manufacturing and mining sectors is even greater. The most industrialized provinces, i.e. those whose share of manufacturing is 10% or more, are the provinces of Java (other than Jakarta), Aceh and West Kalimantan. Contrary to the common impression, the 1969-71 data do not show Jakarta Raya to have an unusually large manufacturing sector, for it accounts for only 9% of the regional product. This is partly because such sectors as trade, banking and insurance dominate in this special province, but partly also because most of the recent manufacturing establishments have been set up just outside of the limits of Jakarta in what is actually the province of West Java.

49. Food grain production and consumption is another indicator of the relative economic wellbeing enjoyed in the different parts of the country. Java is the main source of food grains, while Sumatera and Kalimantan, are

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1/ The estimates for Irian Jaya were converted to the national currency on the basis of one Irian Jaya rupiah equal to Rp 16, derived as a weighted average of the exchange rates existing during 1969-71. Since 1971, the monetary system of Irian Jaya has been more closely integrated with the rest of the country.

the main producers of the country's major non-oil exports--rubber, timber and coffee (Appendix Table A. 19). Some seven million tons of rice was produced in Java in 1971, compared to three million tons in Sumatera and one million tons in Sulawesi. However, in terms of production per head of population, the amount of rice produced in Java was about 90 kg., compared to 140 kg. in Sumatera, 125 kg. in Sulawesi and 118 kg. in Kalimantan. Similarly production of maize in Java, while amounting to a little under 75% of the country's total, was 25 kg. per capita compared to around 35 kg. in Bali, Nusa Tenggara and Sulawesi.

50. A comparison of the apparent consumption of rice in various provinces shows that inter-regional trade or foreign imports of rice reduce only moderately the rather large variations in rice consumption resulting from the local availability of rice. The consumption of rice in Nusa Tenggara, Maluku and Irian Jaya averages 35-50 kg. per person per annum, while that of Aceh exceeds 200 kg. The former tend to supplement their diet with generally inferior substitutes of rice, such as maize, cassava, sweet potatoes and yams. 1/

51. On the whole, rice consumption in Sumatera is estimated to be substantially above the national average (to a lesser extent this is also the case for Kalimantan) while consumption in Java due to the large weight of its population is close to the national average of 106 kg. The main rice surplus areas are East Java and South Sulawesi, which in 1971 exported 142,000 tons and 66,000 tons, respectively, to other regions. The main rice deficit areas are West Java (including Jakarta), South Sumatera and North Sulawesi.

52. Economic wellbeing at least for the bulk of the population in different regions, can also be compared through wage rates in different provinces, if possible making due allowance for the differences in the cost of living. The data on regional wage rates for various classes of workers were compiled by Bappenas from the public works projects and are given in Appendix Table A. 19. Unfortunately, except for certain urban centers, no regional cost of living index is available to correct the money wages for the varying costs of living across the country. The indications are that the cost of living differences are relatively small in Indonesia and the wide variations observed in the wage rates would only be reduced somewhat, but not removed, if an allowance were made for such differences.

53. Generally, the wage rates for the different classes of workers display a uniform pattern across the provinces: areas with relatively low (or high) wages for one category of labor tend to have low (or high) wages in other categories also. On an average, the provinces in Kalimantan, particularly East Kalimantan, have the highest wage rate, while labor is cheapest in Java. Even skilled workers in Java, with the exception of Jakarta, earn much less than the unskilled workers of Kalimantan (excluding

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1/ Inferior with respect to consumer satisfaction, not necessarily in terms of nutritional content.

South Kalimantan). Wage rates in Sumatera and Sulawesi fall in the intermediate range.

54. Whilst the observed differences in the wage rates among the islands are perhaps not larger than one would expect in a country as large as Indonesia, it is noteworthy that within the islands also the labor market is far from being perfect. In certain cases, wage rate differentials among the same category of workers within an island are close to 100%. Thus, for example, the daily wage rate of an unskilled worker in Central Java is Rp 95 compared to Rp 155 in West Java, Rp 168 in Aceh, Rp 200 in Jakarta and South Kalimantan, Rp 308 in Riau and Rp 375 in East Kalimantan. This is an indication of rather serious impediments to labor mobility not only between but also within the islands.

55. To the extent that the Government revenues are related to the economic capacity of a region, these data also are a good indication of the relative well-being of the regions. The non-oil central government tax receipts have risen very rapidly in recent years, more than doubling in the last four years (see Appendix Table A. 20). These revenues appear to have risen fastest in regions which were seen above to be relatively less well off, i. e. in the provinces of Java, Sulawesi, Irian Jaya, etc. However, despite this rapid growth, the per capita collection for these areas (except Metropolitan Jakarta) are less than half of those of the provinces of Sumatera and Kalimantan. The very high tax collections of Jakarta Raya are partly due to a much higher level of income but partly also because many of the corporations and public enterprises which are shown as paying the tax have their headquarters in Jakarta.

56. A rather mixed picture seems to emerge from the above comparisons of the different economic indices, approximate though they may be. It does, however, seem fairly clear that on average the populations of Sumatera and Kalimantan are somewhat better off than those of Java, Sulawesi and other islands. It is noteworthy that there were observed to be fairly wide variations in the economic wellbeing within as well as among the main islands. Even when Riau and Jakarta are excluded as special cases, and allowance is made for the poor quality of data, the regional income differentials seem to be quite significant. Certainly, consistent with findings elsewhere, the higher the income the greater the level of provincial urbanization (see Appendix Table A. 21).

Regional Discrepancies in Educational Development

57. Differences in enrollment rates among provinces are considerable and as suggested earlier, follow a fairly regular pattern: provinces that have a higher share of their population concentrated in urban areas obviously enjoy economies of scale and hence a lead over the other provinces. Apart from the two urban areas of Jakarta and Jogjakarta, this group includes North and West Sumatera and North and South Sulawesi. Regional per capita income plays a supporting role in determining the level of educational expansion, and has an influence on the quality of local education systems.

Not unexpectedly, differences increase as one moves up the educational ladder. Net enrollment rates per thousand range:

(a) in primary education from 52 (West Kalimantan) to 84 (Jambi and Lampung);

(b) in lower secondary education from 5 (Irian Jaya) to 25 (Riau and Jogjakarta);

(c) in upper secondary education from 3 (Irian Jaya) to 24 (Jogjakarta).

In higher education the extremes are still further apart, but one should be mindful of the fact that in Indonesia as elsewhere universities (particularly the larger and better ones) have catchment areas that far exceed provincial or regional boundaries. (See Appendix Table A. 22).

58. Differences in budget allocations are also considerable but do not follow exactly the same pattern. Maxima and minima for recurrent expenditure per pupil in 1971 were:

in primary education: Rp 3,494 and Rp 1,148;

in lower secondary education: Rp 14,634 and Rp 4,365;

in upper secondary education: Rp 27,742 and Rp 4,595.

59. Regional differences in income levels are important influences on the foregoing differences. This happens mainly in two ways: firstly, teacher salaries allow for cost-of-living differences, and secondly, school fees (65% of which are retained by the levying school) distinguish three areas (high-, medium- and low-cost) and are furthermore based on parents' income. Since high- and medium-income families are concentrated in the first two areas, these two factors tend to reinforce one another. The remaining 35% of the fees are redistributed by the provincial authorities, mainly according to the urgency of local needs, and thus would appear to have an--albeit limited--equalizing effect.

Health and Family Planning

60. Looking at the figures of the number of doctors and paramedical personnel per head of population in each of the Provinces, one would be tempted to draw the conclusion that differentials have not contributed to the relative backwardness and poverty of some of the Provinces, particularly the outlying islands, but these figures should be treated with caution. The distribution of medical personnel, hospital beds and clinics within Provinces is uneven. In low population density areas the medical facilities are largely concentrated in the towns and people in the rural areas have to travel long distances to receive medical attention. This is not unexpected because of the higher costs of providing services in low density areas, and the same pattern is evident even in well developed countries.

61. The Government is aware of this problem and has been trying to rectify it by requiring graduating doctors to spend three years practicing in the Provinces. But this requirement has been extensively evaded and moreover, it is not sufficient to specify the poorer Provinces: it is necessary to have a further condition which will ensure that the rural as opposed to the urban areas are served and rural clinics etc. provided.

62. There are 25 medical schools of one kind or another in Indonesia, but only 5 of these--in Jakarta, Surabaya and Bandung in Java, Bali and Ujung Pandang--are regarded as "Supervising Medical Schools", giving their own degrees. Before medical students can graduate from the other medical schools they must sit and pass a national test which is set by the Supervising Medical Schools; and the standards of this test are fairly high.

63. There is both a national shortage and a maldistribution of nurses, particularly midwives. At present, there is one midwife per 45,000 people in Java-Bali, whereas there is only one midwife per 80,000 people elsewhere in Indonesia. These figures compare very unfavorably with the optimum figure given by the medical profession of one midwife per 3,500 people.

64. There are good smallpox vaccination and malaria control programs in most parts of the country, but the T. B., leprosy and yaws programs suffer from being uncoordinated with the rest of the medical services, resulting in a sub-optimal use of the existing facilities. The public health services are particularly weak, there is a shortage of sanitarians and the training of sanitarians needs to be improved.

65. Indonesia has started a modest family planning program, and it is making fair progress in Java and Bali, where it is most needed, but it has made a slow start in Lombok which is badly in need of an effective program. The support of the Moslem religious leaders is probably essential for the Lombok program to make better progress.

Transmigration

66. In the framework of the differences in economic wellbeing, population growth and sectoral shifts in employment are taking place. An important component of the accompanying factor mobility is migration, of which there are two streams: the drift to the cities (an important source of urban growth) and "transmigration" (i. e., interisland movements).

67. Unfortunately there is distressingly little information about the recent movement of population. Consumption data suggest that there should indeed be rural-to-urban and Java-to-Outer Island movements in search of better opportunities (Appendix Table A. 24), and 1961 and 1971 census figures do reveal some significant differences in population growth rates between regions consistent with this view, but they are insufficient to produce large changes in the regional distribution of population within the next decade or two. Aside from Jakarta, only East Java showed a decrease and Sumatera an increase of as much as one percentage point in share of population. A crude effort to calculate net movement of population between census

years (Table 7) shows quite low interregional net migration rates with only the indicated net outflow from Central Java and the net inflow into Sumatera amounting to as much as 0.4% per year.

68. While little credence can be given to the specific estimates of net population movements, they do provide an indication of the probable orders of magnitude as well as the general pattern of net interregional flows generally consistent with impressions and estimates based on other types of evidence. For example, although no records are kept of interinsular migration, indications can be found in surveys of passenger traffic on the main Java-Sumatera ferry, data on organized transmigration and population censuses. One analysis of these various elements, covering the period 1960-64, estimated the annual flow out of Java at 112,000 migrants and the annual flow into Java at 59,000 in these years (40% to Jakarta), thus showing a net outflow of 53,000. More than half of the gross outflow consisted of spontaneous migrants, the remainder being government financed civilian or veteran settlers and contracted estate workers.

Table 7: A ROUGH ESTIMATE OF NET MOVEMENTS OF POPULATION BETWEEN REGIONS, 1961-1971

	Estimated /a Natural Rate of Population Increase	Actual Rate of Population Increase	Implied /b Net Movements of Population 1961-1971 (000's)	
			In	Out
DCI Jakarta	2.1	4.6	996	269
West Java	2.2	2.1		785
Central Java	2.1	1.7		85
DI Jogjakarta	1.4	1.1		303
East Java	1.7	1.6		
Sub-Total:				
Java and Madura	2.0	1.8		446
Sumatera	2.4	2.8	870	
Kalimantan	2.1	2.2	57	
Sulawesi	2.2	1.9		265
Other Islands	2.0	2.0		215
Indonesia	2.0	2.0	0.0	0.0

/a Derived from natural rates for 1961 estimated by M. Iskander as reported in IBRD, Population Projects Report No. PP8a, February 28, 1971.

/b Assuming no net movements between Indonesia and abroad.

It should be noted that, in 1963 and 1965, an unusually high number of people were moved following natural calamities: 32,000 people in 1963, mostly from Bali and 53,000 in 1965, of which half from Central Java.

69. More recently the real presumed employment possibilities in Jakarta, Surabaya and some other towns on Java have continued to attract people from the Outer Islands; the number of civil servants has not risen greatly since 1966, but this may have been compensated by growing employment for skill-requiring jobs in the private sector. On the other hand, the improved conditions in rural Java have probably reduced the number of departing spontaneous settlers. For other reasons (budget restrictions and a desire to promote more successful but costlier settlement schemes), the number of organized civilian settlers was reported as only 12,000 people (2,700 families) per year during 1966-71, versus an average of nearly 20,000 people (4,700 families) during 1960, 1961, 1962, 1964. Recruitment of estate labor slowed down considerably after 1966, and the last few years show that returning laborers exceed the number of new recruits. On the other hand, the rapid development of forest exploitation occurring in the last few years has required a considerable number of additional laborers of whom most have come from Java.

70. Some scattered indications about the aggregate of these different movements can be obtained from recent studies of interinsular shipping in the ten major ports, and of the Java-Sumatera Ferry (Appendix Table A. 25). These data show a substantial and growing net inflow into Sulawesi in the late 1960s. For Bandjarmasin (South Kalimantan) figures on incoming and outgoing passengers were more or less equal, but other Kalimantan ports--not covered by the studies--must have recorded a sizeable net inflow, namely labor for the logging industry. Data for the Sumateran ports, other than Lampung, show a persistent net passenger outflow of several thousands, probably to Java.

71. The lion's share of interinsular passenger traffic is performed by the Java-Sumatera Ferry. Data are only available for 1968 and 1970, but these are reported to be representative for at least the last ten years. They show a large net outflow from Java to Lampung along this route.

72. The incompleteness of the data is shown by several inconsistencies: for instance, the net inflow into Sulawesi in 1968 and 1969 does not correspond with a net outflow from Java. Nevertheless, it may be a fair conclusion that in recent years there has been a net outflow of population from Java to the Outer Islands of some 35-50,000 people per year, mostly to Lampung and Sulawesi.

73. The most complete data relate to official transmigration, the organized migration of people from Java to the Outer Islands. It covers not only settlement schemes for landless or near landless Javanese farming families, but also workers recruited by the estates, forestry enterprises and mines in the Outer Islands. These activities are organized and/or carried out by a number of private and public institutions, of which presently the most important--in terms of people migrating--is the Ministry of Transmigration and Cooperatives (TRANSKOP). This ministry sets up settlement schemes with the help of a number of other government agencies, and recruits labor for employment by private or public companies, with the exception of estate labor, for which the Directorate General of Estates in the Ministry

of Agriculture is responsible. Settlement schemes are also set up by the Ministry of Defense, by the University Diponegoro (Semarang) (about 100 families per year) and by the Catholic and Protestant Churches (200-300 families per year). The University of Indonesia (Jakarta) organizes the transmigration of some 100-200 skilled workmen per year to the Outer Islands.

74. It will be useful to distinguish between transmigration of estate and forestry labor on the one hand, and settlers on the other. The flow of Javanese workers to the estates in the Outer Islands has dropped considerably below prewar levels, but there is no precise information on the net flows prior to 1967. Appendix Table A. 26 shows the available data for North Sumatera (including Aceh). They show that at least since 1968, there has been a small net outflow of labor from the estates. While this outflow is not important in comparison with the total number of unskilled permanent laborers in Sumatera (about 120,000), it may well become so, if the present drive to increased labor productivity in the government estates is translated into a labor force reduction rather than output increase.

75. The rapid expansion in logging operations in Kalimantan and Sum. has required a growing number of laborers. Data on this type of labor are not available, but an estimate can be made on the basis of output figures. Assuming that one man produces about 400 m^3/year, logging operations may have attracted, between 1966 and 1972 an additional 36,000 men, mostly from Java. To this must be added a considerable number of traders, artisans and others to provide services to forestry laborers, who, incidentally, mostly have come without their families.

76. The establishment of Javanese peasant farmers on unoccupied land in Southern Sumatera began in the early part of this century. The objective was to alleviate the population pressure of some regions in Java. At the outbreak of World War II, some 200,000 people (about 40,000 families) had been settled.

77. Settlement activities were resumed in 1950. The objectives changed considerably, with emphasis on Indonesianization (assimilation of Javanese with other ethnic groups) and, later, on defense considerations. However, the approach in terms of recruiting policy, organization of the schemes and benefits received by the settlers remained largely the same. Table 8 shows the number of transmigrants handled by government agencies over the past two decades. Considering that activities of private organizations and that veteran settlers are not included, the actual figure for 1950-71 may be close to 150,000 families (600,000 people), not including an unknown number of spontaneous settlers. However, this number pales alongside the 1.5 million annual population growth in Java.

Table 8: NUMBER OF TRANSMIGRANTS SETTLED SINCE 1950

	Number of Families		Number of People	
1950/51	790		2,954	
1952	3,885		17,605	
1953	10,141		40,009	
1954	8,409		29,638	
1955	5,491		21,389	
1956	6,091		25,549	
1957	4,968		23,201	
1958	4,799		20,603	
1959	11,439		46,096	
Total 1950-59		56,013		227,044
1960	5,622		22,075	
1961	5,165		20,548	
1962	4,874		22,003	
1963	7,692		32,159	
1964	3,440		14,361	
1965	13,296		53,362	
1966	1,148		4,648	
1967	1,312		6,166	
1968	2,991		13,742	
1969	1,881		7,934	
Total 1960-69		47,421		196,998
1970	4,377		19,696	
1971 /a	4,727		20,954	
1972 /b	14,700			
Total 1950-71		112,508		464,692

/a Provisional.

/b Planned.

Source: Ministry of TRANSKOP.

78. There are no data on the number of settlers that have returned to Java. It is often said that returns have been substantial and that the net effect of settlement transmigration was negligible. There are several factors deterring settlers from returning:

- The shipping data, referred to above, indicate a consistent and considerable net outflow out of Java.

- Even if settlers wanted to return to Java, they would, in most cases, not be able to do so, because they would not have the means to pay the return trip.

- Further, they would lose whatever small living base they have in the scheme without finding a livelihood in their village of origin.

- According to a recent study of settlement schemes in Lampung, few settlers would wish to return to Java inspite of the difficulties encountered.

79. The fact that relatively few settlers have returned to Java does not mean that settlement transmigration has been an overall success. In many cases, settlers have moved out of the scheme to places with better soil conditions; in other cases the scheme did not allow them to raise their material living standards much above those in Java, while their nonmaterial conditions probably deteriorated.

80. The objectives of the Government's settlement policy, as stated officially, have not always been reflected by the actual transmigration activities. For instance, assimilation between Javanese and other ethnic groups in the Outer Islands has long been an objective, but settlement schemes were set up in such a way that there was little contact between the settlers and the autochthons. Also, in quantitative terms, targets have been at variance with realizations. The first Five Year Plan called for a program of 100,000 families, but by the end of the plan period less than 30,000 families will have been moved. The basic reason for this discrepancy is that the Ministry of TRANSKOP has had to rely almost entirely on other agencies for carrying out its program. Table 9 shows the plans for 1972/73.

Table 9: PLANNED TRANSMIGRATION IN 1972/73, BY PROVINCE
(number of families)

Lampung	5,850
Bengkulu	800
South Sumatera	3,150
Jambi	700
West Kalimantan	300
Central Kalimantan	600
South Kalimantan	300
East Kalimantan	300
North Sulawesi	500
Central Sulawesi	600
South Sulawesi	800
Southeast Sulawesi	700
Maluku	100
Irian Jaya	100
Total	14,700

Source: Ministry of TRANSKOP.

81. The regulations of the Ministry of TRANSKOP limit recruitment of prospective settlers to Java, Madura and Bali. There is a case to include all of the Nusa Tenggara Islands: except for Lombok the population density in these islands may not be as high as in Java, but the natural conditions are such that the people there are economically worse off than many in Java.

82. Since 1950, most settlers have been recruited in Central Java (46%) and East Java (27%). These are the provinces with the lowest rural income levels, the highest underemployment, and the most unfavorable land/man ratios. The recruitment agencies in these areas are flooded with requests from applicants. The Directorate General of Transmigration estimates the number of unfilled requests at least at 200,000 families, but there are undoubtedly a great number of people interested in leaving who do not bother to apply, knowing their chances are slim. This situation enables the TRANSKOP authorities to be quite selective in their recruitment.

83. Main criteria for selection of applicants concern agricultural skills. After having been proposed by the village chief, applicants must pass some sort of examination in farming knowledge. Other criteria concern the age, political background, family status and health of the applicant. Unlike the recruitment of estate labor, these is no limit on the number of dependents a prospective settler may take along.

84. The location of the schemes is obviously determined by the availability of suitable land. So far, "suitable" has meant irrigable, as the schemes were destined to provide each family with 2-2.5 ha of sawah land. An equally important consideration is the accessibility of the land. In many schemes, isolation prohibits (or lowers the revenue of) the sale of a marketable surplus and reduces the scope of further development.

85. In most cases, the settlement schemes are located on government-owned land. But much of this land is not sufficiently suitable for agricultural purposes--and even less for irrigation. Consequently, the authorities have in several instances had to acquire land owned by margas (best translated by "clan") against payment. The land thus retained has tended to be poor and less accessible. The difficulty in obtaining land for settlement is one of the reasons why development of the extensive and vacant swamp areas of Sumatera and Kalimantan has received major attention in the last few years.

Migration and the Growth of Jakarta

86. Although the population census, particularly as related to city population, is not free from skepticism, the statistics show that only Jakarta and Surabaya, the two largest cities in the country, have grown with a substantial amount of net migration among the eleven largest cities (see Table 10). The growth of other large cities was meagre. Many have grown more or less in line with the natural rate of growth, and some, such as Ujung Pandang (Makassar), Surakarta and Jogjakarta had had net outmigration from 1961 to 1971.

87. The growth of a city reflects the growth of the economy in the region. Jakarta grew largely due to the expansion of administrative, trade and manufacturing activities and Surabaya due to the growth of manufacturing and trade. Medan grew in response to the rapid growth of North Sumatera which is based on estate agriculture; Banjarmasin on the phenomenal expansion of forestry extraction in South Kalimantan. The slow growth of cities in the central part of Java including Bandung, Semarang, Jogjakarta and Surakarta is due to the stagnation of agriculture and large and medium size manufacturing in that part of Java. In addition, recent development policies for freer trade and international transactions have evidently favored the expansion of cities having direct access to sea and, in particular, those with a favorable port.

Table 10: POPULATION GROWTH OF CITIES OVER 250,000

City	Location	Population in 1000's 1961	Population in 1000's 1971	Annual Rate of Growth %
D.K.I. Jakarta	Jakarta	2,971	4,576	4.4
Surabaya	East Java	1,008	1,556	4.4
Bandung	West Java	973	1,202	2.2
Semarang	Central Java	503	647	2.5
Medan	Sumatera	479	636	2.9
Palembang	Sumatera	474	583	2.1
Ujung Pandang	Sulawesi	384	435	1.3
Malang	East Java	341	422	2.2
Surakarta	Central Java	368	414	1.2
Jogjakarta	D.I. Jogjakarta	313	342	0.9
Banjarmasin	Kalimantan	214	282	2.8

Source: Central Bureau of Statistics.

Table 11: THE DISTRIBUTION OF THE ORIGIN OF MIGRANTS INTO JAKARTA AND THE PROPENSITY OF MIGRATE DURING 1961-1971

	Province	(1) Population in 1000's 1961	Migrants into Jakarta during 1961-1971 (2) Persons /a	(3) %	Migrants per 1000 persons of Provincial Population (2)/(1)
1.	DKI Jakarta	2,970	-	-	-
2.	West Java	17,673	816,400	43.04	46.2
3.	Central Java	18,456	487,657	25.71	26.4
4.	D.I. Jogjakarta	2,247	65,264	3.44	29.0
5.	East Java	21,880	127,112	6.70	5.8
6.	D.I. Aceh	1,636	9,518	0.50	5.8
7.	North Sumatera	4,984	65,484	3.45	13.1
8.	West Sumatera	2,330	72,873	3.85	31.3
9.	Riau	1,240	14,584	0.76	11.8
10.	Jambi	748	7,594	0.40	10.2
11.	South Sumatera)		57,700	3.04)	
12.	Bengkulu)	4,865	4,773	0.26)	15.5
13.	Lampung)		12,557	0.66)	
14.	West Kalimantan	1,578	23,789	1.25	15.0
15.	Central Kalimantan	499	1,492	0.07	3.0
16.	South Kalimantan	1,479	9,116	0.48	6.2
17.	East Kalimantan	553	5,757	0.30	10.4
18.	North Sulawesi)	2,012	16,962	0.89)	10.7
19.	Central Sulawesi)		4,474	0.23)	
20.	South Sulawesi)	5,097	32,935	1.73)	7.0
21.	Southeast Sulawesi)		2,843	0.14)	
22.	Bali	1,790	5,133	0.27	2.9
23.	West Nusa Tenggara	1,814	23,789	1.25	13.1
24.	East Nusa Tenggara	1,971	5,696	0.31	2.9
25.	Maluku	793	9,499	0.50	12.0
26.	Irian Jaya	761	3,963	0.20	5.2
27.	Abroad		29,919	1.57	-
	Total		1,896,703	100.00	

/a Suharso, "Cityward Migration and Educational Attainment in Jakarta-Indonesia", UNESCO/PDEP/7-1, September 1973.

Source: Central Bureau of Statistics and Suharso.

88. The growth of Jakarta deserves special attention. According to analysis by Suharso 1/ based on 1971 population census, nearly 2 million persons migrated to D. K. I. Jakarta during the period of 1961 to 1971 (see Table 11). Of them, 43% came from West Java and another 36% from the rest of Java and Madura. As shown in the fourth column of Table 11, the propensity to migrate to Jakarta (migrants per 1,000 persons of provincial population) is extremely high in West Java which is explainable by geographical proximity. Jogjakarta and Central Java have also high migration propensities, which are, however, less than that of West Sumatera. The migration propensity of East Java is among the lowest. Some geographically distant areas such as West Nusa Tenggara, Maluku and North and Central Sulawesi also have relatively high migration propensities. Only short distance migration is influenced by geographical proximity. The high migration propensities from West and Central Java and Jogjakarta are probably due to a "push factor", the relative poverty of the areas, whereas East Java's relatively low propensity to migrate to Jakarta appears to be due to its relatively high income (see Table 6) and having another competing growth pole, Surabaya, within it. On the whole, the provinces of Sumatera have high propensities to migrate relative to other outer islands, particularly those east of Java. This appears due to the fact that Surabaya is absorbing a large part of migrants from the eastern part of the archipelago.

89. The same paper also reports the results of a survey on migrants to Jakarta. According to the survey, 4% of migrants came due to transfer of job, 6% to study and 30% in search of jobs. Additionally 49% were dependents, and 11% of the migrants came for other and unknown reasons. It would appear that the single most important reason for migration to Jakarta was the expectation of better job opportunities.

90. Despite a large amount of migration to Jakarta in search for jobs, the unemployment rate in Jakarta is not particularly high relative to other urban areas in the country. According to the Population Census of 1971, the unemployment rate in Jakarta was 5.3% and that for all urban areas in the country was 4.8%. There were other regions which had higher urban unemployment rates: 5.3% in Sumatera and 7.5% in Sulawesi. It seems therefore that despite the large inflow of migrants to Jakarta, many of them were finding jobs.

91. The composition of migrants to Jakarta in terms of education attainment is also reported in the paper by Suharso. As shown in Table 12 the distribution of migrants to Jakarta by education attainment is close to the distribution of the entire urban population of the country. However, relative to the urban population of the country, the migrants to Jakarta contain

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1/ Suharso, "Cityward Migration and Educational Attainment in Jakarta--Indonesia", UNESCO/PEDP/7-1, September 1973.

higher proportions of senior high school and academy/university attendants. Another point which is revealed by the paper (See Appendix Table A. 27) is that more of the migrants from nearby provinces, e. g. West Java and Lampung are less educated people, whereas the migrants from distant provinces to Jakarta contain higher proportions of the more highly educated on the whole.

92. To summarize, Jakarta is absorbing a large number of migrants from all provinces of the country without alarming increases in unemployment. Migrants from nearby provinces are generally less educated, but those from distant provinces are generally better educated. This implies that distance is a significant barrier to prospective but poorly educated migrants.

Table 12: EDUCATIONAL ATTAINMENT OF URBAN AND RURAL POPULATION AND MIGRANTS TO JAKARTA

		No Schooling	Elementary School	Junior High School	Senior High School	Academy and University
Indonesia /a	Urban	22.0	56.9	14.1	5.5	1.5
	Rural	45.2	51.3	2.2	1.3	0.0
Migrants to Jakarta /b		25.0	48.0	12.5	11.1	3.5

/a Population of ten years and older, Population census of 1971.

/b Suharso, Ibid.

93. One reason why unemployment has not risen rapidly is that Jakarta has been receiving an extraordinary share of both foreign and domestic investment. For a population share of about 4%, Jakarta has been the location of more than 30% in value of intended investment projects approved under the Domestic Investment Law (see Table 13) and 20% of intended investment projects approved under the Foreign Investment Law (see Table 14).

94. The share is particularly high for manufacturing, transportation, communication and other infrastructure sectors. Two factors appear to be at work in this process: on one hand, the relatively better physical and institutional infrastructure of the Jakarta province attracts private investment in manufacturing and other urban-related activities, and on the other hand, such investment encourages migration to the area and increases demand for infrastructure investment. This is an agglomerative process without any visible end in sight (see para 342 for a review of JABOTABEK study). But, in this process a great number of highly paid jobs will be created and a further greater number of jobs will be generated for the unskilled labor

force in the trade and services sectors, producing by cumulative causation an even greater concentration of activity in Jakarta than now exists (see Table 15).

Table 13: APPROVED PROJECTS UNDER DOMESTIC INVESTMENT LAW TO BE LOCATED IN JAKARTA FROM NOVEMBER 1968 TO MAY 1972

Sector	Number of Projects		Intended Investment	
	Number	Jakarta as % of nation	Rp million	Jakarta as % of national
Agriculture	1	3	1,945	31
Estates	-	-	-	-
Forestry	-	-	-	-
Fisheries	1	11	372	14
Livestock	4	50	412	25
Mining	-	-	-	-
Manufacturing	272	41	89,661	33
Transportation	34	76	26,682	90
Public Utilities	4	80	2,909	95
Tourism	34	53	26,831	71
Infrastructure	2	29	178	8
Others	-	-	-	-
Total	352	34	148,990	32

Source: DKI Jakarta Investment Office.

Table 14: APPROVED FOREIGN INVESTMENT PROJECTS TO BE LOCATED IN JAKARTA FROM JANUARY 1967 TO JULY 1972

Sector	Number of Projects		Intended Investment	
	Number	Jakarta as % of national	US$1000	Jakarta as % of nation
Basic and Heavy Industry	33	63	43,802	58
Chemical Industry	15	79	25,697	29
Plantation and Agriculture	-	-	-	-
Fisheries	1	10	2,700	16
Forestry	-	-	-	-
Hotel	7	78	54,890	81
Infrastructure	16	100	9,841	100
Light Industry and Handicraft	86	62	101,088	68
Mining	1	6	500	0
Pharmaceutical Industry	18	53	21,522	52
Construction	25	86	52,116	48
Textile Industry	12	46	46,199	23
Trade	2	18	600	7
Transportation and Communication	11	73	9,339	58
Total	227	47	368,330	20

Source: D. K. I. Jakarta Investment Office.

Table 15: SHARE OF JAKARTA IN INDONESIAN ECONOMY

Indicator		Jakarta as Percentage of Indonesia
Population 1971		3.8
GDP, 1970	Total	8.5
originating from Manufacturing		6.5
	Construction	18.1
	Electricity, Gas and Water Supply	32.8
	Transport and Communication	23.0
	Wholesale and Retail Trade	22.7
	Banking and other Financial Intermediaries	75.8
	Ownership of dwellings	15.6
	Public Administration	13.9
	Services	3.4
National Government Tax Revenues, 1970/1971		49.8
Domestic Investment Project, (Rp) 1968 - 1971		31.7
Foreign Investment Projects, (Rp) 1967 - 1971		19.7
Savings in Tabanas (small savings) Accounts, 1972		37.5
Large Manufacturers, 1970		8.3
Government Employees, 1970		18.4
Routine Expenditures for Urban Services, 1971/1972		11.3
Development Expenditures for Urban Services, 1971/1972		38.6

Source: For GDP components, Census and Statistical Office, D. K. I. Jakarta, Regional Income of D. K. I. Jakarta, 1966-1971.
For others, Planned Community Development, Ltd. Urban Development Study Jakarta, 1973.

CHAPTER III

SPATIAL IMPLICATIONS OF SECTORAL DEVELOPMENTS

Introduction

95. As the preceding discussion of Jakarta indicates, every sectoral development has a specific location and carries with it a set of spatial implications; thus sectoral and regional developments are interdependent. To the extent that sectoral development depends on the existing distribution of natural and man-made resources, sectoral development will follow the geography which is already given to decision-makers as a precondition for development. In agriculture and the extractive industries in particular, development depends almost entirely upon the resource endowment. However, beyond this, the given spatial conditions are rarely the leading factors determining growth and development. There are, for example, groups of relatively "footloose" activities in the sense that their location depends to a lesser degree upon the spatial distribution of natural and man-made resources. Non-material oriented manufacturing activities such as textiles and the electronics industries are of this kind. For them, there is a wider scope of locational choice than there is for resource oriented activities, so that a variety of other goals can enter into the locational decision. Frequently, however, their location is conditioned by the availability of transportation and the adequacy of available infrastructure, to cite other determinants of location.

96. Sectoral developments are in turn conditioned by external as well as internal demand and technical development. Among these, external demand appears to be most significant at present for Indonesia's development. External demands encourage and help to sustain the continued growth of such sectors as petroleum, forestry, rubber and labor intensive manufacturing. Rapid rates of growth of these sectors can lead to development of those regions endowed with the relevant resources, provided that adequate backward and forward linkages can be developed. Growth of sectors both requires and induces the transfer of labor and capital within the country as well as between countries. Therefore, the speed of development depends to a degree upon the relative mobility of the factors of production. The importance of backward and forward linkages needs emphasis. Sectoral developments can proceed in enclaves in almost total isolation from the regions in which they are located. When this occurs, the benefits arising from economic growth are of little consequence for properly integrated regional development.

Table 16: AVERAGE REAL GDP GROWTH RATES OF SECTORS BY PROVINCE, 1969 - 1971

	Aceh 1/	West Sumatera	Riau	D.K.I. Jakarta	West Java	Central Java	East Java	West Nusa Tenggara	East Nusa Tenggara	West Kalimantan	South Kalimantan	North Sulawesi	Central Sulawesi	Southeast 1/ Sulawesi	Irian Jaya
1. Agriculture	11.9	7.0	4.2	21.7	25.7	5.7	13.5	7.0	1.3	14.8	36.9	18.5	9.5	8.2	3.0
a. Farm Food Crops	0.2	14.4	7.6	29.3	34.5	6.9	21.0	6.4	-7.5	4.6	28.4	23.3	13.9	-17.9	-1.4
b. Farm Non-Food Crops	27.9	-16.5	-7.6	-	-11.9	8.8	-6.9	-	33.5	-6.0	-1.6	9.5	-1.9	31.8	-29.9
c. Estate Crops	28.6	3.1	0.5	-	-1.2	6.6	-2.6	8.0	33.2	-	9.1	39.5	-1.9	-	-
d. Animal Husbandry	-70.2	32.0	-11.1	8.5	20.7	-9.2	27.8	32.1	-3.4	-22.5	58.1	37.1	15.3	107.9	26.4
e. Forestry & Hunting	426.7	113.5	101.0	-	65.4	-11.6	3.2	52.8	-41.0	263.0	972.1	260.3	61.0	135.0	-47.4
f. Fishing	17.5	-4.2	9.7	1.6	1.7	-11.9	-4.8	-3.6	134.5	31.5	31.8	17.3	1.4	283.8	20.9
2. Mining & Quarrying	-	23.2	23.7	-	43.7	79.3	25.9	-	-	-	22.7	25.1	-	209.8	-8.7
3. Manufacturing	-7.6	15.1	16.5	2.3	13.3	7.4	15.3	16.5	33.3	17.6	44.3	14.5	33.6	101.9	-8.0
a. Large & Medium Estab.			22.7	1.1	16.4	3.7	13.9	29.6	78.0	19.4	45.1	14.3	52.9	103.6	
b. Small & Household Estab.			6.2	6.4	4.3	20.0	17.6	10.3	25.8	9.3	32.9	17.8	10.9	91.0	
4. Construction	8.4	44.4	6.1	15.5	4.3	16.1	2.6	5.1	42.5	-14.1	5.0	42.0	133.4	6.1	-18.9
5. Electricity, Gas & W.S.	51.0	-0.7	25.5	12.9	3.8	8.9	23.9	20.3	16.0	22.7	27.1	25.5	7.7	603.3	31.0
6. Transportation & Communic.	7.1	55.0	14.4	11.9	15.7	11.9	5.1	29.7	23.7	7.8	19.0	55.4	33.9	113.7	35.5
a. Land Transport			6.2	4.4		9.5	49.8	42.9	26.9	26.3	6.6		38.5	576.0	39.2
b. Air Transport			97.3	93.0		301.7	57.5	-17.2	20.6)	-2.3	86.7		81.0	611.3	90.8
c. Sea & River Transport			31.4	1.2		29.9	-7.3	5.2	13.3)		16.2		68.5	-14.1	80.0
d. Communication			55.1	39.4	34.7	5.3	6.1	83.2	15.2	43.2	11.9		-1.4	6[illegible].8	-10.1
e. Others				1.4						6.3	62.8				
7. Trade	14.1	12.6	15.6	23.8	21.7	12.1	-7.7	-8.2	15.2	18.0	43.0	15.7	1.4	50.1	24.0
8. Banking & Others	30.6	14.1	8.4	1.5	42.1	63.4	96.6	189.1	-17.0	5.5	58.1	-16.2	35.2	15.8	239.0
a. Banking			7.3			61.8	110.7	184.6	-17.3	5.7	56.5		34.7	14.5	
b. Insurance			711.3			56.4	67.3	)	61.3	-11.1	71.4		356.3	-	
c. Others			-29.1			89.9	-7.3	193.1)						300.0	
9. Ownership of Dwellings	14.5	4.7	5.9	11.8	4.2	4.7	10.8	18.4	3.1	5.2	5.1	5.6	4.6	8.0	10.5
10. Public Administration	10.3	24.4	23.0	40.7	16.7	2.0	69.9	98.5	19.9	-10.2	1.5	33.5	73.5	6.9	14.6
11. Services	6.7	20.1	42.4	10.0	4.2	16.1	17.6	94.4	22.0	8.5	10.5	12.0	1.2	69.8	-15.0
12. Gross Regional Domestic Product	9.4	12.6	18.9	19.8	20.0	8.1	10.7	8.1	5.6	13.3	33.0	19.6	14.2	37.6	10.4

1/ Two year compounded growth rate based on figures for 1969 and 1970.

Source: Computed from Central Bureau of Statistics, Regional Income from 17 Provinces in Indonesia, Jakarta, 1973.

Table 17: APPROVED INVESTMENT PROJECTS BY PROVINCES

	Approved by Domestic Investment Law by April 1973		Approved by Foreign Investment Law by March 1973			
	Number of Projects	Investment Rp billion	Number of Projects	Investment equiv. Rp billion 1/	Total Investment equiv. Rp billion	Share %
D.K.I. Jakarta	449	246.5	270	205.4	451.9	25.6
West Java	240	141.3	58	90.9	232.2	13.2
Central Java	127	50.0	16	14.0	64.0	3.6
D.I. Jogjakarta	18	5.0	-	-	5.0	0.3
East Java	149	67.5	48	36.8	104.3	5.9
D.I. Aceh	15	6.5	4	3.9	10.4	0.6
North Sumatera	94	56.1	40	39.8	95.9	5.4
West Sumatera	26	12.2	3	.6	12.8	0.7
Riau	27	4.7	13	9.5	14.2	0.8
Jambi	16	2.1	3	3.3	5.4	0.3
Bengkulu	1	.2	-	-	0.2	.0
Lampung	22	7.8	3	3.7	11.5	0.7
South Sumatera	21	50.0	15	17.4	67.4	3.8
West Kalimantan	45	13.5	7	2.7	16.2	0.9
East Kalimantan	68	53.5	26	123.1	176.6	10.0
Central Kalimantan	27	19.0	6	6.8	25.8	1.5
South Kalimantan	12	2.9	8	27.2	30.1	1.7
North Sulawesi	15	28.0	3	32.2	60.2	3.4
Central Sulawesi	2	1.3	1	2.5	3.8	0.2
Southeast Sulawesi	2	11.2	-	-	11.2	0.6
South Sulawesi	13	7.5	9	41.5	49.0	2.8
Maluku	12	9.6	9	37.3	46.9	2.7
Bali	8	4.2	2	5.3	9.5	0.5
West Nusa Tenggara	2	.2)	3	1.8	2.6	0.1
East Nusa Tenggara	2	.6)				
West Irian	2	.7	9	181.2	181.9	10.3
Others			5	32.6	32.6	1.8
Total	1,415	802.1	561	961.8	1,763.9	100.0

1/ Calculated on the basis of $1=Rp415.

Source: Domestic and Foreign Investment Board

97. Table 16 shows the recent real growth rates of sectors by Provinces in Indonesia, 1/ and Table 17 the regional distribution of approved foreign and domestic investment projects. We should now examine the spatial implications of these different sectoral developments in more detail.

Minerals

98. Mineral production in Indonesia is dominated at this time by State mining enterprises as indicated by the following commodity review. Basically, however, mining activities are small scale operations which focus on panning of gold and diamonds and quarrying of ceramic clays, building materials and other industrial minerals. With the passage of Law No. 11 of 1967, the basic mining legislation now in effect, heavily capitalized foreign mining companies have invested in the country which will rapidly revamp the domestic mining operations. Since 1967, seventeen foreign companies signed "Contracts of Work" with the GOI and two companies are already in production: Freeport Indonesia (copper concentrates) and Karimun Granite. Several companies have discontinued their projects after further surveys proved unfavorable, but many others are in various stages of exploration and project planning. The vigorous exploration and development activities of foreign firms, backed by their financial and technical resources, are likely to soon surpass the production of minerals of the domestic firms. See Table 18 for recent data on minerals production.

1/ Some of the growth rates shown, particularly for some of the small subsectors, cast doubt upon the accuracy of the basic data from which the growth rates were calculated. Indeed great care must be exercised in interpreting the data. This is our illustration of the need to improve the national income accounts, which is referred to in Volume III, Chapters III and V.

Table 18: INDONESIAN MINERAL PRODUCTION
(excluding petroleum)

Mineral and Unit	1940	1966	1971	1972	1972/71
Tin-in-concentrates, MT	44,000	12,769	19,765	21,765	+10.1%
of which:					
Tin Metal, MT	nil	nil	9,217	12,009	+30.3
Bauxite, MT	274,000	701,223	1,237,610	1,275,957	+03.1
Nickel Ore, MT	55,500	117,402	900,000	935,075	+03.9
Gold, Kg	2,798	128	329	339	+03.0
Silver, Kg	46,847	6,867	8,876	8,684	-02.2
Manganese Ore, MT	11,900	900	11,958	7,538 /b	-37.0
Rock Asphalt, MT	8,000	13,905	143,303	115,000 /a	-19.8
Coal, MT	2,001,000	319,829	198,257	178,241	-10.1
Iron Sands, MT	0	0	270,900	265,915	-01.9
Diamonds, Kg	N.A.	N.A.	3,000 /a	18,000 /a	600.0
Copper concentrates, MT	nil	nil	nil	9,750	(new)

/a Estimates.

/b Preliminary.

Source: Department of Mines.

99. Since the passage of the Foreign Investment Law in 1967, 18 foreign companies have been licensed under contract-of-work arrangements to survey, explore and develop mineral resources in Indonesia. During the period 1968-72 over $300 million was spent for these purposes, including the construction of infrastructure and mining facilities. Within the next five years, further major investments with an estimated cost of about $1.3 billion are planned for this sector, mostly by foreign companies. Of the 18 companies that have obtained concessions, only one enjoys full tax holidays for three years from start of operations ("first generation contract"). The other 17 companies have signed so-called "second generation" contracts and are required to pay varying amounts of corporation taxes, royalties and rents. The "third generation" contracts under which another group of 18 applicants is being considered, require in addition to tax and other payments the full reporting to the Central Bank of all foreign exchange transactions and transfers - both in Indonesia and abroad.

100. Except for a limited quantity of coal - which is produced at a considerable loss - nearly all of Indonesia's hard mineral products are exported. Table 19 below lists the exports in the last several years. While they have been rising in absolute terms, their share in total exports has declined to 5% in 1972 and less than 3% in 1973. Tin accounts for about 80% of hard mineral exports. Under bilateral aid from several countries, the rehabilitation of run-down facilities serving these traditional mining activities is well underway and will continue until about 1978.

Table 19: EXPORT RECEIPTS FROM HARD MINERAL PRODUCTS
(in US$ million)

	1968	1969	1970	1971	1972	1973 (est.)
1. Tin	50.6	55.0	62.4	60.7	71.1	82.5
2. Bauxite	4.0	4.7	6.3	6.3	6.0	5.2
3. Nickel	2.3	2.8	7.4	11.0	11.8	10.6
4. Silver	-	-	-	0.5	0.3	0.3
5. Iron Sand	-	-	-	1.2	1.1	1.3
Total	56.9	62.5	76.1	79.7	90.3	99.9
% of total exports	6.5	6.3	6.5	6.1	5.1	2.8

101. At present only about 5 to 6% of the total area of Indonesia has been geologically mapped. In these areas only a few economically extractable deposits have been discovered. Apparently there are many deposits of industrial minerals, but these are widely scattered, generally of low grade, and often too small for immediate economic exploitation. The image of Indonesia as a potentially rich country (in terms of hard mineral resources), has yet therefore to be substantiated. Geological mapping and surveys will continue to be conducted by both the government state mining enterprises and foreign mining companies.

102. In view of the nature and limited extent of presently known mineral reserves the government is trying to find ways to process non-exportable low-grade ores. But this it cannot do without foreign participation in the form of credits and/or direct investment. Inevitably, then, the net returns of these activities to the economy will be limited in view of either debt repayment or investment income transfers. Moreover, the various tax incentives and accelerated depreciation allowances available to foreign investors under their work contracts will also reduce the net foreign exchange and tax revenues. This applies particularly to the first few years of operation, when net returns to Indonesia, in the form of royalties, will often not be higher than 10% of gross production. In the later years, when profits are being taxed, these returns may go up to 20-25% of gross production.

103. On the basis of the above data it can be concluded that, although investments in the hard mineral sector may be substantial, the returns to the Indonesia economy of projects now foreseen will remain fairly small, certainly in relation to those in the oil sector. The government should consider what means are available to increase the returns to Indonesia of existing and future mining activities.

104. In summary, over the past five years activities in the hard mineral sector concentrated on (a) efforts to restore existing productive capacity, (b) exploration and (c) exploitation of additional mineral deposits. Since these efforts require substantial amounts of financing, skills and new technology, the government has encouraged foreign participation in each of these activities through incentives provided under the 1967 Foreign Investment Law. It also has allowed the state mining companies to retain 90% of their foreign exchange earnings for investment in rehabilitation and expansion programs. Foreign project aid and technical assistance from UNDP and bilateral aid sources have also played a significant role in these efforts. It should be mentioned, however, that the mining industry is an extractive industry and important as it may be in the economic development of a country its influence in regional development is frequently considerably less. Only on some of the "Tin islands" are the effects of the mining industry readily evident in infrastructure development. To date the influence of the nickel and copper operations is still confined to restricted localities.

105. A detailed review is given in Appendix C of the main minerals other than petroleum, to which we now turn.

106. Petroleum. If the advance in the broad mineral development field has been noteworthy during the past year, the advance in the petroleum field has been spectacular. In 1972, Indonesia's crude oil production increased 21.5% over 1971 to a record 395.6 million barrels. In terms of barrels per day, production has increased from 1.08 million b/d in 1972 to 1.47 million b/d in February, 1974. Accounting for about 2% of the world crude oil production and reserves, Indonesia maintained its position as the tenth largest oil producing country in the non-communist world. Indonesia's exports of crude oil and refined products during 1972 exceeded 347 million barrels, a 26% increase in quantity over 1971. Depending upon future prices, this share of earnings is likely to become much greater. Japan continued to take about 70% of exports while about 16% went to the United States. Indonesia's imports of petroleum and petroleum products increased by 36% (12 million barrels or 3% of domestic production) due largely to an increase in demand, especially for kerosene.

107. The most striking changes during the last year were in prices paid for Indonesia oil. Since April 1, 1972, the f.o.b. export prices of Indonesia crude oil had been $2.93 per barrel (net of the value of 90 days' credit). On April 1, 1973, this net price was increased by more than 25% to $3.70. The increase reflected the devaluation of the dollar, a faster increase in world oil demand since mid-1972, and an increase in the quality premium for low-sulphur oil. The new price was, however,

effective only for a relatively short time. In early summer a contract was signed for the delivery of 30,000 barrels per day (b/d) from a new field at $5 per barrel. A general price increase to $4.75 per barrel for all other Indonesian oil came into effect October 1. Following the hostilities in the Middle East, another increase to $6 per barrel was introduced on November 1. The current price is $10.80 a barrel, which is likely to yield the GOI a revenue from petroleum taxes and royalties of well over $3 billion in 1974/75, an increase of $20 per capita. Given these steep price increases, the already strong production incentives have become even stronger. Expenditures by foreign oil contracts on exploration and production had already risen from about $40 million in 1968 to $318 million in 1972, and are expected to reach roughly $400 million in 1973.

108. Although Indonesia has been an oil producing country since 1893, it was not until 1967 when offshore exploration was permitted that intense oil exploration and production activity began. Today, over 30 companies are involved in the search for oil, the majority of them foreign owned or foreign controlled but differing from the rest of the mining industry in that they act as "service contractors" to PERTAMINA, the State enterprise responsible for the development of the country's petroleum resources. This Government-owned company is responsible for all petroleum activities including exploration, development, production, refining and domestic and international marketing. Rather than entering into "Contracts of Work" as is done in the mining industry, since 1967 the oil companies entered into "Production-Sharing Contracts", a major innovation in the contractual relationship between foreign oil companies and a State enterprise. Under this arrangement, the State enterprise and the companies share both the problems and the profits, the State enterprise having full management control for the companies' operations, and handling political and bureaucratic problems, while the foreign-owned companies concentrate on the technical aspects of exploration and production of oil and gas. Most Production-Sharing Contracts also specify that (a) all equipment brought into the country becomes the property of PERTAMINA from the date of entry into the country; (b) companies bear all exporation expenses and risks; (c) if oil or gas is produced, contractors may recover, annually, costs up to 40% of the value of production; (d) the net production split varies from 65% to 80% for PERTAMINA and 30% to 35% for the contractors; (e) there may be direct Indonesian equity participation if a company commences production; (f) companies must provide "pro-rata" crude oil for the domestic market at US$0.20 per barrel in proportion to total production and consumption; (g) companies agree to pay bonuses based on levels of production; (h) companies agree to relinquish up to half of the contract area over a specified period; and (i) if production exceeds a certain level companies must participate in some form of investment in refineries or projects related to the petroleum industry. Although appearing stringent, this type of "Production Sharing Contract" has worked well in Indonesia and is being critically reviewed for more extensive utilization by companies and governments in other countries.

109. PERTAMINA and the foreign firms working under it completed drilling about 550 wells in 1972 including 155 exploration wells. The success ratio of exploration wells, including both onshore and offshore drilling sites, has increased from 15% to 24% in the past year which is well above the worldwide industry average. Ten companies 1/ have successfully discovered new sources of low-sulphur crude oil during the last year. Of the various success stories, Petromer-Trend's Kasim and Jaya fields located onshore in the northwestern part of Irian Jaya have been most spectacular in that their reported production rate has been stabilized at 21,000 b/d 2/ but additional drilling should increase this figure to 50,000 b/d from the field within the next six months. The other new field which has come into production in 1973 is PERTAMINA's Jatibarang development in West Java expected to yield 40,000 b/d.

110. Among the production-sharing arrangements which were already in effect in 1972, important production increases have been obtained by IIAPCO and ARCO offshore the North Java coast and by Union Oil offshore East Kalimantan. Total production under these contracts, which ran at an average level of 89,000 b/d in 1972, reached 136,000 b/d in January and nearly 200,000 b/d in September 1973, with expectations of further increases. The bulk of total production, however, continues to come from Caltex's older fields in central Sumatera, which operate under so-called Contracts of Work. There, production surpassed the milestone of one million b/d for the first time in June. Since then it appears to have stabilized. Not long ago the output from this area was expected to peak in 1973, and to decline rapidly thereafter. After the recent price increases it appears likely, however, that secondary recovery techniques will be employed to a much larger extent and that the decline will come later. On the other hand, Caltex's production costs, which have been low in the past, will then tend to increase gradually.

111. In addition to various oil discoveries and confirmation wells, Mobile Indonesia operating in northern Sumatera and HUFFCO operating in eastern Kalimantan continued evaluation drilling to determine the extent of previously discovered natural gas condensate and oil reserves. The same two companies and PERTAMINA have signed agreements regarding the development of the fields and have been discussing marketing. Several other companies have indicated interest in constructing the necessary liquefaction and loading facilities as well as in purchasing the Liquified Natural Gas (LNG) and providing LNG carriers, projects that could run as high as $2 billion. Last year three new Production Sharing Contracts were signed and although millions of square kilometers have been allocated to

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1/ The companies include CALTEX, PERTAMINA, STANVAC, ASAMERA, ARLO, IIAPCO, Union, Cities Services, CONOCO and Petromer-Trend.

2/ Some reports present figures of 32,000 b/d for these wells in these fields.

various companies, many millions more have not yet been contracted. Of Indonesia's estimated 1.7 million km^2 of land area and 3.4 million of water area, only 172,000 km^2 of land area and 1.9 million km^2 of water area have been extensively explored. Much still awaits the application of modern exploration techniques.

112. Mining Policy. The Indonesian policy in the mining sector is based on the principle that the mineral wealth of the country is the inalienable property of the Indonesian people. However, it is recognized that the mineral potential cannot be realized without a substantial investment by foreign capital and technical expertise, that investment in the mining sector is of a high risk type, and also that such capital-intensive investments do not necessarily lead to high returns to the economy. Thus, the government has sought various ways to increase Indonesian participation in the industry. Foreign mining companies today are obligated to offer a minimum of 20% of their shares for sale to Indonesians within five years of reaching a production stage. They are required to hire a maximum of Indonesia citizens for their operations, must strive to obtain their supplies from domestic sources and must provide amenities for the communities in which they operate.

113. At present the Government is engaged in reviewing the mining "Contract of Work" which presents the terms under which foreign companies may operate in the country. The draft of a "Third-generation Contract" contains an entirely new investment allowance provision that permits mining companies to deduct 20% of their investments from earnings at a rate of 5% per year for four years. The duty free import period has been reduced from thirty years to five. One proposal which may be objectionable to the mining companies is the condition that would require them to deposit their receipts from export sales in Indonesia rupiah accounts from which amounts required for foreign payments would be drawn. It is based on Government Regulation No. 16 of 1970 which made the surrender of foreign exchange earnings the rule for all exports. The Indonesian position is that the established free-exchange policy of the government should provide adequate assurance against the imposition of multiple exchange rates or other restrictions on foreign remittances. The mining companies, many of them foreign owned or foreign controlled, remain apprehensive about this condition if it is enforced.

114. Consistent with the basic principle of maximizing domestic value added, strong encouragement is being given to the processing of mineral exports within Indonesia. Thus, mining proposals which involve any integrated operation through the metal stage are normally reviewed more favorably than those which export ore directly.

Agriculture, Forestry and Fishing

Agriculture

115. It is usual to characterize Indonesian agriculture by dividing it into two broad types: the "Central Core" of Indonesia, consisting of the Islands of Java, Madura, Bali and Lombok, and the Outer Islands which includes all the rest of Indonesia. In one sense this is an important and interesting division because it highlights the fact that 67% of the population is concentrated in the Central Core of Indonesia, producing by and large food crops and very little by way of exports; while the bulk of Indonesia's agricultural exports come from the Outer Islands. The differences between the Central Core and the Outer Islands of Indonesia are in a large measure due to differences in soils and climate. Thus, in general, the soils of Java, Madura, Bali and Lombok which have developed from basic volcanic rocks are on the whole more fertile and less acidic than soils elsewhere in Indonesia. There are variations in fertility within the Central Core Islands. For example, because of rainfall differences, the soils of West Java are more leached than those of Central and East Java. But the combination of fertile soils and a favorable rainfall distribution, coupled with natural irrigation facilities in Java and the other Central Core islands, has resulted in a very intensive system of agriculture. The average size of holdings in most parts of the Central Core Islands is less than half a hectare and the average size is likely to fall due to the inheritance laws. In Lombok, for example, property has to be divided in the ratio of 2:1 sons to daughters, and after this division, the land allocated to the sons is divided equally between them and similarly for the daughters. With an average completed family size of about four to five it can be seen that this is going to cause serious problems in the not too distant future.

116. The differentiation of Indonesian agriculture given above hides the fact that there are important differences within the Outer Islands. Thus, because of differences in both soils and climate, the agricultural systems prevailing in Sumatera are as different from those prevailing in, say, the Eastern Nusa Tenggara islands as between Java and Sumatera. Although the soils of many of the Outer Islands are indeed poor relative to the volcanic soils of the Central Core Islands and are not in general suitable for growing wet paddy, they are adequate for growing a large variety of tree crops, such as rubber, oil palm, cocoa, coffee and tea, spices, coconuts and some food crops on a selected basis. It is in these islands also that the bulk of Indonesia's forest reserves are situated (see next section).

117. Although agriculture plays an important part in the lives of the people of Indonesia -- it constitutes 41% of the total GDP, and 63% of the population of Indonesia make their living in the agricultural sector -- there is no breakdown of the agricultural GDP to the provincial level. Indeed, there is no provincial breakdown of the area planted and of the production of all the main crops growing in Indonesia. Thus Appendix Table A.35, which is taken from the Volume I of the Bank's Agriculture Sector

Survey of Indonesia, gives the overall figures with respect to crops for Indonesia as a whole, including the projections made by the Agricultural Sector Mission for the years 1975 and 1980, but no regional breakdown of these figures is available. Text Table 20, however, gives an island breakdown of the harvested area and of the production of the principal food crops in Java and the Outer Islands for 1971. It is interesting to note that Table 20 illustrates just how heavily concentrated food production is in Java. For example, just over 50% of the total area devoted to paddy is in Java; the percentage is even higher for maize (70%), cassava (76%) and even higher still in such things as peanuts and soybeans, and almost all sugar is grown in Java. If a similar table were available for the non-food crops it would show an equally heavy emphasis of production in the Outer Islands. Thus all the rubber is grown in Sumatera and in Kalimantan; virtually all of the palm oil is grown in Sumatera and most of the coconuts are grown in the other Outer Islands of Indonesia.

Table 20: HARVESTED AREA AND PRODUCTION OF PRINCIPAL FARM FOOD CROPS IN JAVA AND OUTER ISLANDS, 1971

	Irrigated Paddy		Non-irrigated Paddy		Total Paddy		Maize		Cassava		Sweet Potatoes		Peanuts		Soy Beans	
	Area (1000HA)	Production (1000 MT)	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.
Jakarta	12	24.9	1	1.3	13	26.2	1	.8	3	28.0	-	2.3	1	.3	-	-
West Java	1539	4938.9	194	275.7	1733	5214.6	107	99.2	218	1816.0	60	341.4	59	45.6	27	19.8
Central Java	1201	4188.0	55	89.2	1256	4277.2	523	632.0	322	2253.4	45	259.4	75	59.1	127	83.9
Jogjakarta	88	308.0	41	59.0	129	367.3	38	41.9	60	386.6	2	10.4	21	12.5	25	12.2
East Java (including Madura)	1107	3931.2	68	128.0	1175	4059.2	1161	1122.6	454	2846.5	64	332.4	137	99.7	388	288.2
Total Java	3947	13391.0	359	553.5	4306	13944.5	1823	1896.6	1057	7330.5	171	945.8	292	217.2	567	404.2
Sumatera	1396	4931.7	587	936.9	1983	5868.5	127	179.5	95	926.3	50	321.3	18	18.6	26	18.9
Kalimantan	470	926.0	234	297.1	704	1223.1	15	11.1	33	288.5	4	24.8	2	1.6	2	1.1
Sulawesi	598	1950.5	118	179.5	716	2130.0	351	284.9	79	626.6	28	156.0	33	23.6	5	3.7
Maluku and Irian Jaya	1	3.0	14	21.2	15	24.3	27	21.1	22	213.0	35	290.4	6	3.5	3	1.9
Nusa Tenggara	371	1233.4	122	133.1	493	1366.5	272	238.3	95	656.9	59	415.5	23	15.7	63	45.4
Indonesia	6783	22435.6	1439	2121.3	8222	24556.8	2616	2631.5	1382	10041.7	347	2153.7	375	280.1	666	475.3

Source: Statistical Pocketbook of Indonesia, 1970-71, pgs. 110-113.

118. What are the prospects for agricultural development in the various parts of Indonesia taking into account the differences in soils, in climate, and in stages of economic growth and development? This question can best be answered within the context of two important related issues. The first issue is whether, given the high population density, overcrowding and lack of land in the Central Core Islands, scarce resources should be devoted to trying to increase output and productivity in these islands, or whether the resources should not rather be devoted to developing the Outer Islands where there is plenty of space and scope for general agricultural development. This immediately raises the second important issue which is whether transmigration schemes can solve the overcrowding in the Central Core Islands and be used to populate and develop the Outer Islands. The past attempts at transmigration have hardly been a conspicuous success, but it does not follow from this that properly devised and implemented transmigration schemes cannot help to alleviate the overcrowding of the Central Core Islands. On the other hand, the juxtaposition of the fact that the Javanese population alone is increasing at the rate of just over one and a half million people a year with the known administrative and absorptive capacity constraints which are so evident in Indonesia, make it quite obvious that transmigration cannot solve the problem of overcrowding in the Central Core Islands. In the longer run, unless the rate of growth of population can be reduced significantly, either through natural means or with the assistance of family planning programs, it is fairly evident that with the existing state of knowledge, agricultural productivity could not be increased sufficiently to cater for the growing needs for food of the people of the Central Core Islands. In the short and medium term, however, it should be possible to increase productivity and output significantly through greater intensification of paddy and other food crops. The World Bank has financed four irrigation rehabilitation programs in Java and the effect of this investment has yet to have its full effect on output. It is important to continue monitoring the results that have been achieved in these rehabilitation programs and to apply the lessons learned to other irrigation areas in Java, Bali and Lombok. More and better on-farm irrigation development together with improved seeds and the application of fertilizers through credit should do much to increase the productivity and output needed over the next few years. The BIMAS program for rice provides credit for greater intensification in the Central Core islands, but it needs to be administered more efficiently, and it is important that the Central Research Institute for Agriculture should provide improved seed for other food crops as well as rice. In addition, in some parts of the highlands of Java overfelling of timber has resulted in serious soil erosion and there is a need over the next few years to improve soil conservation practices and to carry out some reforestation, perhaps in conjunction with pulp and paper production.

119. Rather than viewing transmigration as a means of solving the overcrowding in the Central Core Islands it should be treated in its own right as a means of developing the Outer Islands. There have been four basic problems with the past and existing transmigration projects. These

are, first, that the land has been allocated on ad hoc basis, with a quite arbitrary figure of 2 hectares allocated to each family; second, the resettlement areas have tended to be too small and scattered and this has resulted in diseconomies of management and marketing, etc.; third, there has been insufficient cooperation between the various government departments to provide a basic infrastructure and social services; and fourth, the Department of Transmigration is weak and has not been operationally orientated.

120. In planning future settlement schemes, it is suggested that two closely monitored types of settlement schemes be tried: (a) some midi, fairly intensive settlement projects, which are relatively expensive in terms of investment per settled family, but not so intensive or expensive as, for example, the FELDA settlement projects in Malaysia; and (b) mini-settlement projects which, coupled with improved inter-island transportation, seek to channel and guide spontaneous resettlement.

121. Type A - Midi-Settlement Schemes

(a) the early setting aside of land for settlement in large enough blocks, preferably not less than 40,000 hectares, to help keep down administrative costs.

(b) The importance of aerial survey and land use planning in preparing settlement schemes.

(c) The use of a target income rather than a fixed hectarage as a basis for each farming unit. The present thinking is that the area allocated to each farmer should be sufficient to provide subsistence food plus a cash income of about US$500 a year.

(d) The necessity of providing support services such as roads, schools, health centers, planting material, markets, etc.

(e) Priority should be given to spontaneous settlers as they are likely to make the best ones.

(f) Emphasis should be put on juxtaposing the new settlement schemes alongside the existing ones in order to improve the existing ones and provide them with better infrastructure and social services.

122. Care should be exercised to ensure that in those areas not suitable for irrigated or wet paddy that the Javanese system of agriculture is not perpetuated in areas in which it is not well suited. For example, in Lampung Province in Sumatera, emphasis should be on growing cassava or other food crops, and on legumes or other grasses to clean the land from Alang alang grass (Imperata cylindrica (L)-beauv);

and then to plant with a cash crop such as rubber or oil palm. A major reason for the failure of past settlement schemes has been the absence of infrastructure and social services. Hence, it is important to provide such services in any future resettlement schemes. This may perhaps best be done through the provision of a number of Service Centers which would eventually develop into self-governing villages. Such Centers would provide some of the following services for about 2,000 families: (a) facilities for the extension and credit staff, (b) education and medical services, (c) shops, (d) a cooperative center, (e) provide improved planting material, (f) hold cattle for sale to farmers, (g) demonstrate the planting and tending of crops and livestock, and (h) provide a limited tractor hire service for the first few years of the resettlement scheme. The World Bank's Resident Mission in Jakarta is in fact preparing a settlement project along the lines given above.

123. Type B - Mini-Settlement Schemes

(a) Selection of fairly large blocks of land to minimize administrative costs - preferably not less than about 40,000 hectares.

(b) Application of land use planning through aerial surveys to provide demarcated settlement plots large enough for both subsistence crops and some cash crops.

(c) Provision of simple extension advice.

(d) Provision of low cost farm-to-market roads, using labor-intensive methods and food aid.

(e) Reservation of sufficient land for marketing/village centers and other economic and social infrastructure facilities in the future.

(f) Provision of some elementary schooling and rural clinics staffed by paramedical personnel.

124. We envisage that mini-type settlement schemes will over time be progressivley upgraded to midi-type schemes. It is important for the success of mini-type schemes that transport services between the emigration and immigration area be improved and maintained.

125. Turning now to the development prospects of the Outer Islands, the lack of extensive soil surveys below the exploratory level, particularly in Sumatera and Kalimantan, makes planning extremely difficult. The soils of particular interest are those grouped as red-yellow podzolic soils and organic soils (including the acid-sulphate soils) in the swampy areas of both of these islands. The red-yellow podzolic soils cover an area 51 million hectares of which 48.3 million are outside Java. These soils have a good potential for a wide variety of crops such as maize, cassava

and pasture, etc. Much of this area at present is covered with forest (18 million hectares) and Alang alang (12 million hectares). The soils of the tidal swamps and marshland consist predominantly of acid-sulphate soils which need intensive investigation before extension of cultivation of these areas should be considered. Parts of the tidal swamps have been developed through the traditional Pasang-Surut irrigation-cum-drainage systems, and it has been proposed to develop an additional 150 thousand hectares with a modification of this system. Under this system, during high tides fresh water from the rivers is let into the fields by means of canals connected to the river bank. At low tide the discharging water is supposedly removing the acidity from the soil. However, it is probable that this so-called "washing" function of the water is also removing essential nutrients from the soil. 1/ Not all of the swamps and marshland consist of the acid-sulphate soils: about 17 million hectares or 8% of the total Indonesia land under cultivation is covered with organic soils and these soils have a fairly good potential for the cultivation of rice and dry crops like cassava, coconut, pineapple and citrus, etc. These organic soils can be made highly productive under appropriate management systems. In April 1974, with assistance from the Netherlands Government, the UNDP/FAO Land Appraisal Project working at the Soils Research Institute embarked upon a three year program to investigate the problems of management of these organic soils.

126. References have been made to the problem of Alang alang grass. There are large areas of Indonesia under Alang alang grass. The grazing value of this grass is low when it is young and it rapidly becomes indigestible for cattle. Alang alang grass has spread as a result of forest and bush clearance and the system of shifting of cultivation in the islands of Sumatera, Kalimantan and Sulawesi. Although Alang alang is a serious problem, preliminary investigations indicate that good results can be obtained from plowing and then by sowing with different leguminous and grass species. Leguminous plants like Stylosanthes guyanensis, Centrosema pubescens, and Pueraria phaseoloides and grasses like Paspalum notatum and other paspalum species show great promise.

127. At this point it is appropriate to look at the livestock industry. Except in Nusa Tenggara and Sulawesi provinces, where cattle are kept to produce beef from natural grassland, cattle and buffalos are generally kept as draft animals for crop cultivation and transport, with meat and hides as by-products. In the World Bank's Agricultural Sector Mission Report, it is suggested that livestock development be looked at primarily as a tool for raising the aggregate income of existing small holder communities. We would support this but would not rule out projects which would increase the output of beef from ranching. One such project is that proposed in a report by a New Zealand consultant which looked into the development of beef cattle industry in Sumatera and Kalimantan.

1/ Schophuys, H.J., 1970. Perspectives of Lifting Water for Irrigation and Drainage in Indonesia in general and in Sumatera and Kalimantan in particular.

It proposed that during the first ten years cattle ranches would be developed for Bandera (9,000 hectares) and Sebuhur (8,600 hectares), both of which are in Kalimantan-Selatan; and for Balang Bitang (9,400 hectares) and Padang Lawas (16,000 hectares) in Sumatera. At full production the ranches are estimated to carry the following number of cattle: Bandera (7,588), Sebuhur (13,384), Balang Bitang (7,305) and Padang Lawas (12,432). These operations would be in addition to the existing operations in South Sulawesi (11,000 hectares) and in Timor (40,000 hectares).

128. The Agricultural Sector Survey Mission further proposed that for ecological and economic reasons livestock development should be grouped under two long-term land use patterns: (a) the introduction of mixed farming with a grass/legume phase for cattle production, in rotation with dry land cash crops (rain-fed rice, soyabeans, maize, ground nuts and cassava); and (b) the establishment of mono-culture pasture farming for ranching -- in many cases, as a first phase of development proceeding to the establishment of mixed farming. The ley farming system proposed would be completely new to Indonesia and further investigation is needed before it can be practiced at all widely. On the other hand, some aspects of this system may find support from such projects as the Mitsugoro farm where it has been demonstrated that, for example, maize can be grown with success on former Alang alang infested land.

129. In summary, the development of Java should take the form of further intensification of crops, particularly irrigated paddy by the further rehabilitation of existing infrastructure and the provision of new infrastructure by increasing the amount of on-farm irrigation development (additional tertiary canals and drains, land consolidation and leveling) and additional extension services. The Central Research Institute for Agriculture in Bogor and the regional research stations should step up their work to provide improved seeds particularly rice and the other food crops. At the same time, in the highlands of Java soil conservation and reforestation programs are badly needed to prevent further soil erosion and to protect the watersheds of the rivers. The agricultural prospects for Sumatera are very bright. There are good possibilities for further developing rubber, oil palm, cocoa, coconuts, etc., on an estate basis, and also increasing the number of smallholders, particularly in connection with nucleus estates which would provide services (including processing facilities) which would otherwise be provided by an agricultural extension service. Possibilities are also good for other crops in Sumatera and the vegetable exporting industry to Singapore and Malaysia can be developed further. As the next section points out, the main potential for development in Kalimantan lies with forestry, but if the rivers of Kalimantan can be opened up, then large areas can be made available for development of rice and other food crops and for the further development of rubber and other tree crops. The mountains of Sulawesi limit the possibilities for agricultural development of rice and other food crops. Too little is known about the agricultural potential of East and West Nusa Tenggara, the Maluku Islands and Irian Jaya, although it is believed that the potential for agricultural development in Irian Jaya is good. There is a need to mount

a cross-sectoral study of the rehabilitation of agriculture, particularly the growing of coconuts and spices, in the smaller Outer Islands together with improvement in the sea and air transport services to these Islands. The vicious circle of deteriorating transport services leading to a fall-off in the management of coconuts and other crops, which in turn leads to further deterioration in transport services, and so on, must be broken and this can only be done by a project which will integrate in carefully phased steps the rehabilitation of both agriculture and transport.

Forestry

130. The forestry sector has witnessed an expansion in recent years in production, export volume and export values exceeded only by the petroleum sector. Exports of lumber totalled about US$170 million in 1971, climbed to US$230 million in 1972, and had already passed US$386 million by the end of the third quarter of 1973. The greatest expansion in logging operations has taken place in Kalimantan, with substantial development also taking place in eastern Sumatera, Maluku and Sulawesi. Unfortunately, most of the lumber exported to date has been in log form, with concentration of saw-milling operations chiefly around Banjarmasin in South Kalimantan and Pontianak in West Kalimantan. The well-established milling industry of South Kalimantan is reported to be operating well below capacity, due to the comparative depletion of that small province's forest resources and the tendency of Central Kalimantan to promote direct export of logs over shipment to Banjarmasin for processing, in order to receive the substantial export tax and royalty revenues. The expansion of milling operations (and the installation of a large plywood factory) is still proceeding at a rapid rate in West Kalimantan, 1/ where logging has yet to make serious inroads on the forest resource. East Kalimantan, which may possess the most valuable tropical hardwood reserves in Indonesia, still exports logs almost exclusively.

131. The 1971 Industrial Establishment Registration reports about 18,000 persons employed in large and medium-sized sawmills, 2/ of whom about 7,000 worked in the teak mills on Java. This number has increased substantially since then, with the rapid increase in milling operations and exports in the Outer Islands. 3/ Despite the great scope for increases in employment in processing, much more employment is generated by logging

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1/ 35% of West Kalimantan's timber export is sawnwood processed by 36 exporting mills, according to the Governor of the province.

2/ Statistical Pocketbook of Indonesia, 1970-71, pp. 157, 179.

3/ The Capital Investment Coordinating Board estimates that over 5,000 new jobs in wood manufacturing will result from investments approved in 1971 and 1972 alone.

operations, which in Indonesia are quite labor-intensive. The labor demand of these operations has helped raise the average daily wages of unskilled labor in provinces in Kalimantan and eastern Sumatera to up to five times the levels in Java. In one sense this is a constraint on development of lumber extraction, but in another it is a signal that a new kind of opportunity for transmigration - albeit on a small scale compared to Java's population problem - is opening up in the Outer Islands.

132. The strategy for the future development of forest industries outlined in the Agriculture Sector Review Report is in keeping with the requirements of balanced regional development. This strategy puts first priority on major investments in processing - i.e., a pulp and paper mill - at Cilacap, in Central Java, where labor is abundant, demand for paper goods is many times the level of local production, and existing coniferous plantations and empty land at suitable elevations are available for supply. 1/

133. The most immediate need for Government action in the forestry sector, however, is not in the field of production but in the area of forest inventory and conservation, particularly in Kalimantan. At present, almost all of the most valuable forest areas of Kalimantan have been covered by concession contracts with private firms, with little knowledge on the Government's side as to the extent and value of the resources, the impact that logging operations will have on the forest resources, or any effective supervision and control of logging operations. There are two basic requirements. First, the proposed National Resource Survey and Mapping Program would aid immeasurably in the effort to prevent destruction of this vital resource, both through its aerial photography and mapping components and through its provisions for resource inventory and evaluation work, and for the establishment of an up-to-date resource data bank. Until an integrated effort on this scale is implemented, knowledge of the forestry resource, continually menaced by slash-and-burn agriculture and the uncontrolled operations of logging entrepreneurs in the Outer Islands and by the high demand for fuelwood and construction material on overcrowded Java, will remain in the "guesstimate" stage portrayed by Appendix Table A.36. Second, all existing forestry concessions are in need of review and revision to the extent considered essential and feasible legally. Additionally, it would be desirable to devise -- with the help of technical assistance -- a standard form of concession contract which would ensure sound forestry and conservation practices.

1/ An additional pulp and paper complex in Aceh or North Sumatera may be profitable in the future, based on exploitation of nearly 150,000 ha of natural pine forest in Aceh.

Fisheries

134. The fishing industry derives its importance from the fact that it provides the largest single source of protein in the Indonesian diet (particularly in the Outer Islands), and that it provides employment to over two million people. Government statistics show a total of nearly 900,000 men engaged in marine fisheries, of whom nearly 600,000 are classified as full-time fishermen, while over 1,200,000 people are engaged in inland fisheries (including fish culture), about 400,000 on a full-time basis. The known fishing grounds are shown in Cartographic Appendix, Map 6, and conform to technical studies of food productivity of the waters surrounding Indonesia. 1/ At present, the most economically productive grounds are in the Straits of Malacca and around the coast of Kalimantan, including the Makassar Straits between Kalimantan and Sulawesi.

135. The level of development of the fishing industry is uneven throughout the country, with the most capital-intensive methods being used in Sumatera and Kalimantan; over 80% of all the motorized fishing boats are registered in those two islands, and 34% of all motorized craft are found in the province of Riau alone. On the other hand, East Java had only 13 registered motorized craft as late as 1971, Central Sulawesi had 4, and none at all were registered in Southeast Sulawesi or Nusa Tenggara Timor. 2/ This situation is reflected in the much higher productivity of boats and men in Eastern Sumatera and Kalimantan (see Appendix Table A.37) and is typical of the higher capital-intensity and labor-productivity of most industries in those regions. Appendix Table A.38 shows the total fish production (inland and sea) by region and production per head of population. While the differences in the latter are evened out to some extent by trade, the fact remains that the people of Java, Bali and Nusa Tenggara generally must eat fish more as a delicacy rather than as a staple element in their diet. In this regard, the strategy for fisheries development outlined in the recent Agriculture Sector Survey Report, which stresses small trawlers for Java (to provide shrimp for export and numerous varieties of seafood as well as shrimp for domestic consumption) and tuna fishing (mainly for export) in the eastern islands, is quite appropriate. There is also scope for the further development of the brackish water fishing areas.

1/ See Doty, Maxwell, and Soegiarto, Aprilany, "The Development of Marine Resources in Indonesia", in Indonesia, Resources and Their Technological Development, Harold W. Beers, ed.

2/ Based on DG Fisheries data in the Statistical Pocketbook of Indonesia, 1970-71, pp. 140-145.

Industry

136. Manufacturing is still a relatively small sector of the Indonesian economy, accounting for less than 10% of the GDP and 7.5% of employment, and has grown only moderately faster than the rest of the economy in recent years. As noted earlier, urban manufacturing actually declined in the 1961-71 decade, and the greatest growth was in rural manufacturing on Java. This was of two kinds: (a) encircling Jakarta; and (b) small scale production in East and Central Java. In the coming years, industry should grow rapidly not only because this sector normally plays a leading role as economic development proceeds, but also from the viewpoint of regional development, because the GOI is promoting it in the growth centers of Surabaya, Medan and Ujung Pradang.

137. One of the most commonly expressed concerns of the people in the Outer Islands is that industry is heavily concentrated in Java, particularly in the Jakarta area. This is certainly the case when the value-added of manufacturing is compared in aggregate terms, but the available gross regional product data (Appendix Table A.18) also indicate that during 1969-71 the provinces of Java accounted for 60% of the national value-added from the manufacturing sector, or a little less than the proportion of population living there. However, due to their urban character, Jogjakarta and Jakarta have the highest per capita value-added in manufacturing -- Rp 4,400 and Rp 4,200 respectively, compared to the national average of Rp 2,300.

138. The data on manufacturing activity in Indonesia are scarce and the regional information is even scarcer. The Central Bureau of Statistics conducts annually a sample survey of medium and large scale industry, but, as of now, 1970 is the latest year for which the raw data have been processed. These data indicate that, out of the country's total installed capacity of 1.4 million horsepower (which is a good indicator of the modern sector), the provinces of Java accounted for some 82% (Jakarta and East Java alone accounting for 31% and 27%). Similarly, of the total labor force of 848,000 employed in these enterprises, Java accounted for 86% of the total, with West, Central and East Java each accounting for 20-30%. The data do indicate that industry outside Java is strongly raw material oriented. (See Appendix Table A.15.)

139. The GOI's policies on industrialization to date have not displayed any strong regional orientation, even though 33% of the recent domestic and 50% of the foreign investment in manufacturing has been largely located in the vicinity of Jakarta. With only limited opportunities for expanding employment in the agricultural sector in Java, growth of industry for that region does provide a feasible and attractive alternative. Since most of the consumer demand also originates here, light consumer goods industry may make good economic sense. However, at present the Indonesian exports consist mostly of raw materials, which originate primarily in the Outer Islands. It would seem desirable to orientate industrialization in these islands towards the processing of the local raw materials. In the case of timber and rubber -- the two leading non-

oil exports -- a stage has been reached to expand the processing facilities and export these products in processed form (e.g., crumb rubber and plywood). Other possibilities for industrialization of the Outer Islands are in the field of rubber manufactures, paper, petro-chemicals, and aluminum goods.

Transport, Communications and Trade

140. The outstanding fact about the Indonesian transport system is the extent to which the physical geography of the country has dictated the predominance of different modes in different regions, partly directly, because of the great areas of dense forests, swamps and rugged mountains and the great distances between the islands, and partly indirectly, through the geographical influences on patterns of economic activity. The major geographical influence is, of course, the archipelago nature of the country, which means that the most important integrative transport mode for the country as a whole is shipping. The importance of shipping in the country's transport system is further compounded by the difficult terrain and consequent difficulties in land transport in the larger Outer Islands (thus enlarging the role of coastal shipping) and by the associated importance of river transport as a means of access to the interior of Kalimantan and Sumatera. The large rivers of those islands have discouraged the building of roads parallel to the coastline and the absence of roads has inhibited internal trade. Production for export, particularly of rubber, timber and forest products is moved cheaply downriver, assembled and processed at river ports like Palembang, Pontianak, Banjarmasin, Jambi, Balikpapan and others.

141. The potential integrative role that shipping could play in Indonesia's regional development has been limited by the slow growth of manufacturing in Jakarta and its environs. Colonial policy encouraged export directly from the export-producing regions with little emphasis on manufacturing of consumer goods for internal trade, at least until the collapse of export markets during the great depression.

142. There is still little complementary regional specialization in manufacturing, and most inter-island trade is in agricultural consumer goods (e.g., rice and sugar from Java to other islands, copra and fish to Java); basic natural resources and derivatives like petroleum products, asphalt and timber (from the Outer Islands to Java); and reexports from Jakarta and Surabaya to the nearby provinces. The slow pace of development of import-substitution on Java, together with the increase in economic activity in Java, help explain the ever-worsening trade balance of Java 1/ (see Table 21), an imbalance which is not compensated for by the small

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1/ 90% of Java's deficit is accounted for by the imports into and exports from Tanjung Priok, Jakarta's port.

surplus 1/ Java may enjoy on interisland trade. Meanwhile, over 73% of all recorded outgoing sea freight heads directly overseas (93% for the four Kalimantan provinces). This form of development is partly due to the dearth of industries using native raw materials, 2/ partly due to the inefficiency and corruption which plague shipping and port operation, and partly due to the geography of the country which injects a foreign port, Singapore, into the middle of Indonesia's inter-island and international trade.

1/ TCAS estimated a surplus of about US$30 million for Java's inter-island trade in 1969, but since then shipments of petroleum products from Sumatera have probably increased substantially. In 1959, Java's surplus on interisland trade was about US$214 million, while in 1960 it was over US$300 million, more than enough to balance its foreign trade deficit. See Statistical Pocketbook of Indonesia, 1961, pp. 147, 148.

2/ Two of the major domestic manufacturing industries, cigarettes and textiles, are located in the predominantly agricultural regions of Central and East Java and use a high proportion of imported raw materials.

Table 21: IMPORTS AND EXPORTS INTO DIFFERENT ISLANDS 1967-71
(000 $ U.S.)

		1967	1968	1969	1970	1971
Java - Madura	Exports f.o.b.	87,756	85,173	72,640	115,284	153,224
	Imports c.i.f.	511,245	536,935	578,660	754,010	796,686
	Trade balance	-423,489	-451,762	-506,020	-638,726	-643,462
Sumatera	Exports	501,682	542,872	666,972	862,672	843,484
	Imports c.i.f.	113,678	155,319	167,703	193,059	217,444
	Trade balance	388,004	387,553	499,269	669,613	626,040
Kalimantan	Exports f.o.b.	53,900	61,136	84,176	123,346	160,128
	Imports c.i.f.	9,433	16,925	16,904	24,399	48,329
	Trade balance	44,467	44,211	67,272	98,947	111,799
Sulawesi	Exports f.o.b.	15,450	32,484	22,751	34,533	35,105
	Imports c.i.f.	14,368	6,285	17,137	27,352	30,582
	Trade balance	1,082	26,199	5,614	7,181	4,523
Nusa Tenggara	Exports f.o.b.	3,550	4,461	3,638	7,670	6,476
	Imports c.i.f.	359	346	163	1,703	1,601
	Trade balance	3,191	4,115	3,475	5,967	4,875
Maluku	Exports f.o.b.	3,097	4,543	3,476	16,092	23,458
	Imports c.i.f.	172	37	72	1,022	5,683
	Trade balance	2,925	4,506	3,404	15,070	17,775
West Irian	Exports f.o.b.	-	-	-	977	1,716
	Imports c.i.f.	-	-	-	-	2,501
	Trade balance	-	-	-	977	-785
Total above	Exports f.o.b.	665,435	730,669	853,651	1,160,574	1,223,591
	Imports c.i.f.	649,255	715,847	780,639	1,001,545	1,102,826
	Trade balance	16,180	14,822	73,012	159,029	120,765

Source: Biro Pusat Statistik

143. The second factor has become more important since Independence. The State-owned shipping line of the Netherlands East Indies was obliged, from 1931 onwards, to call directly at 280 ports with a minimum frequency of four weeks, while another 202 ports were served optionally. While this system would be too dense for modern shipping and port technologies and for a system with an improving road network and increasing numbers of motor vehicles, the present situation is one where the eastern islands of Indonesia have no reliable shipping service at all. A vicious circle has set in of deteriorating shipping service producing neglect of export production and reversion to subsistence farming, resulting in reduced demand for shipping and further deteriorated service. 1/ This situation is aggravated by inefficiencies in cargo handling and storage and by "invisible payments" often amounting to over 100% of the published freight rate in the major Indonesian ports, particularly Tanjung Priok, 2/ so that shippers in the eastern islands are encouraged to attempt to export directly to foreign countries.

144. The same port and shipping problems may work to distort modal choice towards sailing ships 3/ which do not require modern port facilities, and to road and rail transport on the Java-South Sumatera corridor. Available statistics 4/ show almost no shipping along the north coast of Java, while bulk items like rice, cement, sugar and soybeans are shipped over 700 kilometers by rail from Surabaya to Jakarta. The published coastal freight rates, given in Appendix Table A.28, indicate extremely low rates for these commodities (0.6 cents per ton-kilometer for rice, sugar and cement), while statistics for Japan show that 60% of the freight traffic moving more than 600 kilometers went by coastal shipping, with substantial

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1/ An additional cause may have been lower copra prices at critical earlier points in time.

2/ The Nedeco Ports and Dredging Team (TSKT) estimate that 33% of the total throughput costs at Tanjung Priok port (Jakarta) can be allocated to "invisible costs for unnecessary activities".

3/ The Transport Coordination Advisory Service (TCAS) team estimate that 130,000 tons of timber were shipped from South Sumatera by sailing ship in 1970 (up from 100,000 tons in 1969), compared to the 35,000 tons recorded for freighters (up from 24,000 tons). Of course, sailing vessels may have other, purely economic advantages also.

4/ From Interisland Sea Transport (Dry Cargo) Republic of Indonesia, 1971, compiled by the TSKT team. In 1959, 25,000 metric tons of sugar were sent from East and Central Java to West Java by sea, while in 1971 no sugar was sent by sea. Also, in 1959, over 37,000 tons of cement were shipped by sea from East to West Java, while only 100 tons were shipped by sea in 1971. See Statistical Pocketbook of Indonesia, 1961, pages 156, 164.

Table 22: NUMBER OF CARS, BUSES AND MOTORCYCLES BY PROVINCE AND ITS AVERAGE PER 10,000 POPULATION, 1971

No.	Province	NUMBER			AVERAGE PER 10,000 POPULATION		
		Cars	Buses	Motorcycles	Cars	Buses	Motorcycles
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	D.I. Aceh	1,823	579	7,835	9.0	2.9	38.6
2.	North Sumatera	21,903	2,976	52,138	32.6	4.4	77.9
3.	West Sumatera	3,120	1,196	6,658	11.0	4.2	23.6
4.	Riau	3,333	242	11,289	20.1	1.5	68.1
5.	Jambi	1,147	323	2,529	11.3	3.2	24.9
6.	South Sumatera)	12,168	3,090	16,153	17.9	4.5	23.7
7.	Bengkulu)						
8.	Lampung)						
9.	D.K.I. Jakarta	95,077	5,834	129,528	205.4	12.6	279.8
10.	West Java	36,698	2,162	60,683	16.9	1.0	27.9
11.	Central Java)	23,068	1,755	80,338	9.5	0.7	32.9
12.	D.I. Jogjakarta)						
13.	East Java	42,876	2,147	104,951	16.7	0.8	40.9
14.	Bali	2,588	931	6,636	12.1	4.3	31.0
15.	West Nusatenggara	811	204	1,581	3.6	0.9	7.1
16.	East Nusatenggara	682	13	1,431	2.9	0.1	6.2
17.	West Kalimantan	1,120	194	4,845	5.5	1.0	23.8
18.	Central Kalimantan	140	2	757	2.0	0.0	10.7
19.	South Kalimantan	2,130	68	6,057	12.4	0.4	35.4
20.	East Kalimantan	2,189	55	4,576	29.6	0.7	61.9
21.	North Sulawesi)	2,724	286	5,634	10.3	1.1	21.2
22.	Central Sulawesi)						
23.	South Sulawesi)	3,827	606	21,229	6.4	1.0	35.7
24.	Southeast Sulawesi)						
25.	Maluku	322	68	1,059	2.9	0.6	9.6
26.	West Irian	1,536	66	2,179	16.5	0.7	23.4
	Indonesia	259,282	22,797	528,079	21.5	1.9	43.8

Note: Based on the estimated end year population.

Source: Head office of State Police

proportions moving by sea over smaller coastal distances (see Appendix Table A.29). These facts would indicate that other than purely economic factors are influencing the decisions of shippers along this corridor. An indication of the extent of price distortion through invisible payments is the fact 1/ that rice is shipped from Jakarta to Palembang by rail and ferry although published rail tariffs are 133% higher than published sea tariffs for that haul, with little difference in time.

145. Generally, however, inefficiencies in the shipping system probably have had less serious effects on trade and communications in Java and South Sumatera than in other areas because of the alternative modes available. The TCAS consultants have estimated that railways carry about 7% of the passenger traffic and 9% of the freight traffic on Java, while an IBRD mission estimated that railways carry about one-third of the intercity passenger traffic 2/ and two-fifths of the intercity freight traffic on Java. The difference arises because road transport in Indonesia is basically short-haul (137 kilometers average haul) and intra-provincial, even on Java (see Appendix Tables A.30 and A.31). Road freight traffic basically consists of building materials for consumption there or for interisland and international export, and imports from abroad or other islands (machinery, petroleum products, fertilizers) moving from ports to surrounding rural areas. The railroad naturally carries a relatively high proportion of intercity freight traffic because of its cost advantages on longer hauls (245 kilometer average haul for railway freight on Java), primarily distributing imports and domestic manufactures and carrying agricultural and wood products assembled in the larger cities of East and Central Java (especially Surabaya) to Jakarta.

146. The finding that the railroad carries a smaller proportion of total intercity passenger traffic than freight traffic agrees with TCAS data showing that 80% of rail passengers on Java travel third-class and that the average haul per third-class passenger on Java is only slightly more than 20 kilometers. This heavy short-haul traffic may be due to the very low third-class fares, the comfort advantages over extremely overcrowded buses and three-wheeled "bemos", and the avoidance of traffic congestion on commuter runs to Jakarta, Bandung, Surabaya and several Central Java cities. Third-class traffic is especially heavy in Central Java (over 15 million passengers in 1971), and this may be related to the very small number of cars and buses per capita in that province (see Table 22). Still, as Table 23 indicates, the Indonesian railway does not seem to be an important passenger carrier when compared to several other railways in the region, either in terms of the number of passengers per head of population or in density of traffic per route kilometer. In the case of Peninsular Malaysia, it must be noted that that region has

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1/ Observed by the TSKT team.

2/ If recent TCAS estimates for railway passenger traffic are used, the railway share drops to 20% of intercity passenger traffic.

nearly ten times as many cars and motorcycles per capita as Java, has a very well-developed system of intercity buses and taxis, and that the Malayan Railway has an average length of haul per passenger several times larger than that of the railway on Java.

Table 23: PASSENGER TRAFFIC INDICES FOR SELECTED ASIA RAILWAY SYSTEMS

Country	Passengers carried per head of population	Passengers carried per Route kilometer
Taiwan	8.45	125,000
Sri Lanka	6.84	55,700
Korea	4.12	41,720
India	3.33	28,677
Burma	1.67	14,964
Thailand	1.35	12,817
Malaysia	.56	3,063
Indonesia	.45	7,534
(Java)	.63	8,333

Source: Based on data from Jane's World Railways, 1972-73.

147. Freight traffic in Sumatera is extremely port-oriented (to Medan, Tanjung Karang, Padang, Palembang, Pekan Baru, etc.) both because of the export-orientation of that island and because of the extreme difficulty of overland transport, particularly from the three southern provinces (Lampung, South Sumatera and Bengkulu) to West Sumatera and from the west coast to the east. Road traffic in Kalimantan, Timor, Irian, Sulawesi and the other islands (excluding Bali) is negligible except in the rather immediate vicinity of large ports (Ujung Pandang, Banjarmasin, Pontianak and Manado) and is almost never inter-provincial in the character.

148. The distribution of major (i.e. national and provincial) roads is given in Table 24, along with the route-length of the railway system. These data should be handled with care, however. Many paved roads, particularly in the Outer Islands, are passable only with great difficulty either because of deteriorated pavement or bridge wash-outs, while the rail system on Sumatera is not an integrated one but rather four separate systems. A brief discussion of highway traffic volumes is given in Appendix D.

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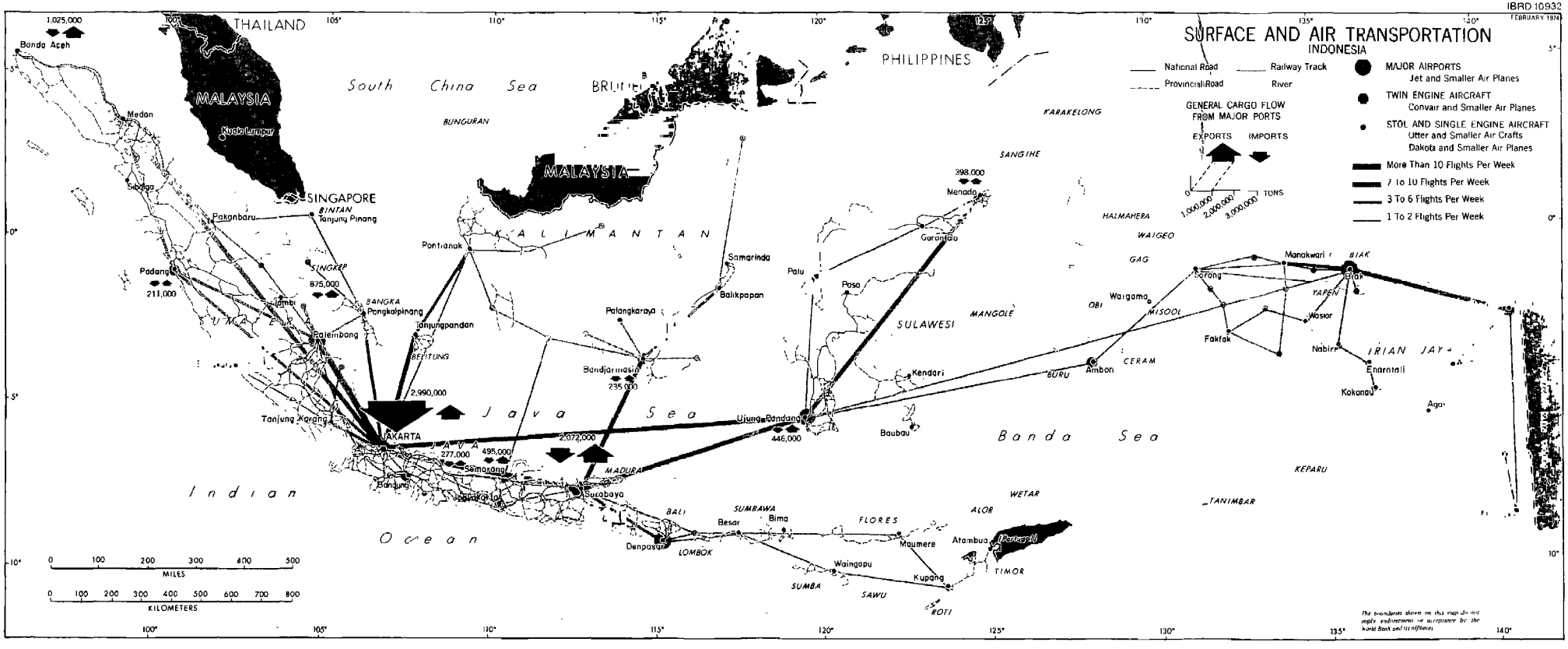

The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.

Table 24: LENGTH OF TRUNK ROADS AND RAILWAY TRACK, 1970, BY REGION (kms.)

Region	Central Government and Provincial Roads Asphalted	Non-Asphalted	Railway Track
Java and Madura	6,494	1,999	4,684
Sumatera	3,530	9,468	1,956
Kalimantan	483	2,301	-
Sulawesi	828	3,719	-
Other Areas	1,156	2,843	-
Total/a	12,491	20,330	6,640

/a 46% of total length of Central Government roads are asphalted, while 35% of Provincial roads are asphalted. Of the 51,000 kilometers of Kabupaten and other roads (not shown here), only 11% are asphalted.

Source: Statistical Pocketbook of Indonesia, 1970-71, pgs. 324, 240.

149. Given the geography of the country it is quite natural that air traffic is an important component in the passenger transport system, with 845,000 passengers in 1971 and a growth rate of about 35% per annum from 1969 to 1971. 1/ As might be expected, air traffic is heavily concentrated on Jakarta, which accounted for 37% of all originating passengers in 1971, a figure which is understated because of the necessity of changing planes in Surabaya, Ujung Pandang or other points on trips from Jakarta to the eastern islands. Surabaya accounted for 15% of total originating passengers and two-thirds of these were bound for Jakarta. The concentration of traffic on Jakarta is due to the role of the Government in the economy and to administrative centralization.

150. The eastern islands cannot depend on reliable scheduled services even in the field of air transport, with frequent last-minute cancellations of flights even by the national flag-carrier, Garuda. This, coupled with poor telecommunications and mail service, compound the isolation of several outer island provinces and often force them to fall back on official government radio links to maintain communications with the rest of Indonesia.

1/ This discussion of air travel is based on data recently compiled by TCAS.

151. Much of the investment in transportation over the last few years and much of the investment planned for the near future has been rehabilitatory in character. The reason for this approach is that all of the major transport modes have suffered from insufficient maintenance and investment over the post-war period, and this has contributed to the especially serious deterioration of service in the outlying or marginal areas reached by each mode, i.e. roads in Sumatera and Sulawesi; railroads in Aceh, West Sumatera 1/ and South Sumatera; siltation of ports and rivers in Kalimantan and eastern Sumatera; and shipping in the eastern islands. There are still many obvious candidates for rehabilitation projects in all modes of transport, but attention should be given to three points in formulating and selecting projects:

(a) the necessity for rehabilitation in view of changing patterns of economic activity and transport requirements;

(b) the effect specific projects and programs for different modes will have on regional patterns of investment, and vice versa; and

(c) the organizational improvements necessary to ensure that new additions to capacity will be utilized, maintained and replaced (on an ongoing basis) more effectively than formerly.

152. In regard to the first point, there are developments on the horizon which will both increase and decrease freight traffic in Indonesia in the next few years. New cement plants in Cibinong and Cilacap (as part of the national plan for major cement production facilities in each of the country's principal development region) will severely cut into rail carriage of cement from the Gresik plant near Surabaya to Jakarta and West and Central Java, 2/ while the PERTAMINA refinery complex to be built at Cilacap and the pipeline to be built from that complex will cut into the carriage of the railway's major freight commodity group. 3/ A

1/ The railways in these two provinces receive revenues equal to about 10% of their operating expenses.

2/ TCAS data indicate that cement accounted for 5% of major commodity tonnage carried by rail on Java in 1971, and with an average haul of 611 kilometers, for 12% of ton-kilometers.

3/ Petroleum products accounted for about one-third of major commodity tonnage carried by rail on Java in 1971, while the single haul from Jakarta to Bandung accounted for about one-tenth of total rail ton-kilometers for major commodities according to TCAS estimates.

general explanation for this trend may be that, as development (and import-substitution) proceeds, increasing demand for both consumer and intermediate goods may provide the economies of scale necessary to justify industrial investments in more and more regions, thus diminishing the long-haul transportation requirements along certain routes.

153. On the other hand, the drive for national self-sufficiency in rice, if successful, will mean an increase in domestic transport requirements, both by land, from East and Central Java to West Java, and by sea, from East Java and South Sulawesi to most of the outer-island provinces. Import-substitution in new and newly-protected fields of manufacturing will probably increase domestic sea transport requirements since the first establishments will probably be concentrated in a few port-cities (e.g. the flour-mills in Jakarta, Surabaya and Ujung Pandang) which permit easy access to imported raw materials and easier distribution to other islands. Land transport requirements will not be increased by this form of development, since the imported finished product would have to be distributed inland from ports 1/ anyway.

154. The second point brings transportation planning directly into the issues of regional planning, particularly the issue of efficiency of investment as opposed to regional equity in development expenditure. Many agencies of the GOI are deeply and sincerely concerned with this question, including the central planning agency (BAPPENAS), the Highway Department (Bina Marga), and the Directorate General of Sea Communications. The planners of Bina Marga, for example, have realized that selection of road projects entirely on the basis of benefit-cost criteria would lead to a concentration of almost all projects on Java, 2/ which would be impossible politically and probably indefensible from a long-term development point of view. Not wishing to completely abandon benefit-cost criteria (and with it probably any attempt at rational project selection), they have proposed and attempted to use a system of varying cost-benefit ratios as selection criteria for highway projects in different regions. 3/ If this system can be made to reflect regional priorities accurately, it should be used not only for highways but for other modes as well. If the planning for only one mode consciously follows the regional priorities enunciated by BAPPENAS, the result will be distortions of the modal shares

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1/ The five international base ports -- Jakarta, Surabaya, Medan, Ujung Pandang and Padang -- are probably also the most likely candidates for large scale import-substitution industries.

2/ See the Appendix D.

3/ Dr. V.G. Bhatia, Economiston the UNDP transport team working with Bina Marga, remarked that these differing ratios may be justified on pure efficiency grounds since they can be used to account for development benefits neglected in the cost-benefit calculations.

of investment in different regions as well as of the regional allocation of public investment. Demanding higher C-B ratios or internal rates of return for all modes on Java than on Sulawesi, for example, would not only divert some road construction from the former to the latter, but would also increase the relative share in the total transport budget of shipping at the expense of railways, predominantly concentrated on Java.

155. In fact, the Directorate General of Sea Communications has commissioned a special task force from among the members of the TSKT team to study the shipping problems and needs of the eastern islands in conjunction with BAPPENAS. The economics of railroads do not permit the flexibility in regional allocation of investment enjoyed by either shipping or highways, so that their investment requirements must, in general, be evaluated in the context of the total transport requirements of the regions where the railroads are still capable of operating efficiently.

156. The third point is obvious but important, and has received considerable attention in IBRD project design to date. It is simply that the highways, bridges, merchant fleet, ports, dredging fleet, navigational aids, track, rolling stock and aircraft of the Indonesian transport system did not all deteriorate in quality by chance, and that much still serviceable capacity is poorly used, in terms of turn-around times, terminal throughputs and load factors. Maintenance procedures and organizational improvements have been emphasized in past Bank projects in transportation, and this trend of including funds and technical assistance for maintenance and reorganization in loans for additions to capacity should be encouraged.

157. The area where transport problems most clearly represent a bottleneck to regional development seems to be in the ports and dredging field. Organizational and physical port problems hamper international and inter-island trade as well as coastal and inland waterways traffic. The consequences of this include the increasing isolation of hinterlands from river ports and of those ports from international and national commerce. In other words, the development of vast, sparsely-populated river basins and the proceeds from several of Indonesia's important exports are both in part constrained by siltation of river mouths and the lack of regular dredging operations over the last two decades. One example of this situation is Pontianak in West Kalimantan, where a sandbar has in the last few years limited the size of ships entering the port to 500 tons. Most of the other large ports of Sumatera and Borneo face similar problems. The Nedeco Ports and Dredging Team is studying these problems as well as the organizational bottlenecks alluded to previously, but it may not be too early to urge the advancement of detailed feasibility studies for dredging and port facilities and rapid implementation of such high-payoff projects as are identified.

158. While many of Indonesia's major export ports are in need of immediate rehabilitation and dredging (or, perhaps, relocation), the river basins which they serve as outlets may form ideal units for longer-term regional or area planning. An obvious first step in this direction would

be focused resource inventory work in the priority river basins 1/ which would be integrated with inland waterways improvements and ports and dredging projects at the river mouths. Since supply prices for rubber, timber, and other export products, transport costs and potential freight volumes are inter-dependent, the only way to fully evaluate any of the components of river basin development is as part of a coordinated program. Nevertheless, data taken from an Indonesian Inland Waterways Feasibility Study recently completed by a Belgian team justifies an investment program almost solely on the basis of waste reduction in the shipment of logs, 2/ mainly in Kalimantan, despite the neglect of benefits which could be generated through integrated regional development programs. The attractive aspect of a program of this type is the possibility of high returns, both in terms of transport cost savings and of development benefits, at rather limited cost.

159. Two organization changes would permit much more efficient use of existing port and shipping capacity. The first would be the elimination of all taxes and duties on interisland shipping, perhaps under the rubric of the Wawasan Nusantara ("Integrated Archipelago") Principle proclaimed by the MPR (National Assembly) to guide regional planning in Indonesia. The second change would be to extend the business hours of port officials beyond the current six or eight hours a day and to simplify port-clearing procedures. According to many experienced observers of the Indonesian shipping industry, organizational changes like these may provide even greater returns than massive capital investments.

160. Of course, breaking the bottlenecks in ports and shipping is not an easy proposition. Along with the reformation of bureaucratic administration, the physical aspects of cargo handling, transfer and storage will have to be dealt with, and this will probably require substantial investment, 3/ as will the dredging of harbors and river channels. Also, many areas, like Timor, the south coast of Java, the Gulf of Gorontalo in Sulawesi, etc., are almost devoid of good natural harbors and will probably have to be served by either land-based lighters, lighters aboard ships, or highway networks to ports, depending on volumes of freight.

1/ For example, the GOI has almost no authoritative inventory information on the commercial value of the forest resources of Kalimantan, apart from petroleum probably the single most valuable natural resource of the country.

2/ These movements reach enormous volumes. For example, about 4.4 million cubic meters of logs (including a high proportion of sinkers) will move down the Mahakam River (East Kalimantan) in 1977, according to estimates of the Belgian team.

3/ According to W. Griffiths, Chief of the TCAS team, the volumes of sugar and rice handled by the port of Surabaya would probably justify investment in bulk-loading facilities.

161. Finally, it should be noted that accessibility is a necessary but not often a sufficient condition for regional development. A regular scheduled service to Timor, for example, would probably stimulate an increase in livestock exports, but it would be a small increase unless an integrated program of developing water resources and fodder crops were also implemented. In other words, except for the cases of natural resources attractive to international corporations, such as timber, petroleum and hard minerals, production constraints are probably only slightly less binding than accessibility constraints, and the former will have to be faced soon after the latter are eased. While no miracles should be expected from transport projects, however, industrial, agricultural and transmigration projects must be located with transport costs and access in mind and accessibility must be included in the design of projects and regional plans.

Education

162. Educational administration and planning have been tightly controlled from Jakarta. This centralization often has not permitted the adaptation of educational content and patterns to regional differences.

163. The allocation policy of the Central Government follows by and large the existing pupil concentration. In the case of routine expenditure this is self-explanatory. With regard to development expenditure, the Government does attempt to redress regional imbalances somewhat. The recent extraordinary release of Rp 18.8 billion for primary school construction is a case in point: although the program covered each of the 26 provinces and the more populous ones received the largest allocations, a special effort was made to relieve the situation in those nine provinces where lack of facilities was known to exclude sizeable numbers of children from primary education. However, no explicit policy has been announced to equalize educational opportunities among the provinces.

164. Existing patterns of provincial administration make comprehensive educational planning almost impossible. First, fragmented administrative control makes coordination difficult among levels and types of education. The provincial coordinator of the central government Department of Education (Perwakilan) shares his authority over primary education with the provincial Office of Education (Dinas Pendidikan). The central government through their Perwakilan controls curricula, books and evaluation of education while the Dinas controls salaries, buildings and equipment. Planning thus requires coordination between two offices which have exhibited little enthusiasm for coordination in the past. 1/ Programs for development of higher education are prepared by each institution and forwarded directly

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1/ Jogjakarta and West Sumatera are exceptions. There, each educational supervisor represents both the Dinas and the Perwakilan.

to Jakarta, thus bypassing completely the provincial administration. Religious schools have an entirely separate but parallel system of education. This separate control over various levels and types of education inhibits the articulation of plans between levels of education, e.g., linking the development of primary and secondary education.

165. Second, there is no institutional mechanism which would permit the integration of educational plans with provincial economic needs. For example, no attempt was made to reduce enrollments in primary teacher training institutions (SPGs) as a result of the 1968 embargo on hiring new teachers; consequently, a vast oversupply of primary teachers has emerged.

166. Third, existing data collection provides an inadequate basis for provincial educational planning. Although seventeen reports are collected regularly from schools, essential data are missing about important factors outside the education system. Data collected by the Bureau of Census are not sufficiently detailed for provincial planning. For example, no data are collected on the number of children who fail to enter school because of a lack of places, density of school age population or employment opportunities.

167. The Office of Educational Development (BPP) in Jakarta recently began a program to train provincial staff of the Perwakilans in planning techniques. As a result, several Perwakilans have created embryo planning units and draft provincial contributions were made to the Repelita II. This is a good start, but it does not solve the entrenched problem of coordination mentioned above and does little to integrate educational planning with overall provincial policies.

Health Services

168. In Chapter II, it was pointed out that the main problem with respect to the spatial distribution of health services is one of partially correcting the uneven distribution within rather than between provinces. It must be doubted if Indonesia could afford to completely remove intra-provincial disparities because of the high cost of doing so in sparsely populated areas, but greater consideration ought to be given to: (a) the integration of the various programs and services at the regional level; (b) the provision of rural clinics, staffed by paramedical personnel; (c) tightening up and enforcing the post-graduate requirements for the three-year service in the provinces to ensure that the rural, sparsely populated areas receive greater coverage than in the past; and (d) restructuring the training of medical and paramedical personnel to ensure a greater emphasis on the public health and the community development planning aspects of health services.

169. The Family Planning program which has got off to a fairly good start in Java/Bali, needs to be reinforced, particularly in Lombok. In the short and medium run productivity and output of food crops can

be increased in Java/Bali/Lombok through further rehabilitation of the irrigation systems, further intensification through the application of improved seeds and fertilizers and through some diversification. In the longer-run, however, due to the already small average size of holding (less than one half of a hectare in Java and Lombok, for example) and the inheritance laws, there is a limit on further productivity increases. Hence it is vitally important to step up the efforts in family planning in these areas particularly.

Tourism

170. Indonesia is a very beautiful country with a wide variety of scenery, ranging from palm-fringed, coral-ringed, white sandy beaches to afforested mountains, from green terraced rice paddies to rugged volcanic peaks. The people are friendly and extremely artistic, with Moslem, Hindu and Buddhist cultural and religious traditions going back centuries. The island of Bali is rightly the best known tourist attraction, but there are many other areas with considerable tourism potential.

171. The tourist statistics lack accuracy and coverage. However, it would appear that the rate of growth of foreign visitor arrivals in Indonesia has been high: over 50% a year between 1967 and 1972, but it has been a high growth rate from a small base of only 26,000 in 1967. Although the number of vacation visitors has probably increased at a faster pace than the number of business and other visitors, the business traffic, with 42% of the total inflow (in 1971), still constitutes the largest proportion, compared with 36% vacation and 21% other kinds of visitors.

172. Out of a total number of foreign visitors of about 220,000 in 1972, Bali attracted just over 60,000 directly with about another 20,000 coming to Bali via Jakarta and other ports of first entry. No distribution by area is available of the balance of 140,000. The other tourist vacation areas are the Medan-Brastagi-Parapat (Lake Toba) triangle in North Sumatera 1/ and Jogjakarta in Central Java, and the capital Jakarta with visits to Merak on the Sunda Straits, Pelabuhanratu on the south coast and places like Bogor in the mountains.

173. The future growth rate is difficult to project, partly because of uncertainties about how fast supply constraints are going to be removed and, more recently, because of uncertainties due to the energy crisis. Abstracting from the latter, the Bank's draft Appraisal Report on the Bali Tourism project points out that "the number of visitor arrivals to Singapore, Thailand and Hong Kong, three highly developed tourist destination areas in Southeast Asia, grew by 20% per annum on the average over

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1/ The number of foreign visitors arriving directly in Medan was 14,122 in 1971.

the last five years reaching 783,000, 821,000 and 1,082,000 respectively in 1972, of which over 60% were on vacation". The development of tourism in Indonesia is likely to be complementary to that of the three countries mentioned above, although parts of Indonesia, particularly Bali, are likely to attract some single destination tourists from Australia and Japan because of the relatively short air flights involved. Thus, much of Indonesia's tourism development will come from the inclusion of Indonesia in the growing Southeast Asia package tour trade.

174. How the likely continued high growth in foreign visitors will be spatially distributed will depend partly on the scenic, cultural and religious inheritance, partly on how quickly supply constraints in the other areas are overcome, and partly on the government's transportation policies, which may enhance or reduce accessibility. There can be little doubt that Bali offers a variety of tourist experience which cannot be matched elsewhere in Indonesia and will therefore continue to be the largest single tourism growth center. 1/ But there is considerable potential elsewhere. Mention has already been made to Jogjakarta, which is the center of the Batik trade, with the nearby 8th century Hindu-Buddhist temple of Borobudur and the Hindu Temple of Prambanan, and to the Medan-Brastagi-Parapat triangle. At the moment, most of the foreign visitors to Sumatera come from nearby Singapore and Malaysia, but with some upgrading of existing small hotels and the construction of new accommodation at Parapat and other sites on the shores of Lake Toba, together with some road improvements and boating, sailing, fishing facilities, the more distant foreign package tourists could probably be attracted. Sumatera has another area of tourism potential which may be even more attractive. This is the area of Padang/Bukit Tinggi/Danau (lake) Singkarak and Danau Manindjau, inland, up in the mountains. This area offers a combination of fresh and sea water bathing and sports, cultural interest in the matriarchal social system of part of the local population and great scenic beauty. However, before these areas could be developed seriously for tourists a number of higher class hotels/motels and other tourist facilities would have to be provided. Looking a little further ahead, there are a number of other possibilities, not the least of which are parts of Irian Jaya, particularly around Jayapura (beaches, mountains and scenic beauty). Wamena and Agats (primitive tribes and wood carving).

Public Finance and Regional Development

175. The fact that Indonesia is a unitary state is reflected in the financial relations between the central government and the regional governments, particularly the provinces, kabupatens and kotamadyas, and in the present extent of devolution of decision making. These relations are at present governed by Law 1 of 1957 on regional government and Law 32

1/ Currently the GOI limits the number of foreign airlines granted permission to fly directly to Bali.

of 1956 on regional finance, but a bill on Financial Relations between the Central Government and the Autonomous Regions, which will replace these laws, has been under consideration in Parliament since 1967. It is perhaps a reflection of the constitutional and administrative complexity of the issues involved that this bill has not yet been passed.

176. The regional governments depend largely on the central government for financing their routine and development expenditures. First one should identify the development projects directly financed by the central government (see Appendix Table A.32). Other central government support consists of direct subsidies to the provinces and transfer of certain tax receipts which are collected in the first place by the central government. The latter have until now consisted principally of the allocation of the export tax (ADO) and land tax (IPEDA). For a few provinces (notably East, Central and West Kalimantan) royalties and licence fees are also an important source of revenue. In addition, the development activity at kabupaten and desa levels is fostered through special subventions from the central government under the Inpres and Desa Programs.

177. The administrative capacity of the regional governments for raising revenue is generally quite limited and partly as a result of this the legal possibilities for taxation available to them are far from being fully exploited. Provincial taxes are confined mostly to household tax, vehicle tax and a tax on the change of the ownership of motor cars. Provincial tax revenues are also supplemented by retributions (i.e., charges for services provided) and sometimes, earnings of provincial enterprises, though frequently the costs of these activities have been seen to exceed the earnings. The current expenditures of the regional governments are therefore by and large met by transfers from the central government, which consist almost entirely of subsidies linked directly to the size of the regional administrations. In addition, the provinces also receive an insignificant share of the central government petrol tax.

178. Central government transfers in most cases account for more than three-quarters of provincial government current revenue, but this proportion varies widely, from more than 90% for such provinces as Central and South Kalimantan to less than 50% for Jakarta (see Table 25). The 1956 Law stipulates that the amount of the central government subsidy should relate not only to the number of civil servants employed by the regional government but should also take into consideration such factors as the region's population size, general level of prices and economic potential, etc. However, in practice, these considerations have not been fully reflected in the magnitude of the subsidy.

Table 25: COMPOSITION OF PROVINCIAL BUDGETS, 1972/73

	Rp million										Rp			
	Revenue			Expenditures			of Revenue		Central Gov't Transfer as % of Routine Expenditure	ADO Transfer as % of Development Expenditure	Total Expenditure Per Capita (Rp)	Development Expenditure Per Capita (Rp)	Central Gov't Transfer Per Capita (Rp)	ADO Transfer Per Capita (Rp)
	Total	Current	Development	Total	Routine	Development	Central Gov't Transfer	Transfer in lieu of ADO						
D.K.I. Jakarta	14,200	13,070	1,130	15,000	6,000	9,000	6,000	350	100.0	3.9	3,278	1,967	1,311	76
West Java	13,765	12,280	1,485	13,765	12,235	1,530	10,001	957	81.7	62.5	636	71	462	44
Central Java	14,947	14,270	677	14,947	13,026	1,921	11,383	490	87.4	25.5	683	88	520	22
D.I. Jogjakarta	2,704	2,647	57	2,704	2,538	166	2,215	10	87.3	6.0	1,086	67	890	4
East Java	15,072	13,094	1,978	15,075	13,272	1,804	11,472	1,388	86.4	76.9	591	71	449	54
D.I. Aceh	3,363	2,542	820	3,362	2,546	817	2,229	406	87.5	49.7	1,673	407	1,110	202
North Sumatera	11,076	5,798	5,278	11,076	6,315	4,761	4,672	4,990	74.0	104.8	1,672	719	705	753
Riau	3,200	1,933	1,267	3,199	1,595	1,604	1,505	1,072	94.4	66.8	1,948	977	917	653
West Sumatera	3,186	2,580	607	3,186	2,619	467	2,281	498	83.9	106.6	1,141	157	817	178
Jambi	2,748	1,769	979	2,748	1,103	1,644	1,001	885	90.8	53.8	2,732	1,634	995	880
South Sumatera	7,429	3,095	4,334	7,429	2,371	5,058	2,021	4,159	85.2	82.2	2,157	1,489	587	1,208
Bankulu	986	889	97	986	786	200	801	35	101.9	17.5	1,900	385	1,543	67
Lampung	3,172	1,423	1,748	4,202	2,243	1,959	1,122	1,488	50.9	76.0	1,513	705	404	536
West Kalimantan	3,815	1,943	1,872	3,815	1,821	1,994	1,767	1,187	97.0	59.5	1,889	987	875	588
Central Kalimantan	2,933	1,914	1,019	2,933	1,883	1,050	1,662	321	88.3	30.6	4,190	1,500	2,374	459
South Kalimantan	2,526	1,694	832	2,526	1,716	810	1,593	605	92.8	74.7	1,487	477	938	356
East Kalimantan	5,608	2,491	3,117	5,608	2,713	2,895	2,114	898	77.9	31.0	7,640	3,944	2,880	1,223
North Sulawesi	3,119	2,450	669	3,119	2,305	814	1,960	397	85.0	48.8	1,815	474	1,141	231
Central Sulawesi	2,272	1,976	296	2,272	1,896	377	1,139	212	60.1	56.2	2,486	412	1,246	232
South Sulawesi	3,938	3,453	485	3,938	3,359	579	3,070	150	91.4	25.9	759	112	592	29
Southeast Sulawesi	1,226	1,074	152	1,226	730	496	986	113	135.1	22.8	1,717	695	1,381	158
Bali	1,721	1,601	120	1,725	1,608	117	1,363	82	84.8	74.5	814	55	643	39
West Nusa Tenggara	1,454	1,346	100	1,454	1,302	152	1,125	24	86.4	15.8	660	69	511	11
East Nusa Tenggara	3,106	2,929	177	3,106	2,906	200	2,621	134	90.2	67.0	1,353	87	1,142	58
Maluku	3,137	1,616	1,521	3,137	1,374	1,763	1,215	762	88.4	43.2	2,881	1,619	1,157	700
Total 1/	130,701	99,876	30,825	132,537	90,360	42,117	77,327	21,612	85.6	41.2	1,120	356	654	183

1/ Excludes West Irian.

Source: Department of Finance

179. A large part of regional development expenditure has been financed by ADO in the case of provincial goverrments and IPEDA in the case of kabupatens (and kotamadyas). Both of these taxes were originally collected by the central government in the first place and were transferred, after deductions for collection costs, to the regional governments. However, ADO is no longer related to the export tax collections, but is a special transfer to the regions from the GOI's general budget. For certain provinces (e.g., East and Central Kalimantan) royalties and license fees are the principal source of the development expenditure.

180. The main purpose of ADO (Allokasi Devisa Otomatis), or the automatic transfer of foreign exchange, was to encourage provinces to export. Until 1970, the allocation was related directly to provincial non-oil export earnings. Due mainly to the way the origin of exports was defined, i.e., the port of actual exports, it threatened disruption of the normal transport routes by making it attractive for the provinces to have their own port facilities. The ADO system was modified in 1971 to the extent that the central government transfers were only partially related to the region's exports, and this link has now been completely severed. The central government is currently transferring 105% of the amount of ADO received by individual provinces in 1969/70, but in future the transfers will be linked directly to the development needs of the province (see Chapter V).

181. IPEDA (Iuran Pembangunan Daerah) or land tax is related to land productivity and amounts roughly to 5% of the net income from land. It combines two land taxes, one relating to agricultural land and the other to urban land, which were formerly collected for the central government but were turned over in 1968 to kabupatens. The latter now receive 80% of the amount thus collected after deductions of 10% for collection costs and 10% for the provincial governments, but it is still a national tax with the central government deciding how the money should be spent.

182. There are two programs which combine the financial control of the Center with decentralized decision-making at the kabupaten/kotamadya and desa level. The kabupaten local public works program was initiated by Presidential Instruction (hence the name Inpres program) in 1970 to encourage participation at grass roots level in a program designed primarily to generate employment. The program covers the entire country and each kabupaten (regency) or kotamadya (municipality), which together number 281, is entitled to a direct central government grant strictly on a per head of population basis. The public works programs are chosen and designed by the Bupati, but have to be approved by the provincial governments and BAPPENAS before being funded. Inpres funds are made available only for the work actually performed and the chosen project must be approved and completed within a given fiscal year. The types of projects undertaken have until now been mostly rehabilitation and construction of roads, bridges, and minor irrigation works.

183. The Inpres program has proved very successful and the GOI has over the years raised the per capita allocation from Rp 50 in 1970/71 to Rp 100 in 1972/73 and Rp 150 in 1973/74. The program is planned to be further expanded in size and scope in the Second Development Plan period.

184. While the allocation of funds under the Inpres Program is based on the size of population, under the Desa Program the central government extends support to village programs by means of a flat transfer of Rp 100,000 per annum to each desa. The central government transfers are almost invariably matched by an equal distribution by the desa itself through "gotong rojong" (or mutual help) and the supply of local materials. These projects also are mostly for the building of roads, bridges and minor irrigation facilities.

185. Though the government development expenditures include expenditures which could not conventionally be regarded as productive investment, they do provide a guide to the regional orientation of Central Government policies and the capacity of the regional governments to undertake development expenditure.

186. The planned development expenditures of the different levels of administration for 1969-72 are given in Table 27. These data show that, in general, the contribution of the central government to the development effort has been considerably more than the combined total of the expenditure incurred by the regional governments (i.e. provinces, kabupatens and desa administrations), and accounted for a little under 70%. However, the central government's share in the total development expenditure shows a marked variation among the provinces. The share is highest for provinces of Java, Bali and Nusa Tenggara. With the exception of Jakarta, this was so not because per capita contribution by the Center was higher in these provinces, but because the provincial government development expenditure was relatively small (ranging from Rp 155-337 per capita). On the other hand, in the provinces of Kalimantan (except South Kalimantan), as a result of large royalties from timber exports, the development expenditure of the provincial governments has been considerably more than that of the central government.

Table 26: DEVELOPMENT EXPENDITURE OF PROVINCES

		Rp million					Rp	
		1969/70	1970/71	1971/72	Budget 1972/73	Annual Average 1969/70-1971/72	Per Capita Annual Average 1969/70-1971/72	Per Capita Annual Average less ADO Transfer
1.	D.I. Aceh	473	541	433	685	482	240	38
2.	North Sumatera	3,762	3,119	6,524	4,760	4,468	675	-78
3.	West Sumatera	240	549	373	467	387	139	-39
4.	Jambi	444	1,010	1,145	1,640	866	861	-19
5.	Riau	1,158	1,971	1,986	1,604	1,705	1,038	385
6.	South Sumatera	3,342	6,291	5,437	5,058	5,023	1,458	250
7.	Bengkulu	279	506	182	189	322	620	553
8.	Lampung	1,083	1,381	1,408	708	1,291	465	-71
9.	D.K.I. Jakarta	3,805	4,600	6,329	9,000	4,911	1,073	1,149
10.	West Java	523	824	701	1,530	683	32	-12
11.	Central Java	1,009	1,236	1,250	1,921	1,165	53	31
12.	D.I. Jogjakarta	n.a.	n.a.	74 1/	166 1/	74 1/	30	26
13.	East Java	982	1,447	902	1,760	1,110	69	15
14.	Bali	291	314	264	117	290	137	98
15.	West Kalimantan	1,073	1,839	1,073	1,997	1,328	657	69
16.	East Kalimantan	333	1,628	907	2,895	956	1,302	79
17.	Central Kalimantan	393	602	759	1,100	585	836	377
18.	South Kalimantan	378	439	575	810	464	273	-83
19.	North Sulawesi	721	1,121	980	980	941	548	317
20.	Central Sulawesi	463	936	666	377	688	753	521
21.	Southeast Sulawesi	245	388	468	440	367	514	356
22.	South Sulawesi	446	501	411	579	453	87	-71
23.	West Nusa Tenggara	144	161	122	152	142	64	53
24.	East Nusa Tenggara	22	101	125	200	83	36	-22
25.	Maluku	345	728	768	1,734	614	564	-136
26.	Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Total	21,954	32,233	33,862	40,868	29,398	247	64

1/ Budget.

Source: Department of Home Affairs

Table 27: PLANNED DEVELOPMENT BUDGET BY PROVINCES, 1969-72 a/

	Planned Development Budget					Planned per capita Development Budget b/				
	Central	Provincial	Kabupaten	Desa	Total	Central	Provincial	Kabupaten	Desa	Total
	(.....Rp Billion.....)					(.....Rp.....)				
DKI Jakarta Raya	123.0	23.5	1.1	.2	147.9	26,739	5,109	239	43	32,152
West Java	56.5	6.3	4.6	2.7	70.1	2.616	292	213	125	3,245
Central Java	39.2	3.4	5.1	3.5	51.1	1,790	155	233	160	2,338
DI Jogjakarta	8.8	.4	.6	.4	10.1	3,520	160	240	160	4,080
East Java	43.9	6.1	6.0	3.6	59.6	1,722	239	235	141	2,337
Java/Madura	271.4	39.7	17.4	10.3	338.8	3,566	522	229	135	4,452
DI Aceh	7.5	2.9	.5	1.0	11.9	3,750	1,450	250	500	5,950
North Sumatera	13.9	17.4	1.4	1.5	34.2	2,106	2,636	212	227	5,181
West Sumatera	11.6	1.6	.7	.4	14.3	4,143	571	250	143	5,107
Riau	4.5	6.6	.3	.4	11.8	2,812	4,125	188	250	7,375
Jambi	3.2	5.3	.2	.3	9.0	3,200	5,300	200	300	9,000
South Sumatera	14.8	16.1	.8	.7	32.3	4,353	4,735	235	206	9,529
Bengkulu	2.2	3.3	.1	.2	5.8	4,400	6,600	200	400	11,600
Lampung	7.1	5.2	.5	.5	13.3	2,536	1,857	179	179	4,750
Sumatera	64.9	58.3	4.5	4.9	132.6	3,120	2,803	216	236	6,375
West Kalimantan	4.0	8.6	.4	.7	13.7	2,000	4,300	200	350	6,850
Central Kalimantan	1.2	3.2	.2	.5	5.1	1,714	4,571	286	714	7,285
South Kalimantan	10.4	2.6	.4	.4	13.8	6,118	1,529	235	235	8,117
East Kalimantan	5.1	9.6	.2	.4	15.3	7,286	13,714	286	571	21,857
Kalimantan	20.6	24.0	1.2	2.0	47.8	3,961	4,615	230	385	9,192
North Sulawesi	6.5	2.6	.4	.5	9.9	3,823	1,529	235	294	5,882
Central Sulawesi	2.9	2.3	.2	.4	5.8	3,222	2,556	222	444	6,444
South Sulawesi	13.8	2.9	1.3	.6	18.6	2,654	558	250	115	3,577
Southeast Sulawesi	1.5	1.5	.2	.2	3.4	2,143	2,143	286	286	4,857
Sulawesi	24.7	9.3	2.0	1.7	37.7	2,908	1,093	232	195	4,428
Bali	6.9	.7	.5	.3	8.4	3,282	337	235	149	4,004
West Nusa Tenggara	2.0	.6	.5	.3	3.4	905	268	229	140	1,541
East Nusa Tenggara	3.7	.5	.5	.6	5.3	1,622	198	234	261	2,316
Bali/Nusa Tenggara	12.6	1.8	1.5	1.2	17.1	1,912	265	233	185	2,594

Table 27: **Continued**

	Planned Development Budget					Planned per capita Development Budget b/				
	Central	Provincial	Kabupaten	Desa	Total	Central	Provincial	Kabupaten	Desa	Total
	(.....Rp Billion.....)					(.....Rp.....)				
Maluku	3.2	2.0	.2	.4	5.9	2,898	1,841	203	389	5,330
Irian Barat	9.1	1.9	.2	.1	11.3	10,089	2,067	272	92	12,516
Maluku/Irian Barat	12.3	3.9	.5	.5	17.1	6,134	1,941	235	256	8,565
Indonesia	406.5	137.0	27.0	20.8	591.3	3,409	1,149	227	174	4,959

a/ Aggregate of fiscal years, April-March.
b/ Derived on the basis of 1971 census data.

Source: Bappenas

187. Excluding Metropolitan Jakarta and Irian Jaya as special cases, central government per capita expenditure varied much less widely and remained within the range of Rp 2,000-3,000 for most provinces. The central government regional bias, on the basis of this measure, seems nevertheless to be rather unfavorable to some of the poorest regions, viz., Central and East Java and the two provinces of Nusa Tenggara, in whose case the allocations amounted to considerably less than Rp 2,000. However, in some of these provinces the density of population is very high, and the creation of social and economic infrastructure usually requires less expenditures per head of population.

188. Since the bulk of their development expenditure is financed through a special central government subvention that is applied strictly on a per capita basis, the variation in the per capita development expenditure of the kabupatens is insignificant.

Spatial Aspects of Recent Trends: Summary

189. Some insight should now have been provided into the regional differences in the distribution of growth and development shown in Table 16 at the beginning of this chapter. Generally Sulawesi and Kalimantan are growing rapidly due to growth in forestry. Jakarta and West Java also are growing, the former largely on the basis of public administration, trade and services and the latter on the basis of rice, forestry and large scale manufacturing. The growth of Riau and West Sumatera also has been substantial, owing to the growth of forestry and mining. In these provinces, the growth of public administration and service sectors also is substantial, implying that the service sectors are catching up with leading productive sectors. Central and East Java are rather stagnant, as are West and East Nusa Tenggara. Although small and handicraft manufacturing establishments in Central and East Java are growing rapidly, the stagnation of non-food agriculture, large-scale manufacturing and trade are responsible for the slow growth of these provinces. In both provinces of Nusa Tenggara, slow growth is due to the stagnation of agriculture.

190. Some indications of the future growth of the provinces can be obtained on the basis of the approved investment projects (refer back to Table 17). Jakarta is expected to receive the largest increment in GDP. The growth will be led by the manufacturing, tourism and transportation sectors. Overspill of manufacturing activities from Jakarta, particularly textiles, will accelerate the growth of manufacturing, too. New fertilizer plants in West and East Java will help the development of agriculture there. Furthermore, a billet steel plant of 1 million ton capacity is planned in West Java. Central Java's growth will be supported by the development of an industrial estate in Cilacap, but will depend to a large extent on the growth of small-scale industry. More than 90% of manufacturing investment, by value, is concentrated in Java. In addition, Java will grow on the basis of the intensification in agriculture which will be made possible by on-going irrigation projects.

191. Sumatera's prospects for growth are good. The development of oil, forestry and new farm land will be the major sources of growth with new forestry development concentrated in Riau and Jambi, oil in central and southern Sumatera and estate development in North and South Suamtera and Lampung. There also are prospects for manufacturing development in South Sumatera.

192. Kalimantan's growth will be fastest in East Kalimantan where there is still plenty of forestry resources and there are reasonable prospects for oil exploration. Other provinces in Kalimantan also will grow on the basis of forestry and new agricultural development. Having one half of the nation's forest resources, Kalimantan's growth prospects are excellent, but sustained growth will depend on the establishment of wood processing plants and infrastructure to support them.

193. Sulawesi will grow on various fronts including nickel, other mineral and forestry development, intensification and expansion of farm crops such as rice, cotton, sugarcane, maize, cassava and soybeans and the development of livestock. Among the provinces, North and South Sulawesi will grow most.

194. Elsewhere, Bali will grow on the basis of tourism and the intensification of agriculture, Maluku due to forestry and Irian Jaya (West Irian) as oil, minerals and forests are developed. The prospects for the development of West and East Nusa Tenggara do not appear to be good, but the regional development study of Eastern Indonesia will hopefully reveal the comparative cost advantages of these islands.

195. To summarize, the growth of the Outer Islands will continue to be principally resource-oriented, whereas growth in Java will be based on existing human and infrastructure resources and concentrated in the manufacturing and service sectors. Large differences in population density among the major islands will not be a determining factor of the growth rate.

CHAPTER IV

THE IMPLICATIONS FOR DEVELOPMENT POLICIES

196. As stated in the Preface to Volume I, the Regional Planning Mission was concerned mainly to suggest a framework in terms of organization, procedures, methodologies and studies within which regional planning could be carried out more effectively. This volume was devised and written to provide both new spatial insights into the developing nature of the Indonesian economy and background data for the analysis of the objectives and needs of regional planning which is provided in Volume III. Inevitably, however, in the course of looking at the spatial dimensions of growth and development, certain questions arose having a bearing on development strategies and priorities which might not have come to light in the way they did on the basis of aggregate or sectoral economic analysis. So in this final chapter of Volume II, a few of these questions are put and briefly analyzed as hypotheses. They can only be put this was as further regional analysis is needed to test their validity. Before doing this, however, there is one important conclusion which can be stated with some degree of confidence. This is that the past emphasis on macro and sectoral planning in Repelita I tended to accentuate the regional disparities in growth and development. The virtual absence of effective regional planning and the relative inattention to the spatial aspects of sectoral planning made it difficult (a) to provide the economic and social infrastructure necessary for the growth of new and viable development centers; (b) to identify comparative cost advantages of production in the Outer Islands; and (c) to identify, prepare and implement projects in relation to regional growth potentials and cross-sectoral requirements -- the formulation and execution of transmigration schemes are a classic illustration. Hence the importance of the emphasis put on regional planning in Repelita II. This aspect is taken up again in Volume III.

197. Taking now each of the hypotheses in turn, the first is that the development of the Outer Islands has been significantly held back due to insufficient priority being given to rehabilitation and improvement of inter-island transport and communications. As the GOI now recognizes, there are natural major and minor growth poles or centers, the development of which will accelerate growth in their surrounding areas of influence, but the development of such growth poles has been inhibited by poor and often deteriorating transport and communications. Economic growth in the Maluku Islands, Nusa Tenggara Timor and in Nusa Tenggara Barat has been severely constrained by deteriorating transport which in turn has affected agricultural output, and so on in a declining spiral. The regional study of Eastern Indonesia now under way will hopefully provide the sectoral and regional planning data and analysis to provide the basis for a rehabilitation program.

198. The second hypothesis is also concerned with transport, this time with priorities within the transport sector. It appears that there is too much emphasis upon rehabilitating the railways in Java, too little emphasis

on road transport in Java and on inter-island sea and air traffic and practically no attention has been paid to transport modes which will open up, for example, the hinterlands of the resource rich islands of Sumatera and Kalimantan. Consider the geography of Indonesia. Many of its islands are relatively long and thin, and, in general, transport hauls are relatively very short. Railways are most efficient and economic for the long distance haulage of bulky goods. The longest haul on the railways is between Surabaya and Jakarta -- only 781 km -- yet coastal shipping freight rates are lower than rail rates. 1/ In general, therefore, even were they efficiently managed and operated with up-to-date rolling stock, it is questionable whether the railways would be a more efficient mode of transport for freight than roads and coastal shipping. Moreover, reference has already been made to deficiencies in inter-island transport and communications, but there are other transport possibilities which preliminary analysis indicates ought to have greater priority. Two illustrations are the institutional bottlenecks and dredging requirements at the ports and the opening up of the hinterland of large parts of Kalimantan and the north coast of Sumatera by river transport, which are referred to in paragraphs 157 and 158 above.

199. A good transport coordination study, provided it paid sufficient attention to geographic and spatial factors, would no doubt pick up many aspects of the two issues hypothesized above, but such a study would be much more effective if made on the basis of one or more regional development studies which integrate the sectoral aspects and bring out the spatial linkages.

200. A third hypothesis is that an important cause of the lack of success with the transmigration program has been the inability to locate transmigration projects in areas identified as having a high potential by regional development studies 2/, and because the multisectoral requirements of transmigration have been insufficiently studied, coordinated and implemented according to a carefully worked out phasing of the various components of the projects.

201. A fourth hypothesis is that the beliefs quite widely held in Indonesia and elsewhere that Jakarta is too large, is growing too fast and its expansion needs to be severely limited, are mistaken and not supported by the evidence. Not only is the growth rate relatively low compared with other capital cities in developing countries, but it is doubtful whether Jakarta has reached its optimum size in terms of the agglomeration economies being exceeded by the possible diseconomies of overcrowding, congestion and pollution. Attempts to limit further growth so far have not succeeded and

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1/ Much traffic is, however, diverted to the railways by the unnecessarily high charges in the ports which greatly exceed the costs.

2/ This has important implications for area development schemes and horizontally integrated rural development projects.

are unlikely to in the future. Energies and resources should rather be released to carrying out more effective town planning in Jakarta and in providing the economic and social infrastructure for other major and minor growth poles.

202. Finally, as an illustration of the way in which regional studies can make sectoral plans more realistic and effective, the case of the proposed trans-Sumatera highway is cited. No doubt in time there will be a highway connecting the southeast and the northwest extremities of Sumatera, but the GOI wisely agreed with the Bank's suggestion that the extent, class and location of the proposed trans-Sumatera highway should be determined in the light of regional studies. Accordingly, with assistance from the Federal Republic of Germany and IDA, a regional planning study of the southern half of Sumatera was mounted, and it is to be followed by a similar study of the northern half. In this way the intra-regional/inter-provincial transport needs in terms of wider regional economic and social requirements will be assessed to determine the nature and feasibility of any trans-Sumatera transport linkages.

203. The above are some illustrations of the way in which regional analysis can throw new light on both aggregate and sectoral planning. More extensive and greater in-depth regional planning, based on cross-sectoral and locational studies, would be likely to further improve the effectiveness of macro, sector and project planning in Indonesia.

A. CARTOGRAPHIC APPENDIX

MAPS

1. Rainfall
2. Terrain Classification
3. Soils
4. Land Use - Western Area
5. Land Use - Central Area
6. Land Use - Eastern Area
7. Minerals
8. Fishery Resources
   - Food Productivity in the Sea near and within Indonesia
   - Locations of known Fishing Grounds in Indonesia

Resource Inventory Index

1. Geodetic Network
2. Index of Aerial Photo Coverage
3. Index of Topographic Map Coverage
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5. Index of Forestry Inventory Map Coverage
6. Index of Land-use and Cadastral Mapping
7. Index of ERTS Imagery

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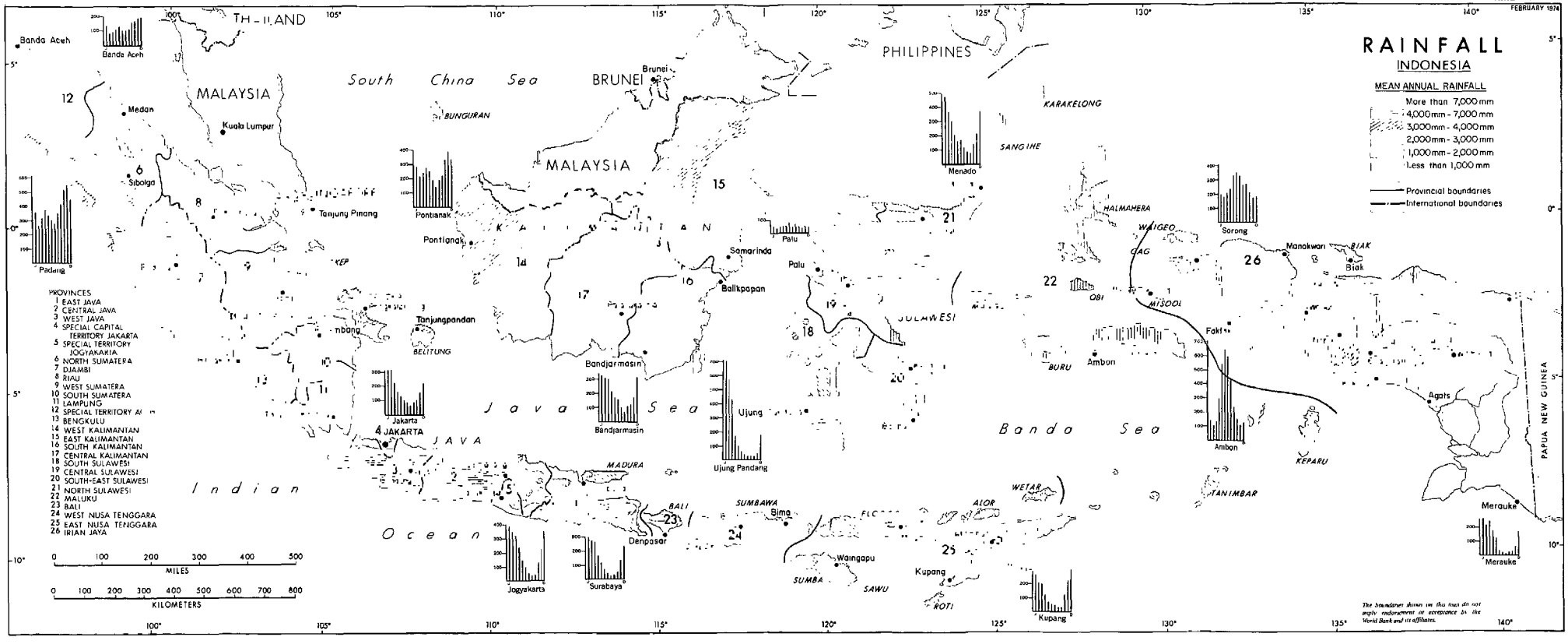

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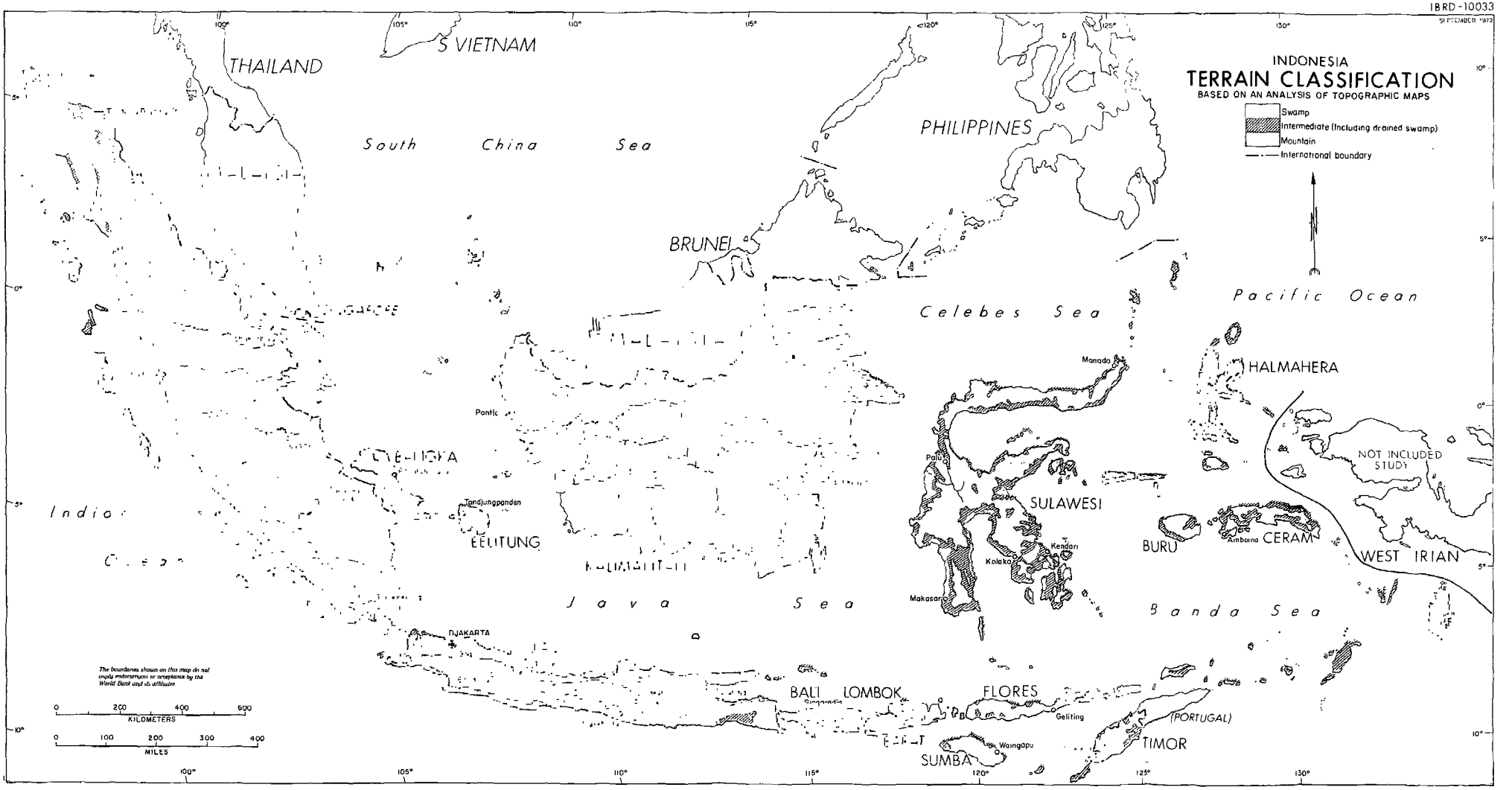

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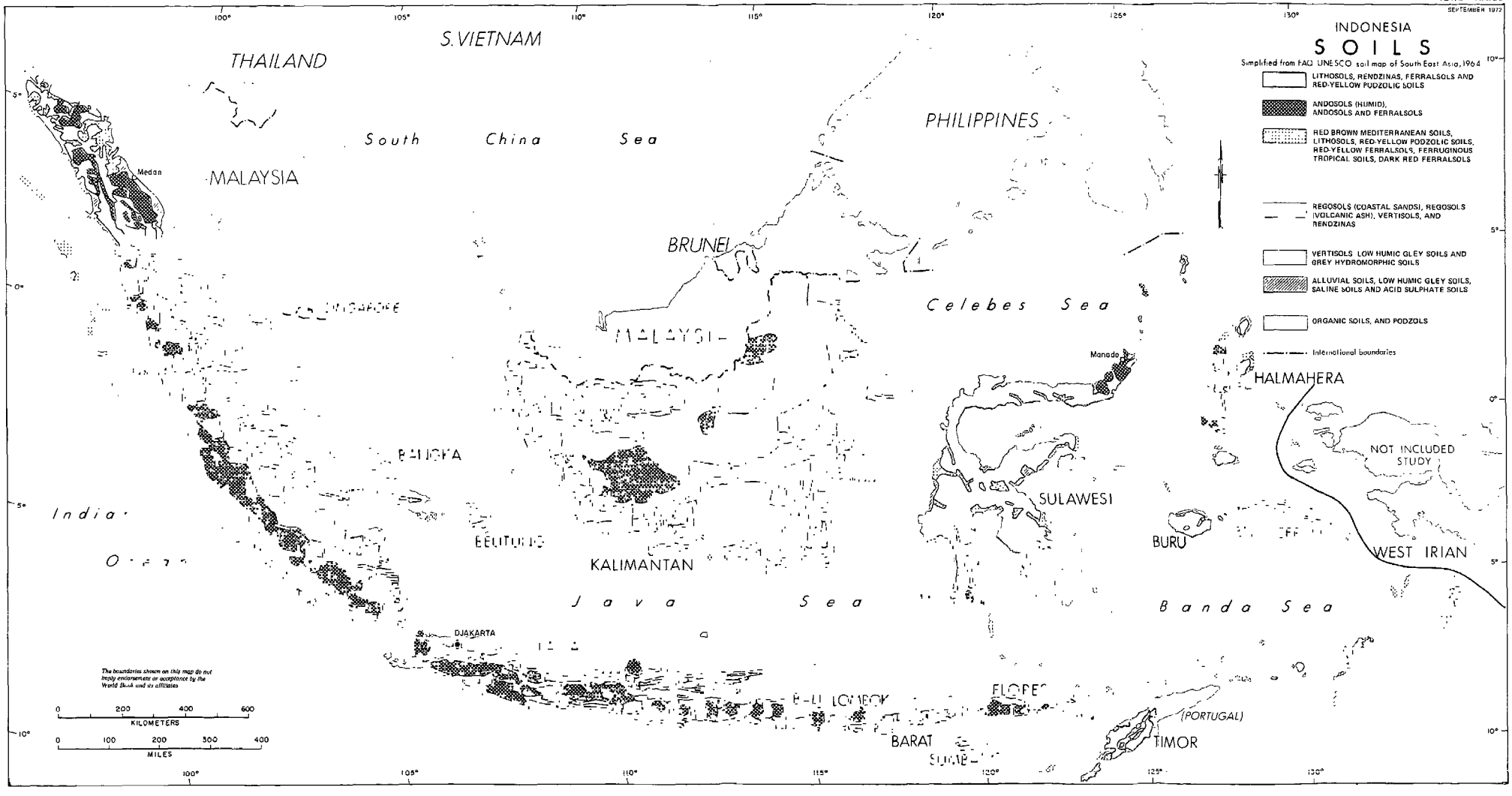

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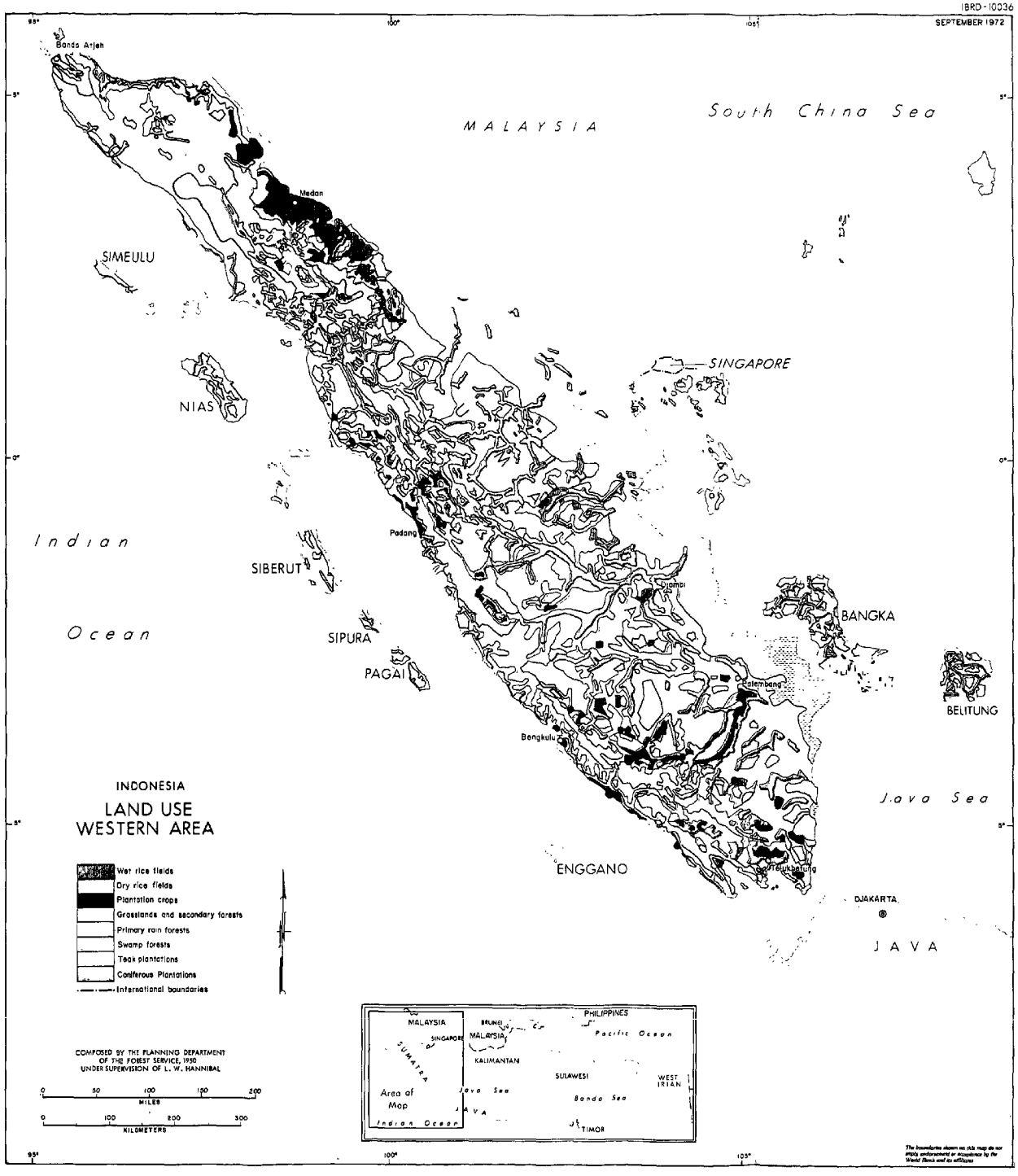

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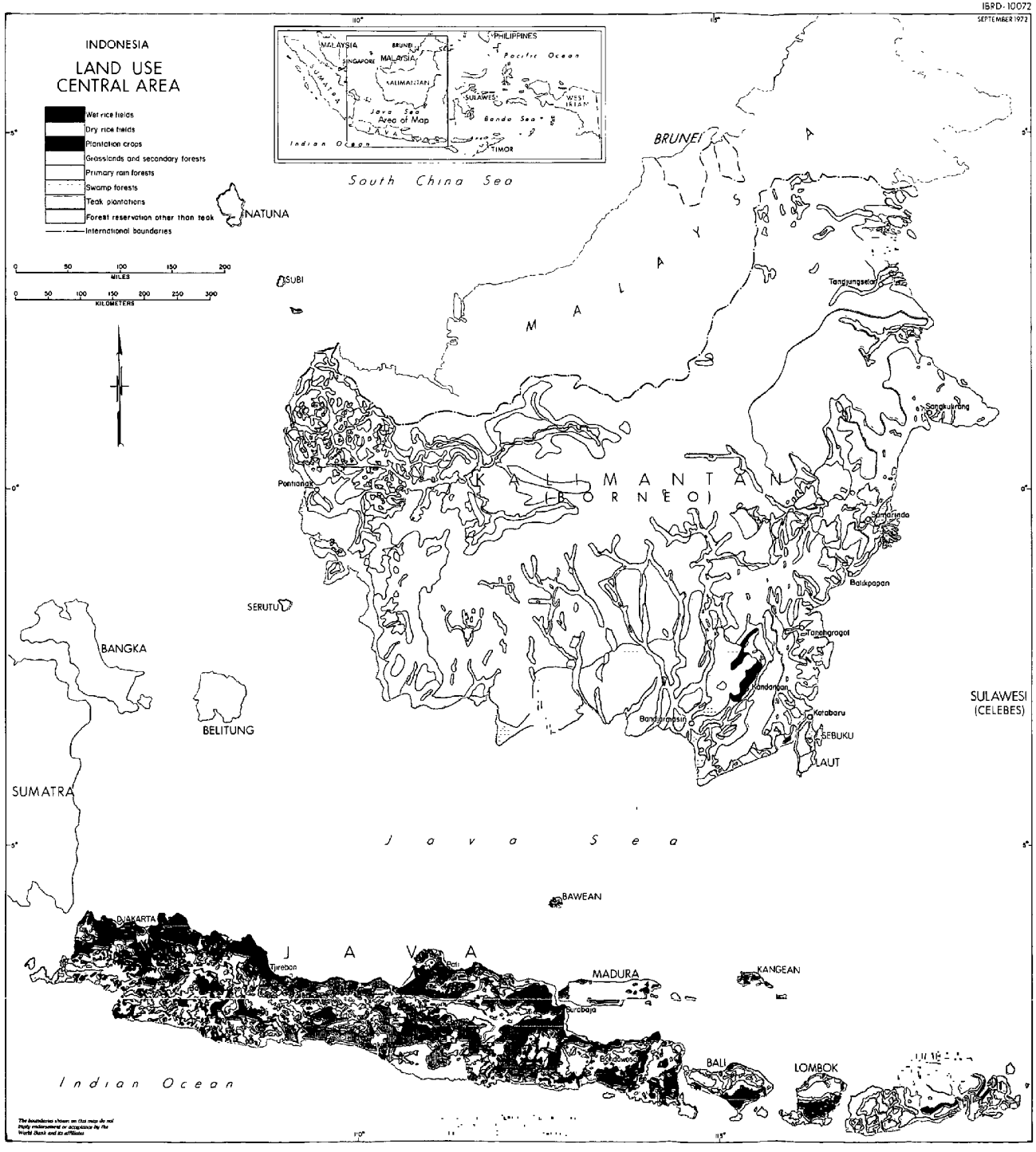

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INDONESIA

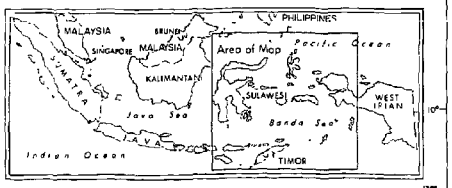
LAND USE EASTERN AREA

Wet rice fields
Dry rice fields
Plantation crops
Grasslands and secondary forests
Primary rain forests
Swamp forests
Teak plantations
Coniferous Plantations
International boundaries

0 50 100 150 200 MILES
0 50 100 150 200 250 300 KILOMETERS

Celebes Sea
Molucca Sea
Ceram Sea
Banda Sea
Flores Sea
Savu Sea
Timor Sea

KALIMANTAN
Kampungbaru
Manado
Donggala
TOGIAN IS
PELENG
BANGGAI
SULA ISLANDS
MANGOLE
TALIABU
SANANA
SULAWESI (CELEBES)
Palopo
Kendari
WOWONI
Watampone
Makassar
MUNA
BUTUNG
KABAENA
TUKANGBESI ISLANDS
SALAJAR
JANAHDJAMPEA
KALAOTOA
SUMBAWA
SAWU
ROTI
Kupang
TIMOR
PORTUGUESE TIMOR
TALAUD ISLANDS
SANGI
SIAU
MOROTAI
HALMAHERA
KASIRUTA
BATJAN
GEBE
WAIGEO
BATANTA
SALAWATI
(NOT INCLUDED IN STUDY)
QBI
MISOOL
BURU
CERAM
AMBON
WEST IRIAN
KAI KETJIL
KAI BESAR
TRANGAN
ARU IS
WORKAI
DAMAR
ROMANG
MOA
SERMATA
BABAR
LARAT
JAMDENA
SELARU



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COMPOSED BY THE PLANNING DEPARTMENT OF THE FOREST SERVICE, 1950 UNDER SUPERVISION OF L. W. HANNIBAL

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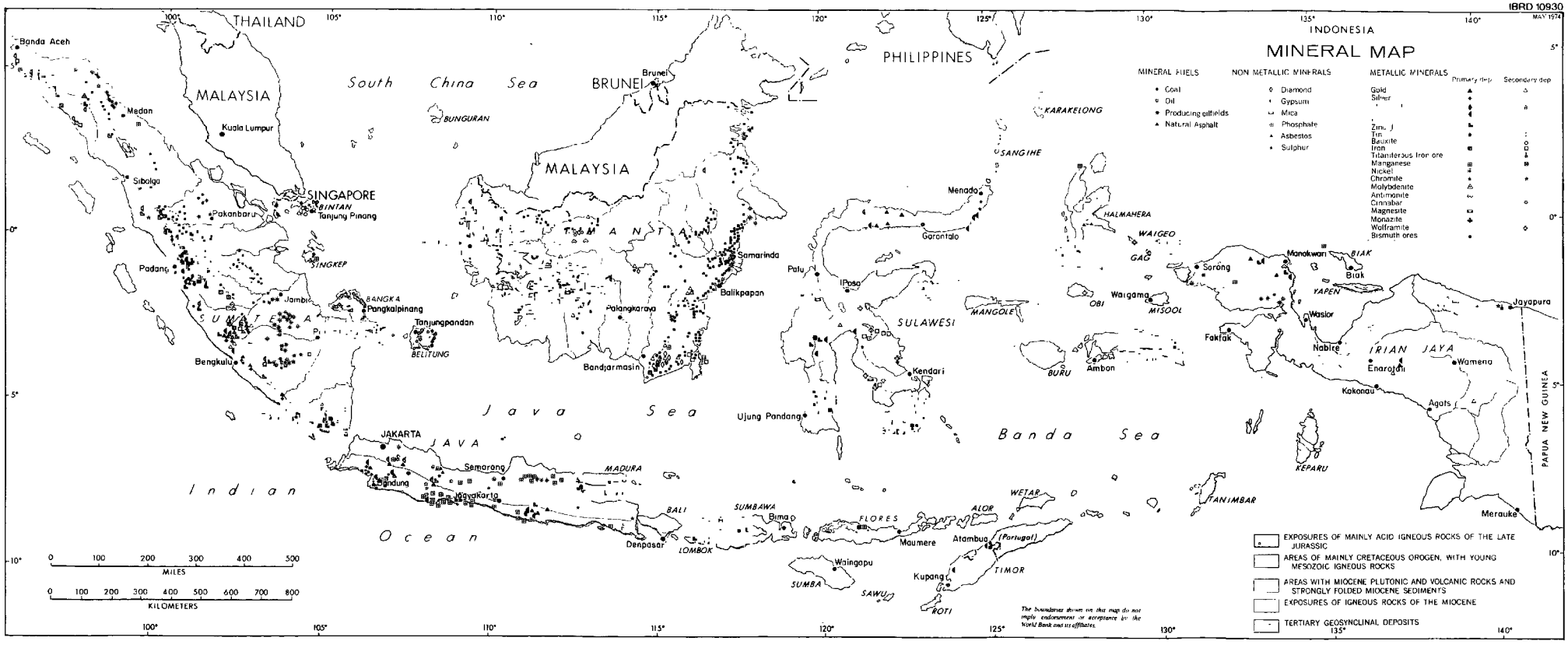
INDONESIA
MINERAL MAP



Food productivity in the sea near and within Indonesia.

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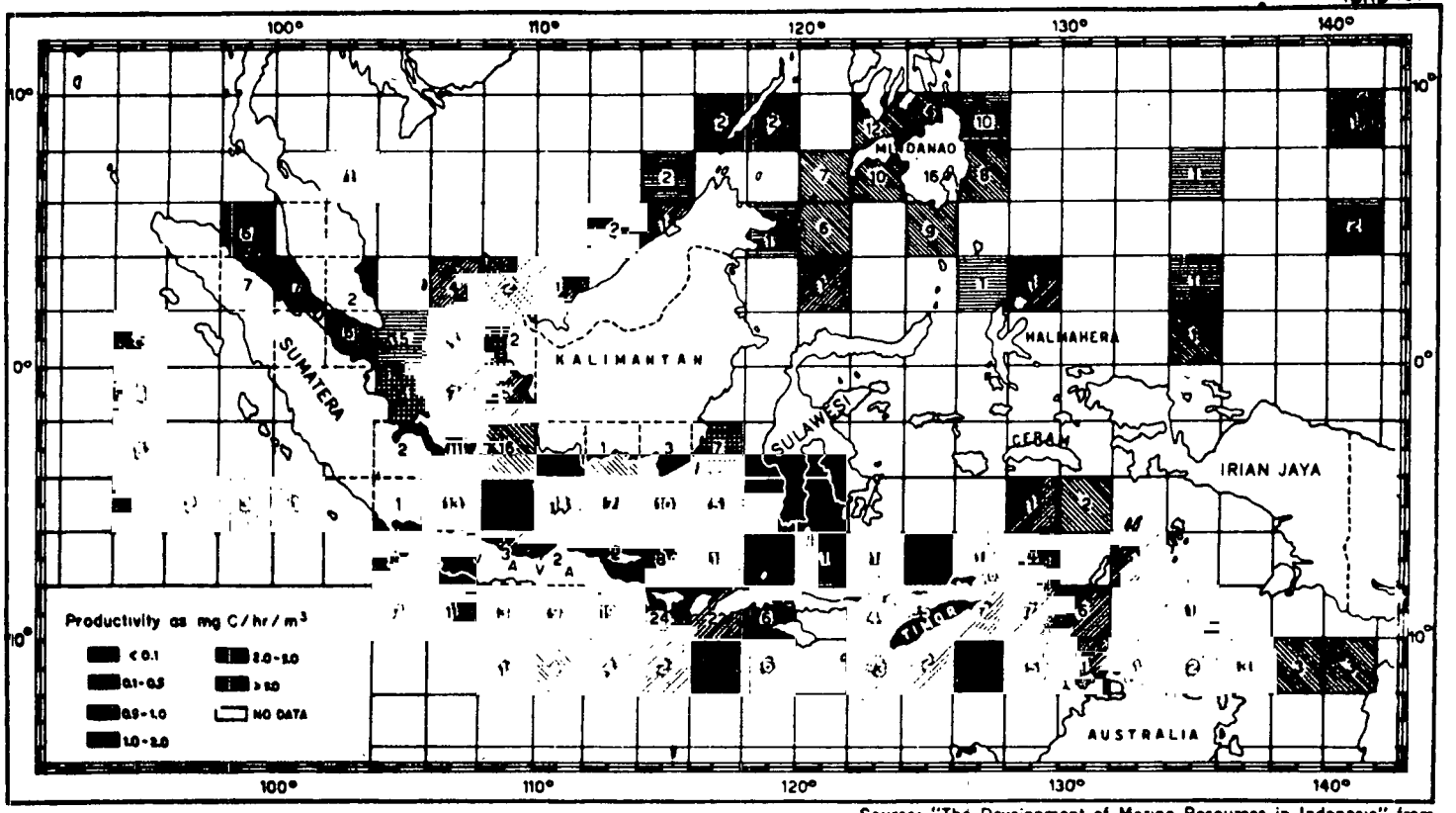
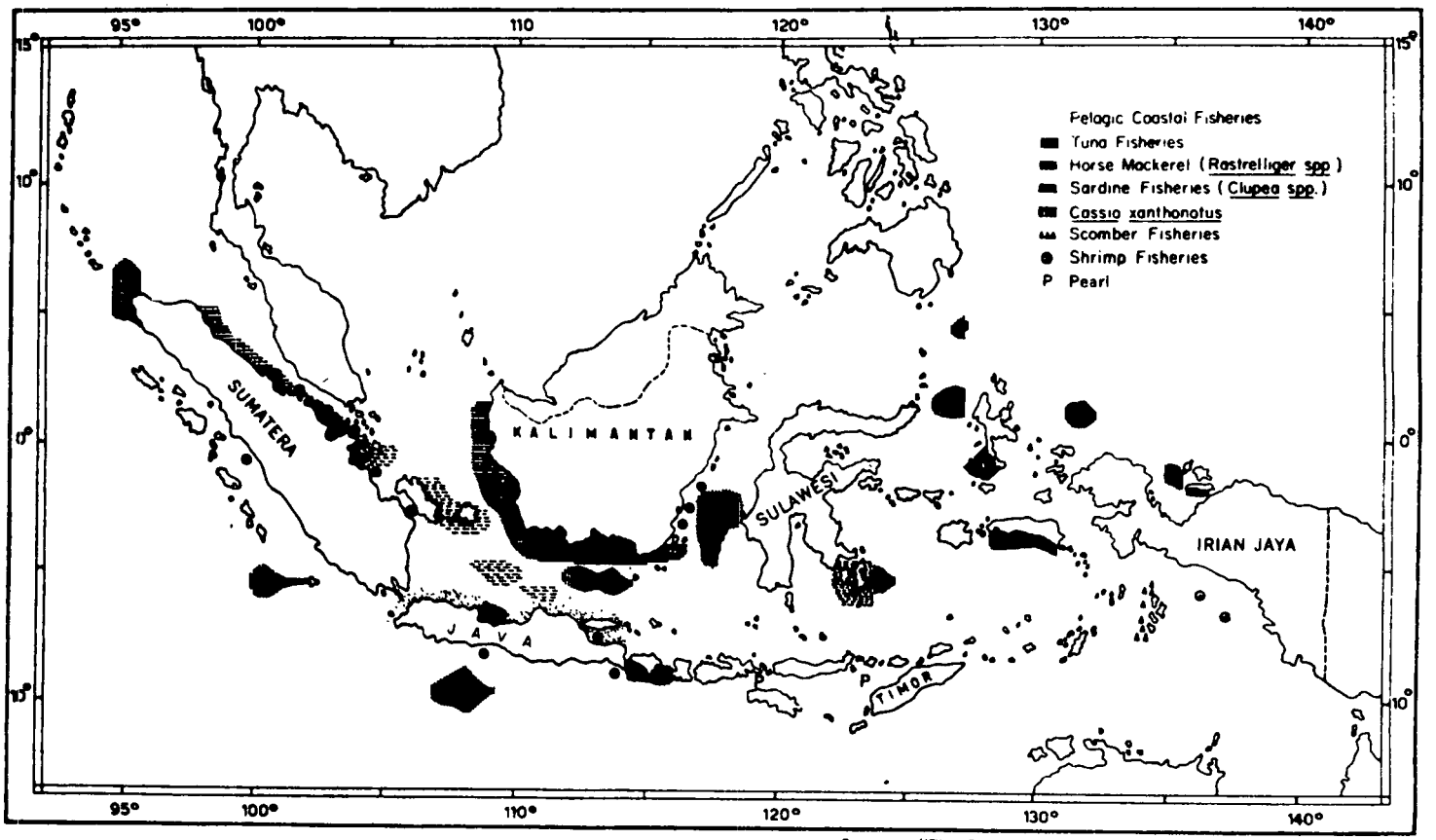


Source: "The Development of Marine Resources in Indonesia" from INDONESIA: RESOURCES AND THEIR TECHNOLOGICAL DEVELOPMENT by H. Beers 1970

Locations of known fishing grounds in Indonesia.



Sources: "The Development of Marine Resources in Indonesia" from INDONESIA: RESOURCES AND THEIR TECHNOLOGICAL DEVELOPMENT by H. Beers 1970

IKAN LAUT/MARINE FISH MAP by BAKOSURTANAL 1965

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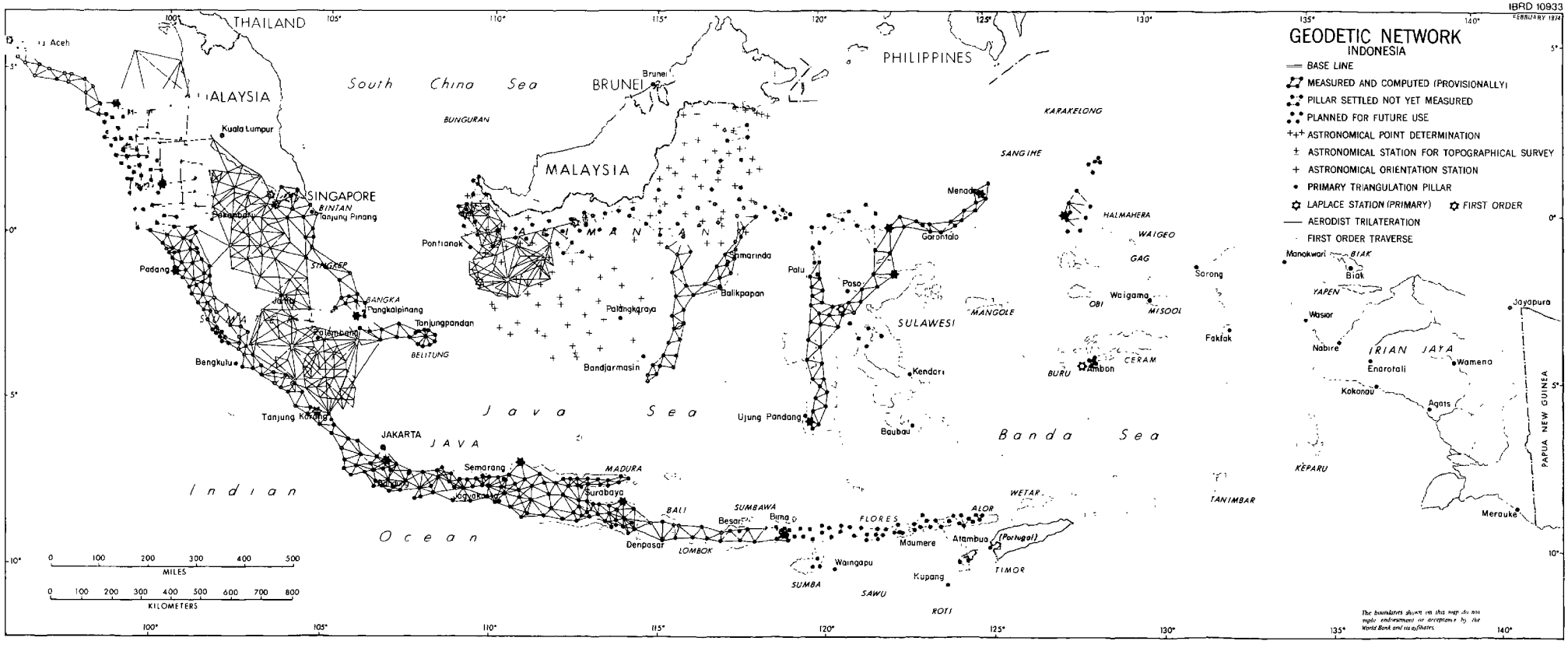

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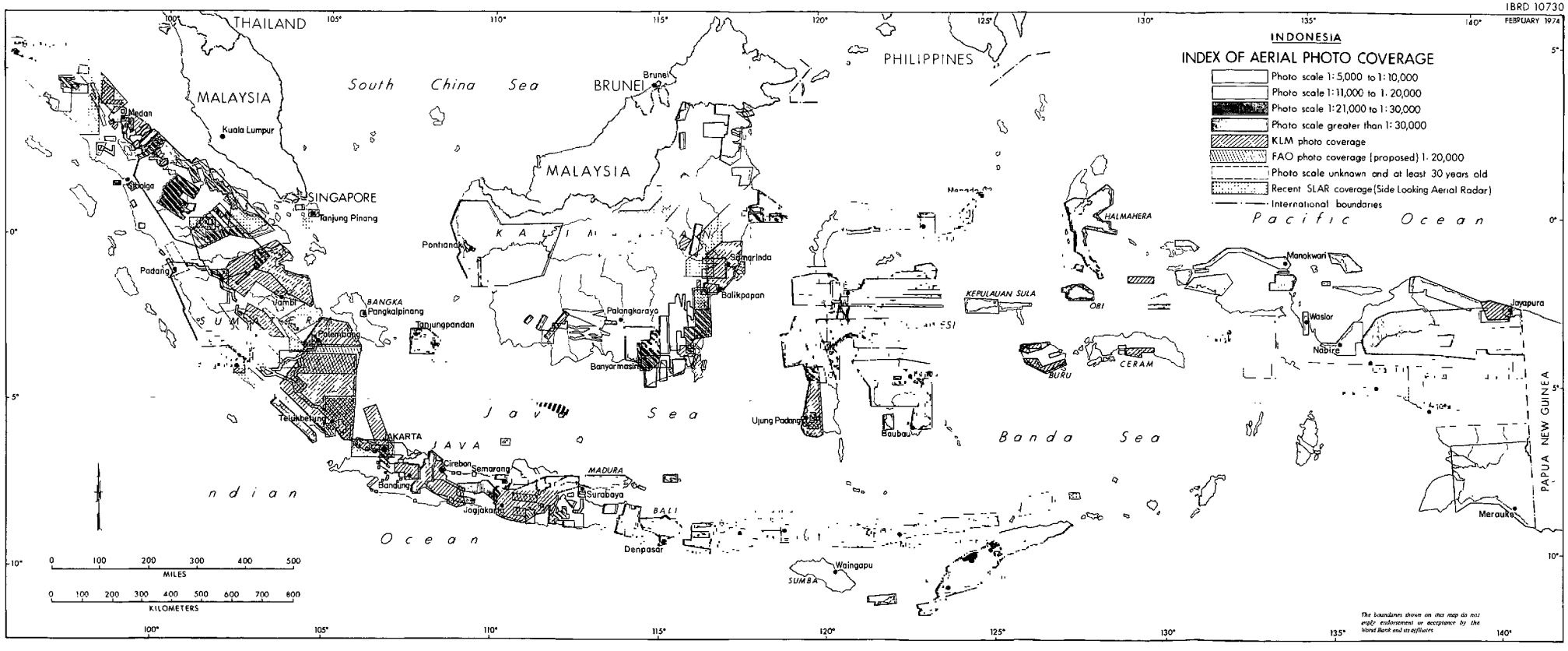

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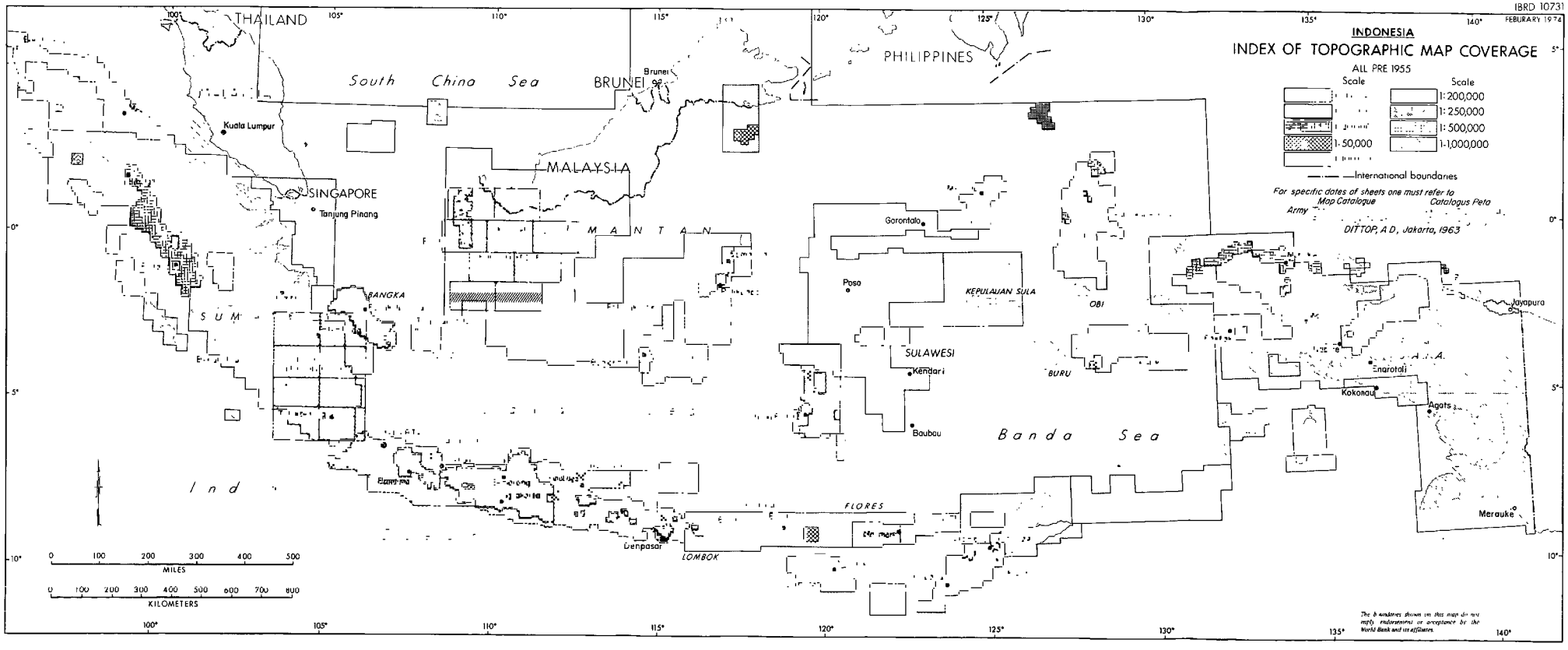

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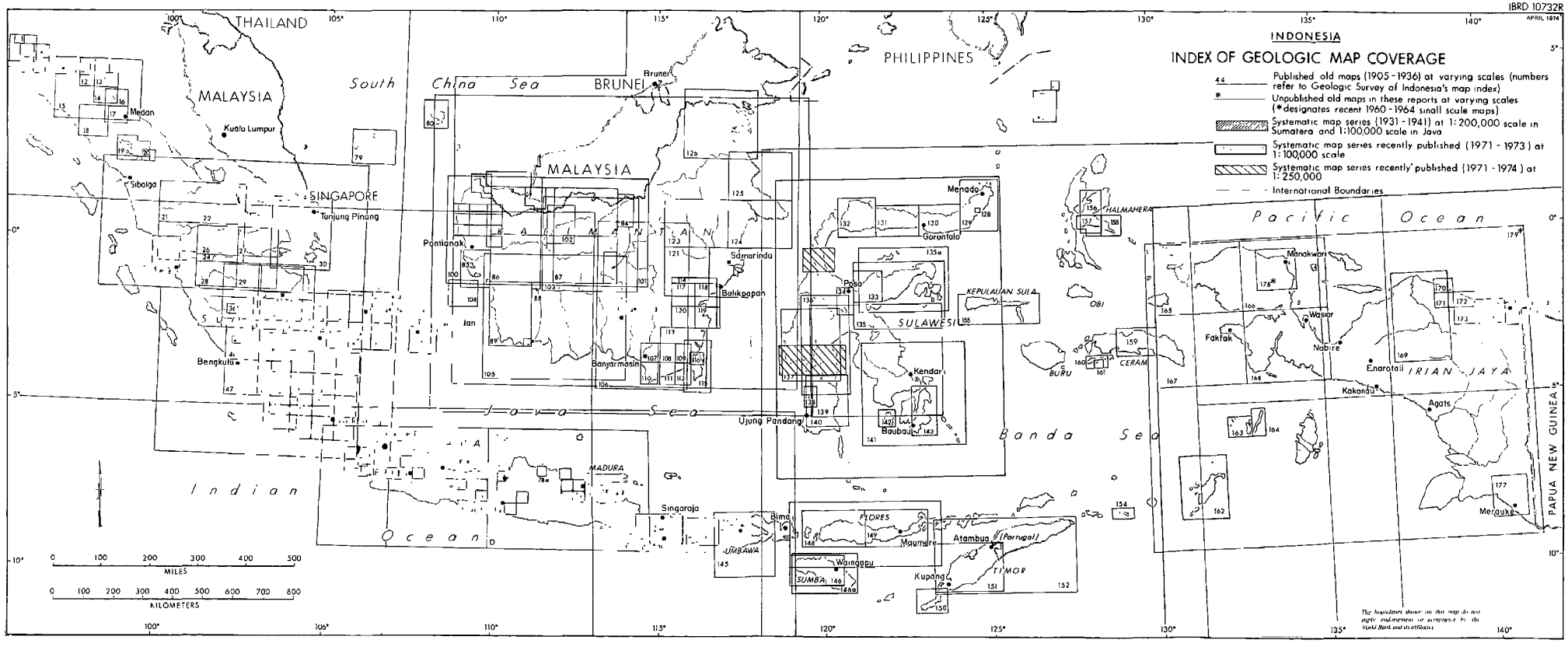

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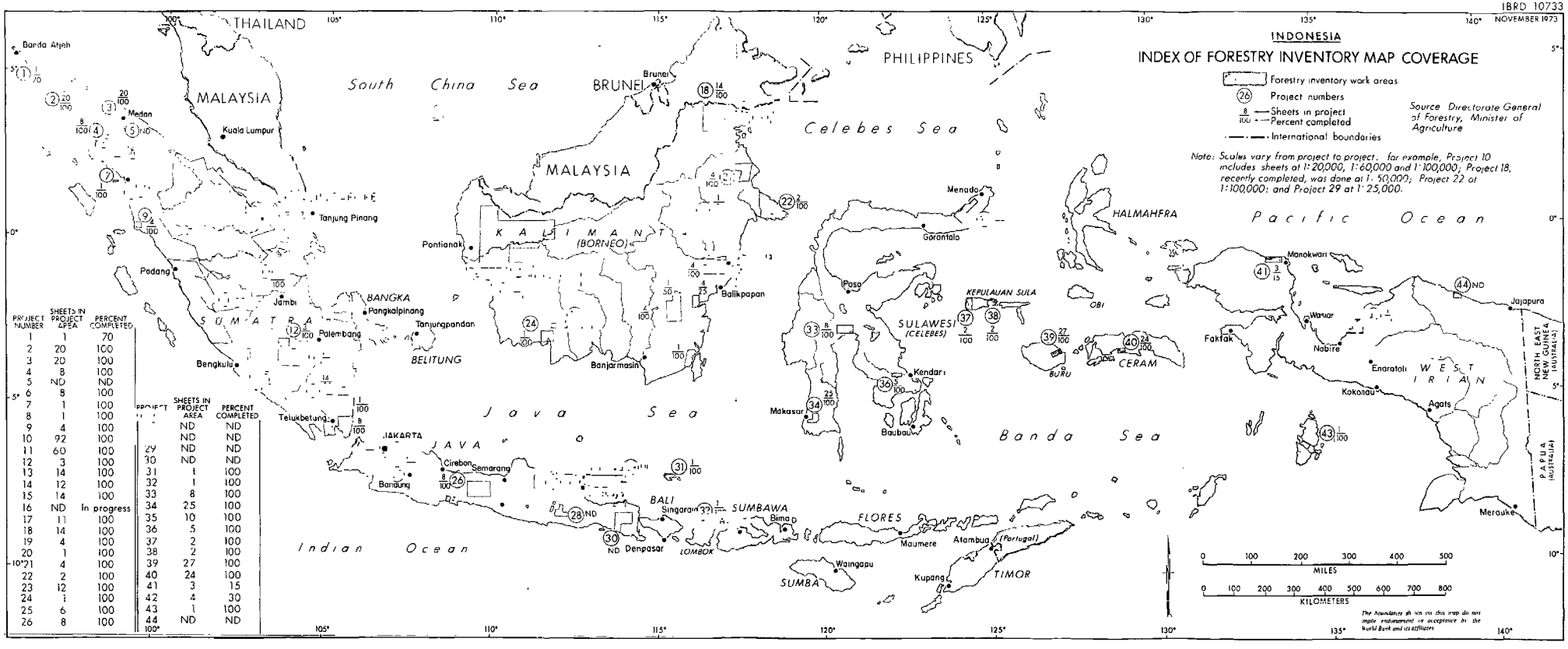

PROJECT NUMBER	SHEETS IN PROJECT AREA	PERCENT COMPLETED
1	1	70
2	20	100
3	20	100
4	8	100
5	ND	ND
6	8	100
7	1	100
8	1	100
9	4	100
10	92	100
11	60	100
12	3	100
13	14	100
14	12	100
15	14	100
16	ND	In progress
17	11	100
18	14	100
19	4	100
20	1	100
21	4	100
22	2	100
23	12	100
24	1	100
25	6	100
26	8	100
27	ND	ND
28	ND	ND
29	ND	ND
30	ND	ND
31	1	100
32	1	100
33	8	100
34	25	100
35	10	100
36	5	100
37	2	100
38	2	100
39	27	100
40	24	100
41	3	15
42	4	30
43	1	100
44	ND	ND

IBRD 10734
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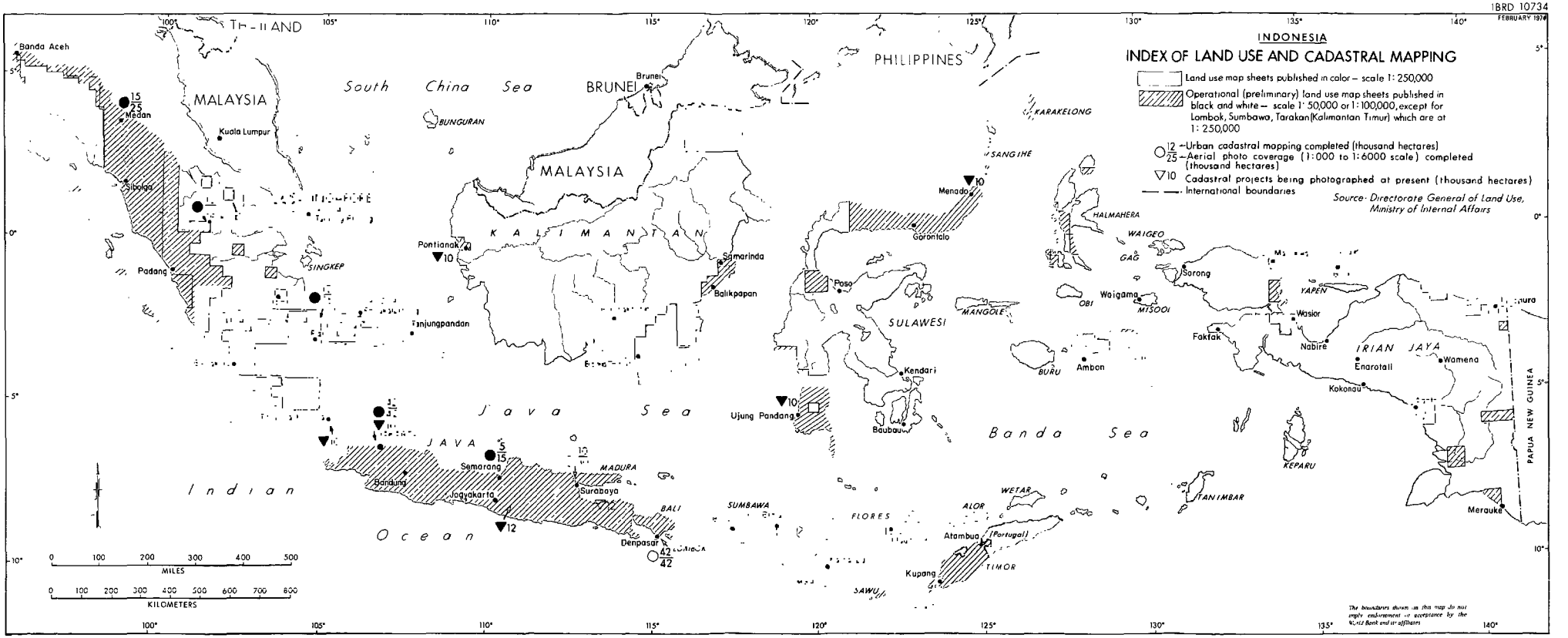

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18RD 11051

JULY 1974

INDONESIA

Index of Earth Resources and Technology Satellite (ERTS) Imagery

(Includes four bands of multi spectral sensed imagery)

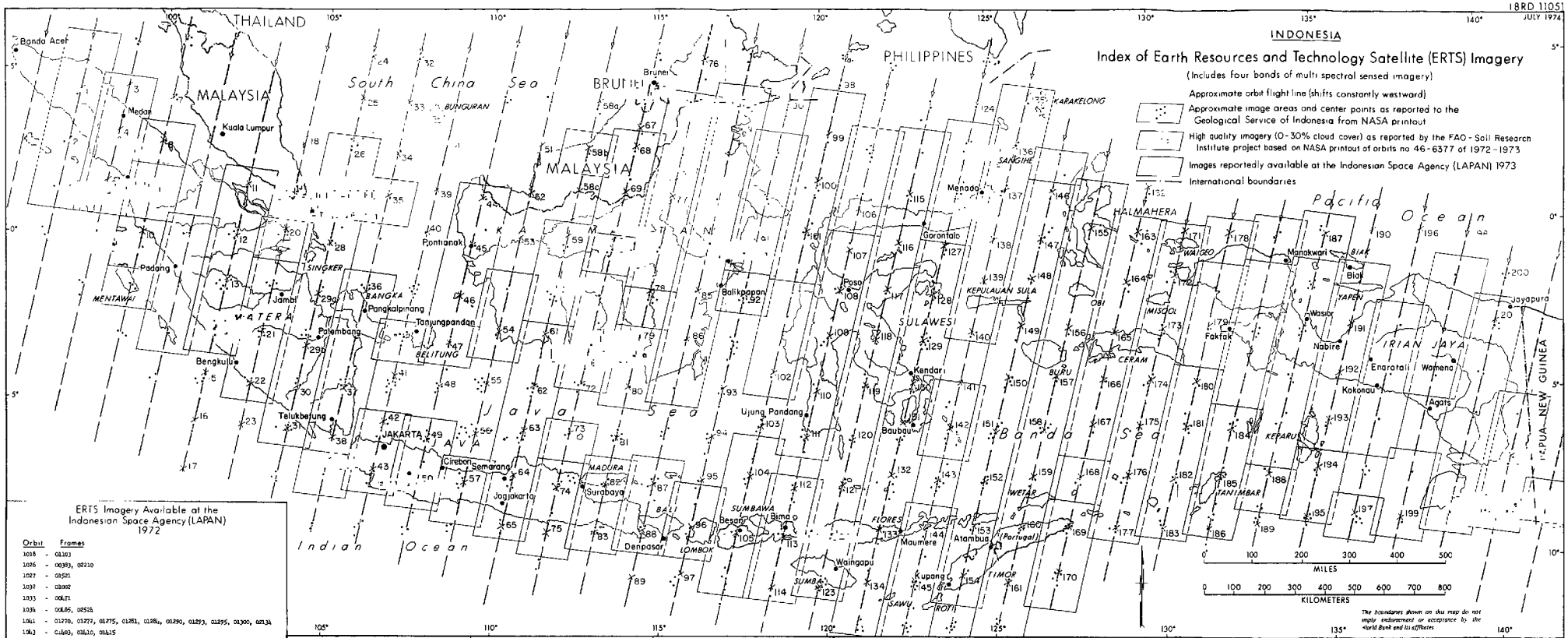
Approximate orbit flight line (shifts constantly westward)

Approximate image areas and center points as reported to the Geological Service of Indonesia from NASA printout

High quality imagery (0-30% cloud cover) as reported by the FAO - Soil Research Institute project based on NASA printout of orbits no 46-6377 of 1972-1973

Images reportedly available at the Indonesian Space Agency (LAPAN) 1973

International boundaries



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ERTS Imagery Available at the Indonesian Space Agency (LAPAN) 1972

Orbit	Frames
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1027	00521
1032	01002
1033	00671
1036	00686, 00524
1041	01270, 01272, 01275, 01281, 01284, 01290, 01293, 01295, 01300, 02134
1043	01403, 01410, 01415
1044	01424, 01432, 01434, 01441, 01445, 01461, 01464, 01470
1049	02134, 02141, 02152
1051	00610, 00631, 00640, 01284, 02210, 02212, 02215, 02251, 02260, 02263
1053	00512, 00514, 00521, 00529, 00535, 00541, 00544, 00550, 00553
1054	00573, 00575, 00582, 00591, 00593, 01000, 01003, 01005, 01011
1055	01025, 01031, 01034, 01040, 01043, 01045, 01052
1059	01284, 01290, 01293, 01295, 01302
1067	02160, 02161, 02145, 02152
1068	02190, 02192
1070	00683, 00685, 00690, 00692, 00694, 02312, 02314, 02321
1071	00553, 01181
1072	00584, 01011, 01014
1073	01040, 01043, 01045, 01052, 01078
1075	01154, 01160, 01163, 01165, 01172, 01174, 01181, 01183
1076	01361
1081	01521, 01524
1084	00061
1085	00322, 00325, 00154
1086	00221, 00251, 00253
1088	00483
1092	01095, 01101, 01104, 01105, 01113, 01115, 01122, 01124, 01131, 01133
1094	01050
1096	01322, 01325, 01331, 01334, 01340, 01343, 01350, 01352, 01354, 01360
1097	01372, 01390, 01392, 01395, 01401, 01406, 01413
1207	01512
1246	02083

Index No.	Identification No	Orbit No.	Cloud Cover %
1	1114 - 03153	1581	20
2	1168 - 03154	2334	30
3	1401 - 03084	5583	20
4	1437 - 03081	6085	10
5	1401 - 03093	5583	30
6	1401 - 03096	5583	30
7	1058 - 03032	800	30
8	1418 - 03030	5820	30
9	1418 - 03032	5820	30
10	1418 03035	5820	20
11	1074 - 02524	1023	10
12	1326 - 02534	4537	00
13	1326 - 02540	4537	20
14	1326 02543	4537	20
15	1434 - 02531	6043	20
16	1074 02545	1023	30
17	1074 02561	1023	10
18	1451 02445	6280	20
19	1451 02451	6280	20
20	1451 02454	6280	20
21	1325 02484	4523	30
22	1325 02491	4523	10
23	1325 02493	4523	20
24	1108 02404	1497	20
25	1108 - 02410	1497	10
26	1108 - 02413	1497	30
27	1108 02415	1497	30
28	1324 02421	4509	10
29 a	1324 - 02424	4509	30
29 b	1324 - 02430	4509	30
30	1324 - 02433	4509	10
31	1108 - 02440	1497	20
32	1107 - 02345	1483	20
33	1449 - 02330	6252	10
34	1107 - 02354	1483	20
35	1107 - 02361	1483	10
36	1323 - 02365	4495	30
37	1323 - 02374	4495	30
38	1105 - 02252	1455	30
39	1412 - 02290	5736	20
40	1412 - 02293	5736	10
41	1070 - 02312	967	10
42	1070 - 02314	967	20
43	1070 - 02321	967	10
44	1051 - 02240	702	20
45	1051 - 02242	702	10
46	1051 - 02245	702	10
47	1051 - 02251	702	10
48	1393 - 02252	5471	20
49	1105 - 02264	1455	10
50	1051 02263	702	20
51	1446 02162	6210	10
52	1446 02164	6210	10
53	1356 02185	4955	00
54	1410 02185	5708	20
55	1068 02195	939	10
56	1068 - 02201	939	10
57	1068 - 02204	939	10
58 a	1103 02122	1427	20
58 b	1049 02120	674	30
58 c	1355 02124	4941	10
59	1355 02131	4941	20
60	1355 02133	4941	30
61	1049 02134	674	10
62	1049 02141	674	10
63	1049 02143	674	20
64	1067 02145	925	00
65	1067 02152	925	00
66	1084 02060	1162	30
67	1084 02063	1162	30
68	1372 - 02062	5178	20
69	1246 - 02075	3421	30
70	1444 - 02054	6182	10
71	1372 - 02080	5178	30
72	1444 - 02070	6182	10
73	1156 02083	2166	10
74	1066 - 02091	911	00
75	1444 02081	6182	10
76	1173 - 02001	2403	10
77	1443 01594	6168	30
78	1443 - 02003	6168	10
79	1443 - 02005	6168	10
80	1143 02012	6168	10
81	1102 - 02093	1413	10
82	1083 02034	1148	20
83	1065 02035	897	30
84	1442 - 01542	5154	30
85	1442 - 01544	5154	20
86	1442 - 05154	5154	20
87	1100 - 01582	1388	10
88	1100 - 01585	1388	10
89	1118 - 01592	1636	10
90	1153 01493	2124	30
91	1369 01500	5136	30
92	1441 01480	6140	20
93	1135 - 01520	1873	30
94	1441 - 01502	6140	10
95	1441 - 01504	6140	10
96	1297 - 01532	4132	10
97	1387 - 01524	5387	20
98	1044 - 01425	604	30
99	1044 - 01432	604	20
100	1044 - 01434	604	20
101	1044 - 01441	604	30
102	1044 - 01452	604	10
103	1044 - 01455	604	10
104	1116 - 01470	1608	10
105	1044 01464	604	10
106	1187 01384	2598	20
107	1097 01390	1343	20
108	1097 01392	1343	10
109	1097 01395	1343	10
110	1151 - 01403	2096	10
111	1151 - 01406	2096	10
112	1097 - 01410	1343	10
113	1097 - 01413	1343	10
114	1097 - 01415	1343	10
115	1096 - 01325	1329	20
116	1096 - 01331	1329	10
117	1438 - 01315	6098	30
118	1438 - 01322	6098	20
119	1438 - 01324	6098	30
120	1384 - 01342	5345	20
121	1096- 01352	1329	10
122	1096 - 01354	1329	00
123	1096 - 01361	1329	10
124	1113 - 01263	1566	30
125	1023 - 01260	311	20
126	-1113 - 01272	1566	20
127	1113 01275	1566	30
128	1041 01272	562	20
129	1149 - 01284	2068	30
130	1041 - 01281	562	20
131	1069 - 01284	813	20
132	1023 - 01290	311	30
133	1419 - 01284	5833	30
134	1149 - 01304	2068	30
135	1418 - 01192	5819	30
136	1004 01205	46	30
137	1004 - 01211	46	10
138	1454 - 01193	6321	20
139	1004 - 01220	46	20
140	1004 - 01223	46	20
141	1004 - 01225	46	30
142	1418 - 01221	5819	20
143	1418 01224	5819	10
144	1464 - 01220	6321	10
145	1382 - 01240	5317	10
146	1147 - 01155	2040	30
147	1147 - 01162	2040	30
148	1075 - 01160	1036	30
149	1075 - 01163	1036	20
150	1075 - 01165	1036	20
151	1463 - 01153	6307	20
152	1436 - 01163	6056	30
153	1436 - 01165	6056	30
154	1381 01182	5303	30
155	1462 - 01081	6293	30
156	1462 - 01090	6293	30
157	1092 01113	1273	20
158	1092 01115	1273	20
159	1092 01122	1273	20
160	1148 01131	2026	10
161	1148 01133	2026	10
162	1109 - 01042	1510	10
163	1073 01040	1008	20
164	1073 01043	1008	20
165	1073 - 01045	1008	10
166	1073 01052	1008	10
167	1109 01062	1510	20
168	1451 01043	6279	10
169	1451 01045	6279	10
170	1379 01065	5275	10
171	1064 00582	743	30
172	1072 00584	994	30
173	1072 00591	994	10
174	1054 - 00593	743	20
175	1054 - 01000	743	20
176	1064 - 01002	743	10
177	1396 - 01003	5612	20
178	1053 - 00523	729	30
179	1053 - 00532	729	20
180	1053 - 00535	729	20
181	1053 - 00541	729	10
182	1071 - 00644	980	10
183	1053 - 00550	729	00
184	1034 - 00483	464	10
185	1034 - 00485	464	10
186	1034 - 00492	464	00
187	1051 - 00410	701	20
188	1393 - 00425	5470	20
189	1051 - 00433	701	20
190	1392 - 00351	5456	20
191	1122 - 00370	1691	30
192	1122 - 00372	1691	30
193	1122 - 00375	1691	20
194	1122 - 00380	1691	20
195	1122 00384	1691	20
196	1085 - 00295	1175	30
197	1085 00322	1175	20
198	1048 - 00235	859	30
199	1030 - 00262	408	00
200	1443 00171	6167	10
201	1443 - 00174	6167	30
202	1029 - 00204	394	10
203	1028 - 00143	380	30
204	1028 - 00145	380	00

B. STATISTICAL APPENDIX

Table A.1: STANDARD NORMAL RAINFALL (AVERAGE 1931-1969)
(mm)

Name of Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Jakarta	334	241	201	141	113	97	61	52	78	91	155	196	1,760
Bandung	254	251	255	239	153	86	103	97	81	133	262	245	2,159
Semarang	276	271	216	193	147	79	87	77	84	148	220	235	2,033
Jogjakarta	294	319	279	117	156	69	123	77	29	69	183	287	2,002
Surabajat	278	239	213	131	110	55	39	24	12	46	139	232	1,518
Kutaraja	168	101	101	116	147	93	84	109	137	195	202	170	1,623
Medan	184	68	91	162	182	140	146	176	237	288	201	178	2,053
Pakanbaru	215	191	250	254	194	113	144	169	186	275	301	284	2,576
Padang	361	252	355	409	340	289	250	350	459	573	581	545	4,764
Jambi	286	224	312	305	285	187	147	198	180	306	357	312	3,099
Palembang	254	229	287	242	177	130	98	120	110	174	276	284	2,381
Pontianak	272	198	207	252	281	238	179	176	255	332	345	321	3,056
Muaratewe	300	306	381	389	304	228	178	209	168	244	380	452	3,539
Banjarmasin	333	362	317	257	257	162	148	104	116	142	222	335	2,755
Smarinda	169	167	187	237	183	170	163	122	134	146	197	213	2,088
Menado	393	400	247	393	254	256	246	170	204	218	294	337	3,352
Ujung Pandang	572	563	370	177	242	87	68	49	35	127	276	614	3,188
Denpasar	353	239	201	120	146	130	145	84	58	146	240	288	2,149
Ampenan	275	197	131	97	120	88	68	38	34	63	143	178	1,432
Kuparg	341	395	169	83	21	22	24	2	3	43	110	243	1,456
Ambon	129	126	135	168	446	517	679	501	398	154	72	134	3,499

Source: Meteorological and Geophysical Service, Dept. of Air Communication.

Table A.2: LEGEND FOR SOIL MAP OF INDONESIA

Legend No.	FAO World Soil Resources Report No. 33 Soil Classification	USDA Soil Classification Equivalent
1	(5. Lithosols and Rendzinas	Lithosols
	(12. Lithosols, Ferralsols and Red-Yellow Podzolic Soils	Lithosols and Orthic Ferralsols
2	(56. Andosols (Humid)	Ochric Andosols
	(59. Andosols and Ferrasols	Ochric Andosols
3	(16. Red-Brown Mediterranean Soils and Lithosols	Orthic Luvisols
	(18. Red-Yellow Podzolic Soils and Lithosols	Orthic Acrisols
	(40. Red-Brown Mediterranean Soils	Chromic Luvisols
	(61. Red-Yellow Podzolic Soils	Orthic Acrisols
	(62. Red-Yellow Ferralsols and Red-Yellow Podzolic Soils	Orthic Ferralsols
	(63. Ferruginous Tropical Soils	Ferric Luvisols/Ferric Acrisols
	(66. Dark Red Ferralsols	Rhodic Ferralsols
4	(73. Regosols (Coastal Sands)	Eutric Regosols
	(74. Regosols (Volcanic Ash)	Eutric Regosols
	(75. Regosols and Vertisols	Eutric Regosols
	(76. Regosols and Rendzinas	Eutric Regosols
5	(55. Vertisols	Pellic Vertisols
	(69. Low Humic Gley Soils and Grey Hydromorphic Soils	Mollic Gleysols or Plinthic Gleysols or Gleyic Acrisols
6	(77. Alluvial Soils and Low Humic Gley Soils	Eutric Fluvisols
	(78. Alluvial Soils and Saline Soils	Eutric Fluvisols
	(79. Acid Sulphate Soils	Thionic Fluvisols
7	(27. Organic Soils	Histosols
	(31. Podzols and Organic Soils	Orthic Podzols

Source: Soil Map of South East Asia, First Draft March 1964, by FAO/UNESCO Soil Map of the World Project.

Table A.3: TOTAL AREA OF GREAT SOIL GROUPS AND ITS DISTRIBUTION (x 1.000 ha)

	Java	Sumatra	Borneo	Celebes	Lesser Sunda Island	Maluku	Irian Jaya	Total
I. Plain Lowland								
1. Organosol/Hydromorphic Alluvials	-	14.250	6.820	-	-	-	6.657	27.727
2. Alluvials	2.039	2.442	4.270	761	243	313	6.758	16.832
3. Regosol	-	-	-	21	-	-	-	21
4. Rendzina	-	-	-	31	156	437	186	811
5. Grumusol	312	-	-	219	97	13	-	641
6. Meditteranian	26	-	-	769	-	210	-	1.005
7. Latosol	271	531	-	-	-	-	-	802
8. Podsolic	371	9.612	10.935	1.356	156	253	5.117	27.800
9. Podsol	-	812	2.513	-	-	-	-	3.325
Total	3.019	27.648	24.544	3.157	653	1.226	18.718	78.965
II. Rolling to Undulating								
1. Regosol	2.575	-	169	21	400	156	-	3.321
2. Grumusol	400	-	-	-	-	-	-	400
3. Meditteranian	2.123	-	-	831	3.031	283	172	6.361
4. Latosol	2.540	3.218	1.576	830	-	-	21	8.186
5. Podsolic	-	11.000	5.201	640	-	2.030	4.508	23.349
Total	7.638	14.218	6.946	2.322	3.431	2.369	4.701	41.617
III. Hilly/Mountainous								
1. Latosol	109	469	.907	2.088	382	800	3.426	8.181
2. Andosol	950	2.000	1.500	91	172	-	16	4.729
3. Podsol	-	484	1.660	-	-	-	-	2.144
4. Complex	1.500	2.540	18.232	11.145	2.722	3.981	14.576	54.696
Total	2.559	5.494	22.299	13.324	3.276	4.7[illegible]	18.018	69.751
GRAND TOTAL	13.217	47.360	53.789	18.803	7.360	8.367	41.437	190.335

Source: [illegible] 197[illegible], Tables 3, 4, 5 and 6

Table A.4: DISTRIBUTION OF GREAT SOIL GROUPS (x1.000 ha) x/

G.S.G.	Plain lowland 0-8%	Rolling to Undulating 8-15%	Hilly to Mountainous 15%	Total
1. Podsolic (Ultisol)	27.800	23.349	-	51.149
2. Organosol/Hidromorphic Alluvials (Histosol/Entisol)	27.727	-	-	27.727
3. Latosol (Oxisol/Inceptisol)	802	8.186	8.181	17.170
4. Alluvials (Entisol/ Inceptisol)	16.832	-	-	16.832
5. Mediteranian (Alfisol)	1.005	6.361	-	7.366
6. Andosol (Inceptisol)	-	-	4.729	4.729
7. Podsol (Spodosol)	3.325	-	2.144	5.470
8. Regosol (Inceptisol/Entisol)	21	3.321	-	3.342
9. Grumusol (Vertisol)	641	400	-	1.041
10. Rendzine (Mollisol/Rendol)	811	-	-	811
11. Complex	-	-	54.696	54.696
Total:	78.965	41.617	69.751	190.335

x/ Source: Generalized Soil map of Indonesia, 1964

Table A.5: SOIL SURVEYS

Period	Region	Scale	Acreage (Ha)	Purpose
A. 1950-1960				
1. Java & Madura			13.217400	
	(1) Java & Madura	1:1.000.000	13.217400	Agric. development
	(2) do	1: 250.000	13.217400	Intensification Programs
2. Sumatera			41.821.400	
	(1) Eastern part of North Sumatra	1:1.000.000	2.206.000	Agric. development
	(2) Tapanuli	1:1.000.000	4.872.700	do
	(3) Riau	1:1.000.000	9.456.200	do
	(4) West Sumatera	1:1.000.000	4.977.800	do
	(5) Jambi	1:1.000.000	4.492.400	do
	(6) Southern part of Sumatera	1:1.000.000	15.816.300	do
3. Kalimantan			53.946.000	
	(1) West Kalimantan	1:1.000.000	14.676.000 */	Agric. development
	(2) South Kalimantan	1:1.000.000	3.766.000 */	do
	(3) Central Kalimantan	1:1.000.000	15.260.000 */	do
	(4) East Kalimantan	1:1.000.000	20.241.000 */	do
4. Sulawesi	)			
5. Bali	)			
6. Nusa Tenggara	)	Small localized areas for specific purposes		
7. Maluku	)			
8. Irian Jaya	)			

*/ The Central part of the island is not covered.

Table A. 5 (continued)

Period	Region	Scale	Acreage (Ha)	Purpose
B. 1960-1966				
1. Java & Madura				
	(1) West Java	1: 250.000	1.250.000	Intensification Programme
	(2) Cimanuk Watershed (Central part)	1: 250.000	179.000	Rehaibilitation of critical areas
	(3) Bogor	1: 50.000	66.000	Intensification Programme
	(4) Bogor-Jakarta	1: 5.000	5.600	Systematic mapping
	(5) Central Java	1: 250.000	1.600.000	Intensification Programme
	(6) Tegal	1: 50.000	29.250	Intensification Programme
	(7) Pati	1: 50.000	34.000	Intensification Programme
	(8) East Java	1: 250.000	1.950.000	do
	(9) Asembagus	1: 50.000	23.000	do
	(10) Bodjonegoro	1: 50.000	35.000	do
2. Sumatera				
	(1) Rawa Sragi	1: 100.000	280.000	Agric. development
	(2) Menggala	1: 250.000	100.000	Rosella Estate
	(3) Aji Pemanggilan	1: 50.000	10.000	Sugarcane Estate
	(4) Buluraji	1: 100.000	8.000	Agric. development
	(5) Way Seputih	1: 25.000	2.000	do
	(6) Way Tuba	1: 25.000	800	Pasture development
3. Kalimantan				
	(1) Central Kalimantan	1: 1.000.000	8.614.000	Agric. development
4. Sulawesi				
	(1) Malili	1: 100.000	67.500	Agric. development
	(2) Bone	1: 10.000	9.400	Sugarcane Estate
5. Nusa Tenggara				
	(1) Sumbawa	1: 500.000	1.449.000	Agric. development

Note: Some small areas in Java and West Irian for specific purposes

Table A.6: AREAS SURVEYED AND MAPPED IN THE FOLLOWING PERIODS:

a) 1966/1967 until 1968/1969, b) 1969/1970 until 1971/1972

Period	Location	Scale	Average	Programme	Purpose
a) 1966 to 1967 until 1968 to 1969	1966 1. Petjangaan (Centre Java)	1:250.000	240.000 ha	Department of Agriculture	Relationalized land use
	2. G. Purwodadi (East Java)	1: 25.000	3.600 ha	Department of Agriculture /Directorate General of Estate Crops/Sugar Estate	Relationalized land use
	1967 1. Lombok Island	1:250.000	450.000 ha	Soil Research Institute/ Direcorate General of Agriculture	Rehabilitation of critical region (famine problem) and regional development
	2. South Celebes	1:500.000	5.462.000 ha	Soil Research Institute/ Directorate General of Agriculture	Agricultural/regional development
	3. Sukamandi (West Java)	1: 50.000	5.000 ha	Soild Research Institute/ Directorate General of Agriculture	Intensification programme for the development of Sukamandi area
	1968 1. Lampung	1:250.000	3.000.000 ha	Soil Research Institute/ Directorate General of Agriculture	Agricultural development/ regional development
	2. K.G. Kadhipaten (West Java)	1: 25.000	6.500 ha	Department of Agriculture/Directorate General of Estate crops	Rationalized land use
	3. Kendari (South East Celebes)	1:100.000	7.500 ha	Department of transmigration	Transmigration/resettlement
	4. Kapuas Delta I (West Kalimantan)	1:200.000	100.000 ha	Provincial government	Resettlement programme

Table A.6 (continued)

Period		Location	Scale	Average	Programme	Purpose
b) 1969/1970 until 1971/1972	1969	1. Buru Island I	1: 25.000	2.300 ha	Attorney-General	Resettlement
		2. Kapuas Delta II, West Kalimantan	1:200.000	233.600 ha	Provincial government	
		3. Lubuklinggau (South Sumatera)	1: 50.000	35.000 ha	Ministry of Public Work and Electricity	Irrigation
		4. North Sumatera	1:250.000	2.206.000 ha	Soil Research Institute/ Directorate General of Agriculture	Agricultural/Regional development
		5. South Sumatera I	1:250.000	1.918.000 ha	Soil Research Institute/ Directorate General of Agriculture	Agricultural/Regional development
		6. Wonogiri	1:250.000	33.500 ha	Soil Research Institute Directorate General of Agriculture	Regional rehabilitation
		7. PG. Olean, East Java	1: 25.000	3.900 ha	Department of Agriculture	Rationalized land use
		8. Buru Island II	1:100.000	16.400 ha	Attorney-General	Resettlement
	1970	1. PG Trangkil	1: 25.000	9.000 ha	Directorate General of Estate crops/Sugar estate	Rationalized land use
		2. Siberut Island	1:250.000	35.700 ha	Ministry of Defense and Security	Resettlement
		3. South Sumatera II	1:250.000	4.500.000 ha	Soil Research Institute/ Directorate General of Agriculture	Agricultural/Regional development

Table A.6 (continued)

Period	Location	Scale	Average	Programme	Purpose
	4. Demak (Djratunseluna)	1: 50.000	45.000 ha	Ministry of Public Work and Electricity/ consultant	Rehabilitation
	5. Maros	1: 25.000	5.000 ha	Directorate General of Agriculture	Tani Makmur/ Intensification programme
1971	1. Wamena (Irian Jaya)	1:250.000	15.000 ha	Directorate General of Agriculture	Regional development
	2. Buru island III	1:100.000	10.000 ha	Ministry of Defense and Security	Resettlement
	3. Garut	1: 50.000	2.000 ha	Directorate General of Agriculture	Tani Makmur/ Intensification programme
	4. Watershed area of	1:100.000	200.000 ha	Soil Research Institute /Directorate General of Agriculture	Agricultural development
	5. Muara Siak and Rengat	1: 50.000	30.000 ha	Provincial government/ Agricultural Extension-Service	Agricultural development
	6. Djelapat area, P.Petak South Kalimantan	1: 50.000	16.000 ha	P4S, Ministry of Public Work & Electricity	Pilot project of P4S

Table A7: ESTIMATED AREA OF FOREST/1 BY GEOGRAPHICAL LOCATION AND ECOLOGICAL TYPE

(millions of hectares)

REGION	Total Land Area	Primary Rain Forest 3/	Mixed Deciduous Forest	Secondary Forest 4/	Mangrove Coastal & Swamp Forest 3/	Teak Forest 5/	Non-Teak Plantations 6/	Total Forested Area	Percent Forested
Kalimantan	54	25.7	-	9.2	6.1	-	-	41	76
Sumatera	47	15.5	-	5.6	6.9	-	-	28	60
Sulawesi	19	6.8	-	3.2	-	-	-	10	53
Java & Madura	13	0.3	1.5	-	0.1	0.8	0.3	3	23
Maluku	8	4.9	-	1.0	0.1	-	-	6	75
Nusa Tenggara	7	1.4	-	0.6	-	-	-	2	29
Irian Jaya	42	25.5	-	-	4.5	-	-	30	71
TOTAL	190 /2	80.1	1.5	19.6	17.7	0.8	0.3	120	63

1/ "Forest" as defined in law #5 of 1967 is any "area covered with growing trees which as a whole forms a natural biological living community with its surrounding".

2/ In the "Statistical Pocketbook of Indonesia", April 1971, the total land area according to the Directorate of Topography is 201.9 million hectares, but according to the Directorate General of Forestry the figure is 190.4 million hectares.

3/ These categories will include areas which were once forests but are now open grassland, cultivated or in some other way converted.

4/ These develop after the original forest has been destroyed by fire or shifting cultivation. Areas indicated are very rough estimates based on data contained in "Forestry Resources in Indonesia" Department of Forestry, May, 1966 and Dr. J. A. Von Monroy's "Forestry and Forest Industries in the First and S-cond Five-year Plans of Indonesia", October, 1968.

5/ Comprises plantations and natural stands.

6/ Includes coniferous and hardwood plantations

Source: Several official documents and reports which due to purpose and time of publication do not agree in all respects. Main sources are the "Forestry Masterplan Summary, D.G.F., December 1971, and the documents noted in footnote /4.

Table A.8: ESTIMATES OF REGIONAL FERTILITY AND MORTALITY DIFFERENTIALS IN INDONESIA (1961)

Region	Crude Birth Rate	Crude Death Rate	Rate of Natural Increase	Gross Reproduction Rate	General Fertility Rate
West Java	49.8	22.5	27.3	3.459	.2130
Central Java	46.8	22.3	24.5	3.161	.2076
Jogjakarta	39.9	22.3	17.6	2.508	.1681
East Java	42.7	22.2	20.5	2.771	.1830
Java	46.1	22.3	23.8	3.059	.2009
Sumatera	51.6	22.6	29.0	-	.2240
Kalimantan	48.2	22.4	25.8	-	.2089
Sulawesi	49.5	22.5	27.0	-	.2185
Other Islands	49.6	22.5	27.1	-	.2213
Outer Provinces	50.2	22.6	27.6	-	.2176
Indonesia	47.6	22.4	25.2	3.1	.2073

Source: S. Iskandar, Some Monographic Studies on the Population in Indonesia; Jakarta: University of Indonesia, 1962.

Table A.9: LABOR FORCE AND POPULATION-10 YEARS OLD AND OVER, 1971
(in thousands)

	Number of Workers	Labor in Search of Employment	Total Labor Force	Total Population	Employment Rate (Col. 2 as Percent of Col. 3)	Labor Force as Percent of Population
DCI Jakarta	1,273	71	1,344	3,152	94.7	42.6
West Java	6,148	201	6,348	14,440	96.8	44.0
Urban	675	46	721	1,858	93.6	38.8
Rural	5,473	155	5,627	12,582	97.3	44.7
Central Java	8,177	1,345	8,312	15,053	98.4	55.2
Urban	753	36	789	1,741	95.5	45.3
Rural	7,424	989	7,523	13,312	98.7	56.5
D. I. Jogjakarta	1,018	18	1,036	1,801	98.2	57.5
Urban	124	5	129	310	95.9	41.7
Rural	894	13	907	1,491	98.6	60.8
East Java	9,142	180	9,321	17,868	98.1	52.2
Urban	1,158	46	1,203	2,719	96.2	44.3
Rural	7,984	134	8,118	15,149	98.4	53.6
Total Java & Madura	25,757	604	26,362	52,314	97.7	50.4
Urban	3,983	204	4,187	9,780	95.1	42.8
Rural	21,775	400	22,175	42,534	98.2	52.1
Sumatera	6,694	167	6,860	13,778	97.6	49.8
Urban	927	52	980	2,538	94.7	38.6
Rural	5,766	115	5,880	11,240	98.1	52.3
Kalimantan	1,654	26	1,680	3,455	98.5	48.6
Urban	316	5	321	754	98.6	42.6
Rural	1,338	21	1,359	2,701	98.4	50.3
Sulawesi	2,322	65	2,387	5,631	97.3	42.4
Urban	352	28	380	990	92.5	38.4
Rural	1,970	37	2,007	4,642	98.2	43.2

Table A.9 (continued)

	Number of Workers	Labor in Search of Employment	Total Labor Force	Total Population	Employment Rate (Col. 2 as Percent of col. 3)	Labor Force as Percent of Population
Other Islands	2,783	27	2,810	5,249	99.0	53.5
Urban	218	5	223	556	97.8	40.1
Rural	2,565	22	2,587	4,692	99.2	55.1
Indonesia	39,210	890	40,100	80,426	97.8	49.9
Urban	5,796	295	6,091	14,617	95.2	41.7
Rural	33,414	595	34,009	65,809	98.3	51.7

Source: 1971 Population Census - Biro Pusat Statistik.

Table A.10: REGIONAL DISTRIBUTION OF MANPOWER BY BRANCHES OF INDUSTRY

(Number : In thousand persons)
(Distribution: In Percent)

		Indonesia		Java & Madura		Sumatra		Kalimantan		Sulawesi		Other Islands	
		Number	Distribution	Number	Distribution	Number	Distribution	Number	Distribution	Number	Distribution	Number	Distribution
1.	Agriculture	24,946	62.2	15,229	57.8	4,900	71.4	1,212	72.2	1,504	63.0	2,100	74.7
2.	Mining and Quarrying	92	0.2	32	0.1	55	0.8	3	0.1	1	ng.	1	ng
3.	Manufacturing Industry	2,953	7.4	2,303	8.7	183	2.7	41	2.5	237	9.9	190	6.8
4.	Electricity	38	0.1	27	0.1	5	0.1	3	0.1	1	ng.	3	0.1
5.	Construction	750	1.9	522	2.0	110	1.6	25	1.5	37	1.6	56	2.0
6.	Wholesale and Retail Trade	4,152	10.4	3,309	12.6	460	6.7	95	5.7	159	6.7	129	4.6
7.	Transportation	932	2.3	651	2.5	133	1.9	46	2.7	81	3.4	21	0.7
8.	Finance	99	0.2	75	0.3	14	0.2	2	0.1	50	0.2	3	0.1
9.	Social, Communal and Individual Services	3,980	9.9	2,859	10.8	568	8.3	132	7.9	232	9.7	190	6.8
10.	Others	1,749	4.4	1,112	4.2	343	5.0	109	6.5	83	3.5	103	3.7
11.	New Labor	408	1.0	246	0.9	89	1.3	11	0.7	47	2.0	16	0.6
	Total	40,100	100.0	26,362	100.0	6,860	100.0	1,680	100.0	2,387	100.0	2,810	100.0

Source: Appendix Table 11.

Table A.11: EMPLOYMENT AND LABOR FORCE IN INDONESIA, 1971
(Figures in thousand)

	Total Indonesia:						Labor Force In 1/:											
	Working Labor Force			Total Labor Force			Total Labor Force		Java and Madura			D.C.I. Djakarta	West Java			Central Java		
	Male	Female	Total	Male	Female	Total	Rural	Urban	Rural	Urban	Total	Urban	Rural	Urban	Total	Rural	Urban	Total
1. Agriculture, Hunting Forestry and Fishery	16,876	7,896	24,772	17,001	7,945	24,946	24,340	606	14,984	245	15,229	44	3,568	44	3,612	4,721	41	4,762
2. Mining and Quarrying	84	6	90	86	6	92	47	46	25	7	32	4	3	ng.	3	2	2	4
3. Manufacturing Industry	1,515	1,416	2,932	1,530	1,423	2,953	2,279	674	1,787	515	2,302	121	334	84	418	925	151	1,076
4. Electricity, Gas and Water	36	2	38	36	2	38	11	27	7	20	27	8	3	4	7	3	3	6
5. Construction	727	10	737	740	10	750	452	298	307	215	522	92	134	33	167	85	31	116
6. Wholesale and Retail Trade, Restaurants and Hotels	2,331	1,782	4,113	2,353	1,799	4,152	2,681	1,471	2,253	1,056	3,309	321	594	164	758	931	217	1,148
7. Transportation, Storage and Communication	898	18	916	914	18	932	408	524	279	372	651	139	127	65	192	94	54	149
8. Finance, Insurance and Real Estate	79	16	95	81	18	99	10	89	6	69	75	37	1	7	8	2	11	13
9. Social, Communal and Individual Services	2,863	1,060	3,923	2,904	1,076	3,980	2,098	1,882	1,476	1,383	461	399	399	243	641	535	234	769
10. Other	733	820	1,593	886	863	1,749	1,452	297	931	181	1,112	78	422	44	466	191	23	213
11. New Labor Force in Search of Employment	-	-	-	300	108	408	231	177	121	125	246	41	44	33	80	34	23	57
Total	26,184	13,026	39,210	26,832	13,268	40,100	34,009	6,091	22,175	4,187	26,362	1,344	5,627	721	6,349	7,523	789	8,312

Table A.11: (continued)

	LABOR FORCE IN:																	
	D.I. Jogjakarta			East Java			Sumatera			Kalimantan			Sulawesi			Other Islands		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
1. Agriculture, Hunting Forestry and Fishery	570	8	578	6,125	108	6,233	4,741	159	4,900	1,116	96	1,212	1,437	68	1,504	2,062	38	2,100
2. Mining and Quarrying	ng.	ng.	ng.	20	1	21	20	35	55	1	2	3	1	ng.	1	-	1	1
3. Manufacturing Industry	142	18	160	386	142	528	115	68	183	21	20	41	187	50	237	169	21	190
4. Electricity, Gas and Water	ng.	ng.	ng.	1	5	6	1	4	5	1	2	3	1	ng.	1	2	1	3
5. Construction	14	4	18	74	54	129	71	40	110	16	9	25	15	23	37	43	12	56
6. Wholesale and Retail Trade, Restaurants and Hotels	95	37	132	633	318	950	207	254	460	39	56	95	92	67	159	90	39	129
7. Transportation, Storage and Communication	6	8	14	51	106	157	61	72	133	12	35	46	43	35	81	12	10	21
8. Finance, Insurance and Real Estate	1	1	2	4	13	16	2	12	14	ng.	2	2	-	5	5	2	1	3
9. Social, Communal and Individual Services	54	47	101	489	399	888	315	253	568	56	76	132	139	92	232	112	78	190
10. Other	18	3	21	299	32	332	286	57	343	88	21	109	65	17	83	82	21	103
11. New Labor Force in Search of Employment	7	3	10	36	25	61	62	26	89	10	1	11	25	22	47	13	3	16
Total	907	129	1,036	8,118	1,203	9,321	5,880	980	6,860	1,359	321	1,680	2,007	380	2,387	2,587	223	2,810

1/ Due to rounding, figures may not add up.

Source: 1971 Census of Population - Biro Pusat Statistik

Table A.12: PERCENTAGE DISTRIBUTION OF TOTAL EMPLOYMENT CHANGE BY MAJOR ECONOMIC SECTOR AND REGION INDONESIA, 1961-1971

	Java and Madura	Sumatera	Kalimantan	Sulawesi	Other Islands	Indonesia
			per cent			
Agriculture, etc.	8.1	9.2	(-1.7)	(-1.1)	4.9	19.3
Mining and manufacturing	12.7	0.4	(-0.2)	2.1	1.5	16.5
Construction	1.2	0.4	0.1	0.2	0.4	2.4
Transport, communication and utilities	2.1	0.1	0.3	0.6	0.1	3.3
Trade and finance	25.9	2.7	0.2	1.2	1.0	31.0
Services	7.0	3.0	0.4	1.0	1.4	12.7
Other and unknown	9.1	3.3	1.1	0.5	0.8	14.7
Total	66.2	19.1	0.2	4.5	10.1	100.0

Source: 1961 Census and preliminary sample results from the 1971 Census.

Table A.13: EMPLOYMENT GROWTH RATES JAVA AND MADURA SELECTED SECTORS, 1961-1971

	URBAN	RURAL	TOTAL
		-per cent-	
Agriculture, etc.	-0.2	0.4	0.4
Manufacturing	-1.0	7.0	4.6
Transport	1.7	3.9	2.6
Services	2.7	1.5	2.0

Source: 1961 Census and preliminary sample results of the 1971 Census.

Table A.14: EMPLOYMENT IN LARGE AND MEDIUM-SCALE MANUFACTURING INDUSTRIES 1970 & 1972 BY MAJOR REGIONS

					1972			
	Estab.	% Share	No. of Persons Employed '000	% Share	No. of Estab.	% Share	No. of Persons Employed '000	% Share
I. Java & Madura, of which	13879	77.5	730.34	86.0	18571	74.3	697.53	80.7
1. Jakarta	1549	8.6	53.79	6.3	1879	7.5	63.24	7.3
2. West Java	2504	14.0	185.52	21.9	4976	19.9	182.21	21.1
3. Central Java	5376	30.0	220.83	26.0	5705	22.8	198.76	23.0
4. East Java	4450	24.9	270.19	31.8	6011	24.1	253.32	29.0
II. Sumatera	1972	11.0	80.56	9.5	3805	15.2	102.11	11.8
III. Kalimantan	461	2.6	11.83	1.4	815	3.3	20.13	2.3
IV. Sulawesi	1283	7.2	15.12	1.8	1228	4.9	18.41	2.1
V. Other Islands	305	1.7	11.10	1.3	573	2.3	26.51	3.1
Total	17900	100.0	848.95	100.0	24992	100.0	864.69	100.0

Source: Survey of Manufacturing Industries, 1970-1972, Biro Pusat Statistik.

Table A.15: MANUFACTURING INDUSTRIES IN INDONESIA, 1970

	Number of Establishments			Number of Power Equipments			Total Capacity (hp.)			Number of Persons Employed		
	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total
1. D. I. Aceh, of which:	10	85	95	75	132	207	4,565	3,836	8,400	4,317	1,063	5,380
- Palm Oil	3	1	4	14	1	15	464	120	584	3,433	24	3,457
- Rice Milling	1	24	25	8	30	38	351	1,194	1,545	100	187	287
- Sawmills	1	28	29	35	29	64	3,079	1,303	4,382	81	321	402
- Remilled Rubber	3	9	12	10	11	21	193	612	805	486	249	735
2. North Sumatera, of which:	96	601	697	1,127	1,452	2,579	27,164	22,142	49,306	30,065	7,664	37,729
- Tea	3	4	7	2	5	7	530	29	559	3,281	30	3,311
- Textile	9	6	15	559	43	602	3,948	185	4,133	2,184	145	2,329
- Remilled rubber	37	22	59	155	36	191	10,763	1,101	11,864	15,559	434	15,993
- Dried tobacco leaves & cigarettes	10	3	13	126	16	142	2,218	154	2,372	3,135	80	3,215
3. West Sumatera of which:	20	133	153	126	263	389	22,235	2,083	24,318	10,402	2,101	12,503
- Cement	1	-	1	17	-	17	18,085	-	18,085	1,450	-	1,450
- Remilled rubber	7	1	8	29	3	32	2,201	48	2,249	2,744	12	2,756
- Tea	1	-	1	1	-	1	31	-	31	4,872	-	4,872
- Cotton fabrics	3	32	35	5	34	39	460	15	275	531	647	1,178
4. Riau, of which:	9	334	343	22	321	343	2,088	8,321	10,409	691	3,964	4,655
- Remilled rubber	6	61	67	12	33	45	1,547	724	2,271	507	1,231	1,738
- Tapioca flour	-	84	84	-	84	84	-	1,812	1,812	-	920	920
- Sawn wildwood	1	46	47	5	48	53	255	2,472	2,727	60	506	566

Table A.15: (Continued)

	Number of Establishments			Number of Power Equipments			Total Capacity (hp.)			Number of Persons Employed		
	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total
5. Jambi, of which:	14	78	92	45	110	155	6,735	3,851	10,586	2,852	1,071	3,923
- Remilled rubber	14	14	28	45	17	62	6,735	196	6,931	2,852	402	3,254
- Sawn teakwood	-	3	3	-	4	4	-	1,076	1,076	-	34	34
- Coconut oil	-	8	8	-	11	11	-	957	957	-	170	170
6. Lampung, of which:	21	158	179	66	157	223	17,013	6,828	23,841	3,933	2,023	5,956
- Remilled rubber	9	-	9	66	-	66	15,828	-	15,828	2,851	-	2,851
- Grain mill products	9	22	31	-	-	-	755	697	1,452	916	467	1,383
- Tapioca flour	2	33	35	-	39	130	1,469	1,599	112	468	580	580
7. South Sumatera of which:	28	371	399	297	661	958	15,794	14,053	29,847	6,270	4,017	10,277
- Remilled rubber	15	12	27	53	26	79	11,260	1,772	13,032	3,473	299	3,772
- Sawn teakwood	-	105	105	-	137	137	-	5,062	5,062	-	980	980
- Ceramics	1	2	3	120	-	120	1,830	-	1,830	855	28	883
8. Bengkulu, of which:	-	14	14	-	22	22	-	486	486	-	131	131
- Coffee sorting	-	6	6	-	10	10	-	288	288	-	75	75
Total Sumatera	198	1,774	1,972	1,758	3,118	4,876	95,594	61,599	157,193	58,530	22,034	80,564

Table A.15: (Continued)

	Number of Establishments			Number of Power Equipments			Total Capacity (hp.)			Number of Persons Employed		
	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total
1. D.C.I. Jakarta, of which:	222	1,327	1,549	2,459	2,753	5,212	387,471	35,120	422,591	31,267	22,526	53,793
- Food, drink and tobacco	24	171	195	114	180	294	134,730	5,877	140,607	3,352	2,875	6,229
- Textile and apparels	56	468	524	741	967	1,708	5,686	7,275	12,961	5,970	7,792	13,762
- Printing office	22	85	107	410	429	838	2,116	8,122	10,238	3,651	1,503	5,154
- Varnishes, paints and pharmaceutical	19	62	81	138	105	243	4,444	1,320	5,764	2,295	1,126	3,421
- Metal works and metal products	26	118	144	338	289	627	4,149	2,564	6,713	3,214	1,976	5,190
- Machinery-electrical and non-electrical and repairs	20	110	130	79	291	370	218,858	2,053	220,911	4,225	1,655	5,880
2. West Java, of which:	498	2,006	2,504	17,612	6,571	24,183	174,645	38,344	212,989	152,588	32,933	185,521
- Tea processing	45	55	100	1,015	79	1,094	11,614	614	12,228	50,721	1,318	52,039
- Cotton yarn and cotton fabrics	170	370	540	12,614	3,204	15,818	106,966	3,413	110,379	29,437	6,252	35,689
- Remilled rubber	86	96	182	411	117	528	8,577	2,794	11,371	33,553	2,081	35,634
- Rice milling	52	357	409	59	588	647	2,521	14,410	16,931	10,262	4,608	14,870
3. Jogjakarta, of which:	29	612	641	1,854	285	2,139	21,559	1,560	23,119	8,320	9,400	17,720
- Textile and batik	6	329	335	1,283	77	1,360	4,523	111	4,634	3,234	5,307	8,541
- Sugar	1	-	1	339	-	339	14,772	-	14,772	1,706	-	1,706

Table A.15: (Continued)

	Number of Establishments			Number of Power Equipments			Total Capacity (hp.)			Number of Persons Employed		
	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total	Large	Medium	Total
4. Central Java, of which:	363	4,370	4,733	5,692	2,413	8,105	61,325	24,351	85,676	127,224	74,739	201,963
- Weaving and spinning mills	78	1,846	1,924	3,594	346	3,940	14,567	1,137	15,704	24,007	32,368	56,375
- Cretec cigarettes	88	86	174	135	38	173	791	53	844	37,207	3,542	40,749
- Tea	5	65	70	7	-	7	414	-	414	15,958	2,401	18,359
- Sugar	10	15	25	401	5	406	18,664	33	18,697	10,935	472	11,407
- Batiks	3	894	897	10	2	12	1,075	24	1,099	473	10,755	11,228
- Rice milling	12	175	187	36	286	322	393	6,706	7,599	5,637	2,367	8,004
- Remilled rubber	8	4	12	37	13	50	836	202	1,038	3,906	99	4,005
5. East Java, of which:	562	3,889	4,450	8,519	6,160	14,679	308,640	60,367	369,007	200,409	69,784	270,193
- Sugar	32	10	42	1,038	12	1,050	223,062	117	223,179	49,052	71	49,123
-Tobacco and Products	175	599	774	304	59	363	3,320	373	3,693	59,689	19,623	79,312
- Cotton yarn, fabrics, batik and products	61	489	550	3,161	1,937	5,098	16,822	1,958	18,780	14,131	9,284	23,415
- Rice Milling and cleaning	50	710	760	106	1,020	1,126	5,493	25,104	30,597	8,626	8,177	16,803
- Coffee	38	42	80	140	80	220	6,001	783	6,784	15,319	589	15,908
Total Java and Madura	1,674	12,203	13,877	36,136	18,182	54,318	953,640	159,742	1,113,382	519,808	209,382	729,190

Table A.16: PERCENTAGE SHARE OF EMPLOYED PERSONS BY SECTOR, 1971

	Indonesia		D.K.I. Jakarta		West Java		Central Java		Jogjakarta		East Java		Sumatera		Kalimantan		Sulawesi		Other Islands	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Agriculture, Hunting, Forestry & Fishing	10.3	72.3	3.4	-	6.5	64.5	5.3	63.3	6.5	63.4	9.2	76.0	17.0	81.7	30.3	82.7	19.0	72.6	17.4	80.2
Mining & Quarrying	0.8	0.1	0.3	-	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.3	3.7	0.3	0.7	0.3	0.1	0.0	0.3	0.0
Manufacturing	11.4	6.8	9.2	-	12.1	6.1	19.9	12.4	14.4	15.7	12.0	4.8	7.2	2.0	6.3	1.6	13.9	9.5	9.4	6.6
Electricity, Gas, Water	0.5	0.0	0.6	-	0.5	0.1	0.4	0.0	0.2	0.0	0.5	0.0	0.5	0.0	0.5	0.1	0.2	0.0	0.4	0.1
Construction	5.0	1.3	7.0	-	4.9	2.4	4.0	1.1	2.9	1.6	4.5	0.9	4.1	1.2	2.8	1.2	6.4	0.8	5.5	1.7
Trade, Restaurants & Hotels	25.1	8.0	24.8	-	24.0	10.8	28.5	12.4	29.1	10.6	27.2	7.8	26.9	3.5	17.4	2.9	18.9	4.7	17.6	3.5
Transport, Storage, Communication	8.9	1.2	10.6	-	9.4	2.3	7.1	1.3	6.3	0.7	9.0	0.6	7.6	1.0	10.9	0.9	10.0	2.2	4.3	0.5
Financing, Insurance, Real Estate & Business Services	1.5	0.0	2.8	-	1.1	0.0	1.3	0.0	0.9	0.1	1.1	0.0	1.3	0.0	0.5	0.0	1.4	0.0	0.5	0.0
Community, Social & Personal Service	32.0	6.2	35.6	-	35.3	7.2	30.6	7.1	37.4	5.9	34.1	6.0	27.0	5.4	23.9	4.1	26.0	7.0	35.5	4.3
Others	4.6	4.0	5.7	-	6.1	6.5	2.7	2.3	2.3	2.0	2.5	3.6	4.9	4.7	6.6	6.4	4.1	3.2	9.0	3.0
Total	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Central Bureau of Statistics, 1971 Census of Population

Table A.17:

ILLITERACY AND UNIVERSITY ATTENDANCE RATES IN URBAN AND RURAL AREAS BY REGIONS OF POPULATION OF 10 YEARS OF AGE AND OVER, 1971

Region	Illiteracy Rate (%)			University Attendance (per 1,000)		
	Total	Urban	Rural	Total	Urban	Rural
Indonesia	40	21	45	1.4	6.9	0.2
D.C.I. Jakarta	21	21	-	12.3	12.3	-
West Java	39	16	42	0.8	5.0	0.2
Central Java	44	24	47	1.0	6.8	0.2
D.I. Jogjakarta	46	22	51	2.4	12.6	0.3
East Java	48	26	51	1.1	5.8	0.2
Sumatera	29	15	32	0.8	3.4	0.1
Kalimantan	45	24	50	0.2	0.8	0.0
Sulawesi	40	24	44	1.4	6.1	0.4
Other Islands	47	21	50	1.3	9.1	0.4

Source: Central Bureau of Statistics, 1971 Population Census

Table A.18: GROSS DOMESTIC REGIONAL PRODUCTION AT CONSTANT 1969 PRICES FOR PROVINCES IN INDONESIA, 1969-71
(Rp Million)

	AGRICULTURE			MINING & QUARRYING			MANUFACTURING			CONSTRUCTION			THE REST		
	Gross Value Added	% Share	% Growth Rate 1969-71	Gross Value Added	% Share	% Growth Rate	Gross Value Added	% Share	% Growth Rate	Gross Value Added	% Share	% Growth Rate	Gross Value Added	% Share	% Growth Rate
DKI Jakarta	19,673	8.5	12.7	-	-	-	18,483	8.0	1.4	11,235	4.8	7.5	182,891	78.7	10.4
West Java	190,239	51.2	12.1	193	0.1	19.8	37,238	10.0	6.4	10,039	2.7	2.1	133,637	36.0	7.5
Central Java	191,966	50.7	2.8	1,970	0.5	34.0	48,480	12.8	3.6	7,197	1.9	7.8	128,827	34.1	5.2
DI Jogjakarta 1/	17,237	36.1	-	2,401	5.0	-	10,735	22.5	-	909	1.9	-	16,492	34.5	-
East Java	267,227	50.2	6.5	895	0.2	12.2	52,906	9.9	7.4	2,476	0.5	1.3	209,140	39.2	3.0
Aceh 2/	24,540	55.5	5.8	-	-	-	5,965	13.5	-4.0	222	0.5	4.1	13,524	30.5	6.3
West Sumatera	28,137	44.2	3.5	208	0.3	11.0	4,051	6.4	7.3	140	0.2	20.0	31,186	48.9	15.8
Riau	21,198	10.7	2.1	122,262	61.6	11.2	943	0.5	7.9	1,327	0.7	3.0	52,823	26.5	7.1
Lampung 1/	37,675	59.6	-	-	-	-	1,156	1.8	-	1,043	1.7	-	23,302	36.9	-
West Kalimantan	26,491	52.0	7.1	-	-	-	5,402	10.6	8.4	1,356	2.7	-7.3	17,717	34.7	6.0
South Kalimantan	20,176	48.8	17.0	1,460	3.5	10.7	1,818	4.4	20.0	625	1.5	2.4	17,235	41.8	13.8
North Sulawesi	19,263	41.6	8.8	101	0.2	11.9	3,346	7.2	7.0	1,510	3.3	19.1	22,037	47.7	8.3
Central Sulawesi	6,610	63.5	4.6	-	-	-	113	1.1	15.8	246	2.4	50.0	3,426	33.0	6.3
Southeast Sulawesi 2/	6,315	62.8	4.0	1,975	19.6	75.8	39	0.4	43.8	226	2.2	3.2	1,505	15.0	8.5
West Nusa Tenggara	21,732	66.8	3.5	-	-	-	277	0.9	7.8	207	0.6	2.4	10,332	31.7	5.1
East Nusa Tenggara	18,300	69.7	0.6	-	-	-	528	2.0	15.5	157	0.6	19.0	7,271	27.7	7.0
Maluku 1/	17,643	75.8	-	-	-	-	489	2.1	-	48	0.2	-	5,084	21.9	-
Irian Jaya	694	59.0	1.4	27	2.3	4.6	13	1.1	-4.1	45	3.8	-9.9	397	33.8	14.8

1/ 1969 data only.
2/ The average of 1969 and 1970 data.

Source: Biro Pusat Statistik Jakarta.

Table A.19: SOME BASIC REGIONAL ECONOMIC DATA

	Production, 1971					Apparent rice consumption 1971		Regional Product 1969-71		Daily Wage Rates 1971/72		
	Rice	Maize	Rubber	Coffee	Timber	Aggregate	Per Capita	Aggregate	Per Capita	Unskilled	Semi-skilled	Skilled
	(.....thousand metric tons.....)				(thous. m^3)	('000 tons)	kg	(Million Rp)	(.....rupiah.....)			
DKI Jakarta Raya	13.1	.8	-	-	-	)2,844	)109	232 82	53093	200	350	400
West Java	2,607.3	99.2	21.0	9.9	-	)	)	371346	17526	155	201	239
Central Java	2,138.6	632.0	-	7.0	-	)2,244	) 92	378440	17593	95	109	130
DI Jogjakarta	138.6	41.9	-	.0	-	)	)	47774	19611	85	142	128
East Java	2,029.6	1,122.6	-	8.0		1,895	74	532644	21200	118	215	273
Java/Madura												
DI Aceh	425.1	1.7	8.5	11.1	-	430	214	44251	22485	168	298	368
North Sumatera	989.8	43.5	52.8	8.4	-	1,075	162	n.a.	n.a.	243	n.a.	n.a.
West Sumatera	422.7	6.3	23.7	9.1	-	431	154	63722	23248	182	273	387
Riau	183.4	5.2	69.0	.4	1,032.3	236	143	198553	124641	308	458	567
Jambi	166.4	1.8	86.2	13.5	-	179	178	n.a.	n.a.	285	364	428
South Sumatera	383.5	6.1	125.3	46.9	-	513	149	n.a.	n.a.	235	354	405
Bengkulu	113.0	3.6	7.0	13.7	-	) 376	) 114	n.a.	n.a.	250	331	381
Lampung	250.3	111.4	6.5	30.0	-	)	)	63175	24249	187	287	337
Sumatera												
West Kalimantan	212.8	4.3	110.0	.7	-	266	132	50966	25858	320	400	500
Central Kalimantan	87.2	3.2	17.0	.3	1,110.0	89	127	n.a.	n.a.	366	450	500
South Kalimantan	243.6	2.4	39.0	.0	-	253	149	41314	24650	200	275	333
East Kalimantan	67.9	1.4	.2	.6	-	100	136	n.a.	n.a.	375	600	725
Kalimantan												
North Sulawesi	96.3	62.9	-	1.3	-	150	87	46257	27682	249	332	379
Central Sulawesi	78.3	29.1	-	.0	-	93	102	10395	11693	138	238	289
South Sulawesi	841.5	153.4	.1	6.0	-	775	149	n.a.	n.a.	148	284	348
Southeast Sulawesi	48.9	39.5	-	.2	-	52	73	10060	14433	100	150	300
Sulawesi												
Bali	318.3	60.8	-	7.4	-	324	153	n.a.	n.a.	124	195	203
West Nusa Tenggara	78.3	32.4	-	1.3	-	76	35	32548	15076	113	256	308
East Nusa Tenggara	78.7	145.5	-	1.7	6.5	107	47	26256	11623	101	218	283
Bali/Nusa Tenggara												
Maluku	11.5	19.7	-	.1	-	38	35	23264	22731	n.a.	n.a.	n.a.
Irian Barat	.6	1.4	-	.1	-	41	44	1176	1299	n.a.	n.a.	n.a.
Maluku/Irian Barat												
Indonesia								2,920,100	24,497			

Source: BAPPENAS and Biro Pusat Statistik

Table A.20: CENTRAL GOVERNMENT TAX RECEIPTS BY REGIONS[1/] 1969-72
(Amount in Million rupiahs)

	1969/70		1970/71		1971/72		1972/73		Per Capita Receipts
	Amount	Index	Amount	Index	Amount	Index	Amount	Index	1971/72
Northern Sumatera[2/]	6,603	100	7,035	107	8,803	133	11,554	175	673
Southern Sumatera[3/]	4,228	100	4,573	108	5,311	126	6,599	156	686
Jakarta DKI	30,370	100	38,678	127	53,996	177	74,505	245	11,800
West Java	2,682	100	3,153	118	4,540	169	6,126	228	210
Central Java	4,287	100	5,555	130	7,067	165	8,710	203	323
North Eastern Java	5,134	100	8,132	158	9,555	186	14,244	277)	372
South Eastern Java[4/]	2,647	100	2,517	95	3,348	126	4,564	172)	
Kalimantan	2,223	100	2,670	120	3,357	151	4,326	195	652
Sulawesi/Maluku/Irian Jaya	1,236	100	1,557	126	2,437	197	3,460	280	231
Others	-	-	-	-	290	-	55	-	
Total	59,410	100	73,870	124	98,704	166	134,143	226	828

1/ Excludes tax on oil companies
2/ Includes provinces of North Sumatra, Aceh, Riau, and West Sumatera
3/ Includes provinces of Jambi, South Sumatera,Lampung
4/ Includes Bali and Nusa Tenggara

Source: Ministry of Finance, GOI

Table A.21: THE PERCENTAGE OF URBAN POPULATION OF PROVINCES GROUPED BY THE PER CAPITA GDP IN 1969

per capita GDP in 1969	Province	Percentage of Urban Population
Rp 25,000 and over	D.K.I. Jakarta	100.0
	South Sumatera	29.1
	North Sulawesi	19.5
	Riau	13.3
	West Kalimantan	12.8
From Rp 20,000 to Rp 25,000	South Kalimantan	26.7
	West Sumatera	17.2
	East Java	14.5
	Maluku	13.3
	D.I. Aceh	9.9
From Rp 15,000 to Rp 20,000	D.I. Jogjakarta	16.4
	West Java	12.4
	Central Java	10.8
Less than Rp 15,000	West Nusa Tenggara	8.1
	Central Sulawesi	8.0
	Southeast Sulawesi	7.3
	East Nusa Tenggara	5.6

Source: Text Tables 6 and 1

Table A.22: INDONESIA ENROLLMENT RATES 1971

Province	Primary (Gr. 1-6) Population (7-12) (thousands)	Gross a/ Enrollment Rate (%)	Net b/ Enrollment Rate (%)	Lower Secondary (Gr. 7-9) Population (13-15) (thousands)	Gross a/ Enrollment Rate (%)	Net b/ Enrollment Rate (%)	Upper Secondary (Gr. 10-12) Population (16-18) (thousands)	Gross a/ Enrollment Rate (%)	Net b/ Enrollment Rate (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
01 Jakarta	681	83	69	314	36	23	295	21	13
02 West Java	3,581	75	62	1,417	15	10	1,131	10	7
03 Central Java	3,615	75	62	1,497	23	14	1,227	13	9
04 Jogjakarta	401	89	73	182	41	25	150	37	24
05 East Java	3,952	82	62	1,598	19	12	1,353	10	6
Sub-Total: Java	(12,231)	(78)	(63)	(5,007)	(21)	(13)	(4,156)	(13)	(8)
06 Aceh	299	86	78	120	28	17	113	13	7
07 North Sumatera	1,342	85	71	501	29	19	404	19	13
08 West Sumatera	415	99	83	216	30	19	164	19	13
09 Riau	251	88	82	121	45	25	104	10	7
10 Jambi	155	92	84	72	24	14	59	14	8
11 South Sumatera	533	91	74	250)	22	12	213)	10	8
12 Bengkulu	87	95	80	39)			30)		
13 Lampung	469	73	84	180	19	11	145	10	6
Sub-Total: Sumatera	(3,569)	(87)	(76)	(1,498)	(28)	(17)	(1,232)	(15)	(10)
14 West Kalimantan	330	66	52	143	14	7	114	6	3
15 Central Kalimantan	121	77	61	50	21	12	40	8	4
16 South Kalimantan	295	81	69	114	22	12	95	14	10
17 East Kalimantan	113	78	61	48	22	12	48	9	5
Sub-Total: Kalimantan	(858)	(74)	(60)	(355)	(19)	(10)	(297)	(9)	(6)
18 North Sulawesi	331	94	73	128	31	21	105	26	18
19 Central Sulawesi	175	88	67	62	31	17	53	15	9
20 South Sulawesi	810	89	72	330	22	15	276	14	9
21 Southeast Sulawesi	128	85	68	45	27	12	38	13	9
Sub-Total: Sulawesi	(1,444)	(89)	(71)	(565)	(26)	(16)	(473)	(17)	(11)
22 Maluku	186	98	75	80	28	16	57	16	10
23 Bali	344	73	62	116	26	16	110	12	8
24 West Nusatengara	359	66	54	126	14	9	97	9	6
25 East Nusatengara	381	91	68	155	19	9	114	8	5
26 Irian Jaya	128	85	66	66	13	5	69	4	4
Sub-Total: Other Islands	(1,398)	(80)	(64)	(544)	(20)	(11)	(447)	(10)	(6)
INDONESIA: TOTAL	19,500	80	68	7,969	22	14	6,605	13	9

a/ Gross enrollment rate = enrollment by level as a percent of population in the age group.
b/ Net enrollment rate = percent of eligible students enrolled in the appropriate level. This ratio excludes overaged students.

Table A.23: NUMBER OF HEALTH PERSONNEL, HOSPITALS, CLINICS, ETC. BY PROVINCE PER 1,000 PERSONS

No. Urut	Propinsi/Province	Dokter Physicians	Bidan Midwives	Perawat Nurses	Banyaknya Rumah Sakit Hospital	Banyaknya Tempat tidur Beds	B.K.I.A. Mothers and children well-fare board	Poliklinik Policlinics
1.	D.I. Aceh	0,13	0,58	1,11	0,16	9,68	0,40	0,92
2.	Sumatera Utara	0,65	0,83	2,40	0,18	17,30	0,55	1,04
3.	Sumatera Barat	0,51	1,54	1,28	0,09	5,00	0,80	0,55
4.	Riau	0,25	0,61	1,10	0,15	3,44	0,45	0,62
5.	Jambi	0,31	0,61	1,64	0,08	5,10	0,46	0,68
6.	Sumatera Selatan	0,48	0,69	2,45	0,09	9,01	0,46	0,59
7.	Bengkulu	0,51	0,71	2,24	0,10	4,72	0,84	1,16
8.	Lampung	0,18	0,54	1,16	0,08	2,73	0,51	0,28
9.	D.K.I. Jakarta Raya	3,54	0,94	3,28	0,27	14,34	0,31	1,26
10.	Jawa Barat	0,25	0,22	0,89	0,06	4,93	0,30	0,62
11.	Jawa Tengah	0,21	0,47	0,81	0,04	5,06	0,41	0,70
12.	D.I. Jogjakarta	0,89	0,52	1,05	0,15	11,99	0,80	0,59
13.	Jawa Timur	0,39	0,45	0,67	0,05	4,96	0,46	0,36
14.	Bali	0,19	1,12	0,94	0,11	9,18	1,07	0,96
15.	Nusa Tenggara Barat	0,09	0,23	0,54	0,05	4,15	0,43	0,35
16.	Nusa Tanggara Timur	0,11	0,27	1,11	0,12	6,41	0,57	0,50
17.	Kalimantan Barat	0,19	0,39	0,91	0,13	6,79	0,46	0,60
18.	Kalimantan Tengah	0,16	0,68	3,28	0,16	4,64	0,42	1,75
19.	Kalimantan Selatan	0,20	0,63	1,55	0,10	4,91	0,87	1,27
20.	Kalimantan Timur	0,62	1,07	2,16	0,22	16,27	0,76	1,37
21.	Sulawesi Utara	0,54	0,59	2,34	0,26	23,55	1,15	0,89
22.	Sulawesi Tengah	0,22	0,31	2,03	0,12	6,41	0,77	1,05
23.	Sulawesi Selatan	0,20	0,38	2,12	0,25	5,67	0,65	0,31
24.	Sulawesi Tenggara	0,16	0,19	1,14	0,21	6,68	0,34	1,14
25.	Maluku	0,36	0,68	2,22	0,26	13,33	0,61	0,34
26.	Irian Jaya	....	....	....	0,38	24,12	1,45	1,76
	Indonesia	0,46	0,53	1,27	0,10	7,41	0,51	0,69

*) Catatan: Berdasarkan perkiraan penduduk akhir tahun
Sumber: Departemen Kesehatan dan B.P.S.

*) Note: Based on the estimated end year population.
Source: Department of health and C.B.S.

Table A.24: PERCENT DISTRIBUTION OF PER CAPITA CONSUMPTION 1969
(In Per Cent)

Area	Income Group 1/	Cereals	Cassava	Other Food	Total Food	Clothing Footwear	Housing	All Other
Java Rural	Poorest	33.6	17.3	31.1	82.0	3.7	9.3	5.0
	Poor	41.3	5.8	33.3	80.4	4.8	8.5	6.3
	Intermediate	32.1	3.3	42.0	77.4	5.3	8.0	9.3
	Rich	20.4	2.3	48.2	70.9	5.8	7.1	16.2
Java Urban	Poorest	40.4	13.6	26.1	80.1	6.8	6.7	6.4
	Poor	40.3	1.8	34.6	76.7	5.8	9.9	7.6
	Intermediate	28.9	1.3	42.5	72.7	7.0	9.6	10.7
	Rich	13.1	0.6	50.1	63.8	7.2	9.2	19.8
Outer Island Rural	Poorest	36.7	10.7	34.0	81.4	4.6	8.9	5.1
	Poor	38.1	4.3	40.4	82.8	4.9	6.4	5.9
	Intermediate	31.0	2.9	45.9	79.8	5.8	6.6	7.8
	Rich	20.2	2.0	53.5	75.7	5.6	5.0	12.8
Outer Island Urban	Poorest	-	8.9	50.7	59.5	7.4	22.0	11.1
	Poor	39.6	1.8	38.0	79.4	4.6	9.5	6.5
	Intermediate	28.0	2.0	47.6	77.6	6.1	9.1	7.2
	Rich	16.6	1.0	55.4	73.0	5.8	9.8	11.4
Indonesia	Poorest	34.6	15.7	31.3	81.6	4.1	9.1	5.2
	Poor	40.5	5.1	35.0	80.6	4.9	8.2	6.3
	Intermediate	31.0	2.8	43.6	77.4	5.8	7.9	8.9
	Rich	18.1	1.6	51.4	71.1	6.1	7.5	15.3

1/ Poorest = expenditure of less than 300 Rps. per month
Poor = expenditure of 751 - 1,000 Rps. per month
Intermediate = expenditure of 1,501 - 2,000 Rps. per month
"Rich" = expenditure of over 3,001 Rps. per month
Exchange rate in 1969: 378

Table A.25: INTERINSULAR PASSENGER FLOWS IN 10 MAJOR PORTS

('000 passengers)

	1966			1967			1968			1969			1970		
	In-coming	Out-going	Net Inflow+ Net Outflow-	In-coming	Out-going	Net Inflow+ Net Outflow-	In-coming	Out-going	Net Inflow+ Net Outflow-	In-coming	Out-going	Net Inflow+ Net Outflow-	In-coming	Out-going	Net Inflow+ Net Outflow-
Bitung (N. Sulawesi)	24	18	+6	22	16	+6	25	14	+11	22	10	+12	na	na	na
Makassar (S. Sulawesi)	na	na	na	34	30	+4	32	31	+ 1	37	33	+ 4	29	36	-7
Banjarmasin (S. Kalimantan)	17	16	+1	7	7	-	4	4	-	6	6	-	6	6	-
Belawan (N. Sumatera)	na	na	na	34	35	-1	19	24	- 5	26	36	-10	na	na	na
Padang (W. Sumatera)	46	48	-2	27	31	-4	31	33	- 2	33	37	- 4	39	39	-
Palembang (S. Sumatera)	3	2	+1	1	1	-	1	1	-	-	-	-	-	-	-
Pajang (Lampung) a/	512	519	-7	357	332	+25	420	373	+47	368	318	+50	430	380	+50
Merak (W. Java) a/	519	512	+7	332	357	-25	373	420	-47	318	368	-50	380	430	-50
Tanjang Priok (W. Java)	na	na	na	96	81	+15	72	64	+ 8	92	78	+14	84	62	+22
Semarang (C. Java)	na	na	na	na	na	na	na	na	na	na	na	na	-	3	- 3
Surabaja (E. Java)	na	na	na	na	na	na	20	12	+ 8	10	13	- 3	25	22	+ 3

a/ Sumatera-Java Ferry Service only. Covers about 95% of all passenger traffic through these ports.

Source:
- NEDECO, Port and Dredging Projects in Indonesia, 1971, and additional information from NEDECO.
- KAMPSAX, Sumatera Java Transportation System, 1971.
- KAMPSAX, Indonesia 1968-1970 Highway Services, 1969.
- ENEX, Feasibility Study, The Ferry Link: Telukbetung-Bakauhuni - Mirak

Table A.26: MIGRATION OF JAVANESE LABOR TO AND FROM ESTATES IN NORTH SUMATERA, SINCE 1961 (number of families) 1/

Year	Government Estates	Private Estates	Total	Government Estates	Private Estates	Total
1961	1,454	-	1,454	n.a.	n.a.	n.a.
1962	3,437	-	3,437	n.a.	n.a.	n.a.
1963	5,948	-	5,948	n.a.	n.a.	n.a.
1964	6,237	-	6,237	n.a.	n.a.	n.a.
1965	2,802	-	2,802	n.a.	n.a.	n.a.
1966	4,177	375	4,552	n.a.	n.a.	n.a.
1967	1,468	307	1,775	n.a.	n.a.	600 2/
1968	375	33	408	n.a.	n.a.	450 3/
1969	513	378	891	850	149	999
1970	970	217	1,187	1,115	157	1,272
1971	114	-	114	872	294	1,166
1961-1971	27,495	1,310	28,805	n.a.	n.a.	n.a.

1/ There are two workers per family, at the moment of recruitment. Returning families may, on average, have less than two workers.

2/ All originating from Central Java (Jogjakarta, Solo, Purwokerto, Wonogiri, Purworedgo, Banjumas, i.e., the lowest income regions of Java).

3/ Mission estimates on the basis of other data.

Source: BCU-PNP MEDAN.

Table A.27: THE EDUCATIONAL ATTAINMENT OF MIGRANTS TO JAKARTA FROM 1961 TO 1971 BY PROVINCE OF ORIGIN

(percentage)

Province	No School-ing	Grammar School	Junior High School	Senior High School	Academy/ University
1. Aceh	13.63	41.33	18.78	20.93	5.32
2. North Sumatera	7.53	33.15	22.57	29.64	6.18
3. West Sumatera	12.25	42.68	19.12	31.77	4.19
4. Riau	21.61	44.01	13.21	15.49	5.69
5. Jambi	11.88	47.53	18.69	17.18	4.68
6. Bengkulu	15.27	43.61	18.00	18.34	4.78
7. South Sumatera	12.09	50.50	15.96	23.66	7.80
8. Lampung	34.54	50.82	7.26	5.67	1.71
9. D.K.I. Jakarta	-	-	-	-	-
10. West Java	32.77	49.95	13.45	10.09	2.75
11. Central Java	13.29	41.60	18.67	18.12	8.32
12. Jogjakarta	15.78	43.31	17.85	17.06	6.00
13. East Java	10.93	36.88	19.13	27.61	4.43
14. West Kalimantan	10.25	44.04	16.48	22.19	7.04
15. Central Kalimantan	12.13	40.72	16.85	24.24	8.07
16. South Kalimantan	14.78	44.07	20.97	14.89	5.30
17. East Kalimantan	4.89	36.33	27.65	24.49	6.64
18. North Sulawesi	24.90	42.53	11.75	17.21	5.59
19. Central Sulawesi	15.76	43.38	18.34	16.56	5.96
20. South Sulawesi	4.99	47.03	21.99	20.62	5.38
21. Southeast Sulawesi	8.18	42.85	20.22	21.53	7.21
22. Bali	12.91	35.60	15.74	24.83	10.92
23. West Nusa Tenggara	8.97	46.54	18.06	17.87	8.55
24. East Nusa Tenggara	16.58	53.79	16.25	10.57	2.81
25. Maluku	12.82	42.34	20.16	16.90	7.77
26. Irian Jaya	100.00	-	-	-	-
Total	25.00	47.95	12.50	11.07	3.48

Note: Figures of Grammar School includes Grammar School dropouts.

Source: Suharso, "Cityward Migration and Educational Attainment in Jakarta-Indonesia", UNIESCO/PDEP/7-1, September 1973.

Table A.28: JAVA FREIGHT CHARGES FOR SELECTED COASTAL SHIPPING ROUTES 1/

Route	Distance (Km)	Rupiahs per Ton/Kilometer Lowest 2/	Base Rate 3/	Highest 4/
Semarang-Cirebon	204	4.4	5.5	24.8
Tanjung Priok- Cirebon	278	3.8	4.7	21.2
Surabaya-Semarang	350	3.4	4.2	18.9
Tanjung Priok-Semarang	437	3.0	3.8	16.9
Surabaya- Cirebon	514	2.8	3.5	15.6
Tanjung Priok-Surabaya	725	2.3	2.9	13.1

1/ These rates were still in effect in August 1972.
2/ Includes rice, bulgur, sugar, kapok, cement, fertilizer, tea; "essential commods" coefficient of 0.8 to base rate.
3/ Includes fish, paper, peanuts, salt.
4/ Includes cosmetic items, imported carpets, photographic equipment, luxury items; coefficient of 4.5 to base rate.

Source: Tariff Rates, BOPERPAN, November 1969

Table A.29: PROPORTION OF TOTAL FREIGHT TRAFFIC ON DIFFERENT MODES OF TRANSPORT, JAPAN, 1963
(Percentage)

Distance (kilometres)	Rail	Truck	Coastal Water
1 - 50	2.1	97.1	0.8
51 - 100	18.2	73.9	7.9
101 - 200	39.7	43.4	16.9
201 - 400	49.5	16.6	33.8
401 - 600	45.6	12.2	42.2
601 or over	37.0	3.1	59.9

Source: Japan, Ministry of Transport, Transport White Paper (Tokyo, 1965), p.7.

Reproduced from Kobe, Susumu, Transport Modes and Technologies for Development, United Nations, New York, 1970, p. 25.

Table A.30: TOTAL HIGHWAY TONS, 1969
('000 tons)

Province	Total Tons, Intra-Provincial	Total Tons, Inter-Provincial (Originating)	Total Tons, Inter-Provincial (Destination)
West Java	6,894.7	404.6	556.2
Central Java	2,732.3	753.5	971.0
East Java	5,403.2	914.0	591.5
South Sumatera	152.2	32.9	51.5
Lampung	410.1	-	.7
Bengkulu	34.6	50.4	29.6
Jambi	14.6	15.3	16.1
Riau	65.6	38.3	99.6
Aceh	97.5	61.7	75.9
West Sumatera	279.6	125.9	76.7
North Sumatera	831.5	137.2	112.8
Bali	296.6	95.2	48.3
West Kalimantan	80.7	-	-
East Kalimantan	2.6	-	-
South Kalimantan	171.2	-	.7
South Sulawesi	830.1	-	-
North Sulawesi	67.5	-	-
TOTAL	18,364.6	2,629.0	2,630.6

From TCAS estimates based on 1969 Origin and Destination Survey.

Table A.31: PERCENT OF HIGHWAY TRAFFIC, INTRA- AND INTER-PROVINCIAL BY PROVINCE, 1969

Province	Intra-Provincial	Inter Provincial	Total
	(Percent)		
West Java	94.5	5.5	100
Central Java	78.4	21.6	100
East Java	85.5	14.5	100
South Sumatera	82.2	17.8	100
Lampung	100.0	-	100
Bengkulu	40.7	59.3	100
Jambi	48.8	51.2	100
Riau	63.2	36.8	100
Aceh	61.2	38.8	100
West Sumatera	69.0	31.0	100
North Sumatera	85.8	14.2	100
Bali	75.7	24.2	100
West Kalimantan	100.0	-	100
East Kalimantan	100.0	-	100
South Kalimantan	100.0	-	100
South Sulawesi	100.0	-	100
North Sulawesi	100.0	-	100
TOTAL	87.5	12.5	100

From TCAS estimates based on 1969 Origin and Destination Survey.

Table A.32: DISTRIBUTION TO PROVINCES OF DEVELOPMENT PROJECTS DIRECTLY FINANCED BY THE CENTRAL GOVERNMENT

	Rp million					Rp
	Actuals			Budget	Annual Average	Per Capita Annual Average
	1969/70	1970/71	1971/72	1972/73	1969/70-1971/72	1969/70-1971/72
1. D.I. Aceh	1,770	1,666	2,372	2,208	1,936	964
2. North Sumatera	2,322	2,987	3,120	4,314	2,810	424
3. West Sumatera	976	1,573	2,027	6,534	1,525	546
4. Jambi	537	644	815	1,254	665	661
5. Riau	767	791	1,059	1,622	872	531
6. South Sumatera	2,567	2,456	2,794	4,982	2,606	757
7. Bengkulu	430	282	506	944	406	782
8. Lampung	1,491	1,467	1,386	2,536	1,448	521
9. D.K.I. Jaya 1/	3,968	3,826	5,773	6,337	4,522	988
10. West Java	12,599	10,752	10,841	21,151	11,397	527
11. Central Java	6,687	5,645	6,247	11,570	6,193	283
12. D.I. Jogjakarta	1,596	947	2,600	2,763	1,714	688
13. East Java	6,925	6,761	11,633	14,173	8,440	331
14. Bali	901	876	1,684	2,915	1,154	544
15. West Kalimantan	410	774	702	1,517	629	311
16. East Kalimantan	617	557	717	1,903	630	858
17. Central Kalimantan	111	173	405	691	230	329
18. South Kalimantan	2,287	2,589	2,739	2,830	2,538	1,494
19. North Sulawesi	1,230	1,521	1,242	2,209	1,331	775
20. Central Sulawesi	432	427	692	n.a.	517	566
21. Southeast Sulawesi	201	272	423	667	299	419
22. South Sulawesi	2,127	2,637	3,789	4,746	2,851	549
23. West Nusa Tenggara	382	560	249	681	457	208
24. East Nusa Tenggara	491	866	894	1,165	750	327
25. Maluku	481	677	757	905	638	586
26. Irian Jaya	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total 2/	52,305	51,726	65,646	100,657	56,558	478

1/ Budget, excluding National Government related development expenditure
2/ Excluding West Irian

Source: Department of Home Affairs

Table A.33: INTERCITY ROAD TRAFFIC, JAVA, 1971

Road Section and Region	Vehicles per day				Length of Road Section (kms.)
	Total	Cars	Buses	Trucks	
Jakarta-Merak	1,000	700	100	200	120
Jakarta-Labuan	500	400	-	100	150
Jakarta-Bogor	9,000	7,200	600	1,200	50
Bogor-Sukabumi	2,000	1,400	200	400	70
Bogor-Bandung	2,500	1,900	200	400	130
Sukabumi-Bandung	1,000	700	100	200	90
Jakarta-Cikampek	3,000	1,400	300	1,300	100
Cikampek-Bandung	1,500	900	200	400	70
Cikampek-Sindang	1,000	200	200	600	100
Bandung-Pamanukan	1,000	600	100	300	100
Bandung-Cirebon	1,500	900	200	400	130
Bandung-Ciamis	1,000	600	100	300	120
WEST JAVA					
Cirebon-Semarang	1,500	700	200	600	490
Ciamis-Semarang	500	300	100	100	330
Semarang-Jogjakarta	1,500	900	200	400	120
Semarang-Rembang	500	300	100	100	110
Semarang-Surakarta	1,500	800	200	500	100
Jogjakarta-Surakarta	2,000	1,000	400	600	60
CENTRAL JAVA					
Surakarta-Surabaya	1,000	500	100	400	280
Surabaya-Malang	3,300	1,500	500	1,300	90
Surabaya-Probolinggo	2,500	1,300	200	1,000	100
Probolinggo-Jember	1,000	500	100	400	90
Jember-Banyuwangi	500	300	-	200	120
Probolinggo-Banyuwangi	500	300	-	200	190
EAST JAVA					

Source: Unpublished IBRD mission estimates.

Table A.34: COEFFICIENTS USED TO CONVERT TRAFFIC TO TRANSPORT UNITS ON THE ASIAN HIGHWAY*

	Transport Units
Cars and motorcycles	1
Light commercial motor vehicles (axle load up to 5 tons)	1
Medium and heavy commercial motor vehicles (axle load of 5 tons or more)	3
Buses and coaches	3
Horse-drawn vehicles	6
Bullock carts	8
Bicycles	0.5

*United Nations Economic Commission for Asia and the Far East, Asian Highway Transport Technical Bureau, Highway Classification and Design Standards for the Asian Highway (1968), pg. 3.

Reproduced in Susumu Kobe, Transport Modes and Technologies for Development, United Nations, New York, 1970, pg. 33.

Table A.35: AGRICULTURAL SECTOR MISSION EXPECTATIONS

	1970	1971	1975	1980	1980/1971 Annual % of Increase
	(Reported)				
Population:					
Total (millions)		119.2	130.0	145.0	
Annual % increase	2.08			2.4	
GDP - Annual 1% increase		----------6%----------			
Range		----------5 to 7%----------			
GDP per capita (% increase)		----------3.9----------			
Range		----------2.9 to 4.9----------			
Rice Production:					
High (million tons milled)	12.0	12.7	15.5	18.1	4.0
Low (million tons milled)	12.0	12.7	14.5	16.6	3.0
Rice Area:					
High (million hectares)	8.2	8.5		9.7	1.5
Low (million hectares)	8.2	8.5		9.3	.9
Rice Yield:					
High (quintals/hectare)	14.7	15.0		18.6	2.4
Low (quintals/hectare)	14.7	15.0		17.8	1.9
Per Capita Rice Production:					
(net: minus 6% for seed and losses)					
High (kgs. per capita)	102.1	102.1	110.1	120.0	1.8
Low (kgs. per capita)	102.1	102.1	105.7	110.1	0.8
Rice Imports:					
High (thousand tons)	950	600	300-400	0	-
Low (thousand tons)	950	600	300-400	300-400	-
Corn and Sorghum:					
Area (1,000 ha)	3,018	2,687	3,500	4,000	4.5
Production (1,000 tons)	2,888	2,138	4,000	5,000	10.6
Yield (quintals/ha)	9.6	7.9	11.5	12.5	5.2
Exports (1,000 tons)		250	500	1,000	-
Cassava:					
Area (1,000 ha)	1,434	1,518	1,500	1,500	.1
Production (1,000 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 (1,000 tons)			200 1/	400 1/	
Sweet potatoes:					
Area (1,000 ha)	355.8	366.7	370.0	380.0	0.4
Production (1,000 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 (1,000 ha)	402	413	450	500	2.1
Production (1,000 tons)	293	299	360	500	5.9
Yield (quintals/ha)	7.3	7.2	8.0	10.0	3.7
Exports (1,000 tons)			50 1/	75 1/	-

1/ Product equivalent

A.35: Continued

	1970 (Reported)	1971 (Reported)	1975	1980	1980/1971 Annual % of Increase
Soybeans:					
Area (1,000 ha)	684	630	700	1,000	5.2
Production (1,000 tons)	488	422	560	1,000	10.6
Yield (quintals/ha)	7.1	6.7	8.0	10.0	4.6
Exports (1,000 tons)			50 1/	200-400 1/	-
Rubber:					
Area (1,000 ha)	1,969	1,972	2,000	2,200	1.2
Production (1,000 tons)	778	810	850	1,000	2.4
Yield (quintals/ha)	4.0	4.1	4.3	4.5	1.0
Exports (1,000 tons)			800	900	-
Sugar:					
Area (1,000 ha)	135	135	150	200	4.5
Production (1,000 tons)	715	833	1,100	1,500	6.7
Yield (quintals/ha)	53.0	62.0	73.0	75.0	2.1
Exports					-
Imports (1,000 tons)	118	150	50		
Coffee:					
Area (1,000 ha)	354	-	368	375	0.6
Production (1,000 tons)	182	192	232	272	3.9
Yield (quintals/ha)	5.1		6.3	7.2	3.5
Exports (1,000 tons)	97	(100)	120	150-160	-
Cloves:					
Area (1,000 ha)	83	-	100	128	5.2
Production (1,000 tons)	12.5	-	20.0	30.0	7.9
Yield (quintals/ha)	1.5	-	2.0	2.3	4.3
Exports (1,000 tons)	0	-	0	0-5	-
Imports (1,000 tons)	8.8	-	3-5		—
Tobacco:					
Area (1,000 ha)	171	-	175	190	1.1
Production (1,000 tons)	71	77	100	120	4.5
Yield (quintals/ha)	4.2	-	5.7	6.3	4.1
Exports (1,000 tons)	14.2	-	20	30	-
Imports (1,000 tons)	1.9	-	3.0	5.0	-
Pepper:	2/	2/			
Area (1,000 ha)	46.4	(1967)	50.0	55.0	1.8
Production (1,000 tons)	15.7	49.0	40.0	30-60	-
Yield (quintals/ha)	3.4		8.0	5.5-10.9	-
Exports (1,000 tons)	2.3	37.2	25-30	25-50	-
Tea:					
Area (1,000 ha)	(120)	-	110	100	1.8
Production (1,000 tons)	(85)	-	90	95	1.1
Yield (quintals/ha)	7.1	-	8.0	9.5	3.0
Exports (1,000 tons)	35	-	35	35	-
Coconuts:					
Area (1,000 ha)	1,684	-	1,750	2,000	1.7
Production (1,000 tons)	1,280	1,300	1,500	1,800	3.3
Yield (quintals/ha)	(7.5)		8.6	9.0	-
Exports (1,000 tons)	168.6 1/		200-250 1/	300-350 1/	-

1/ Product equivalent.
2/ 1970 crop was abnormally low.
( ) Estimated.

A.35: Continued

		1970	1971	1975	1980	1980/1971 Annual % of Increase
Palm Oil and Kernels:						
Area (1,000 ha)		123	126	150	200	5.3
Production (1,000 tons)	- 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 (1,000 tons)	- oil	(150)		200	300	-
	- kernels	(35)		45	55	-
Cotton:						
Area (1,000 ha)		2	2	10-30	100-150	-
Production (1,000 tons lint)		-	-	3-9	40-60	-
Yield (quintals/ha)		-	-	3.0	4.0	-
Imports (1,000 tons lint)		40	60	91-97	90-110	-

Table A.36: ESTIMATED AREA OF FOREST 1/ BY GEOGRAPHICAL LOCATION AND ECOLOGICAL TYPE

(millions of hectares)

REGION	Total Land Area	Primary Rain Forest 3/	Mixed Decidous Forest	Secondary Forest 4/	Mangrove Coastal & Swamp Forest 3/	Teak Forest 5/	Non-Teak Plantations 6/	Total Forested Area	Percent Forested
Kalimantan	54	25.7	-	9.2	6.1	-	-	41	76
Sumatera	47	15.5	-	5.6	6.9	-	-	28	60
Sulawesi	19	6.8	-	3.2	-	-	-	10	53
Java & Madura	13	0.3	1.5	-	0.1	0.8	0.3	3	23
Maluku	8	4.9	-	1.0	0.1	-	-	6	75
Nusa Tenggara	7	1.4	-	0.6	-	-	-	2	29
Irian Jaya	42	25.5	-	-	4.5	-	-	30	71
TOTAL	190 2/	80.1	1.5	19.6	17.7	0.8	0.3	120	63

1/ "Forest" as defined in law #5 of 1967 is any "area covered with growing trees which as a whole forms a natural biological living community with its surrounding".

2/ In the "Statistical Pocketbook of Indonesia", April 1971, the total land area according to the Directorate of Topography is 201.9 million hectares, but according to the Directorate General of Forestry the figure is 190.4 million hectares.

3/ These categories will include areas which were once forests but are now open grassland, cultivated or in some other way converted.

4/ These develop after the original forest has been destroyed by fire or shifting cultivation. Areas indicated are very rough estimates based on data contained in "Forestry Resources in Indonesia" Department of Forestry, May 1966 and Dr. J. A. von Monroy's "Forestry and Forest Industries in the First and Second Five-year Plans of Indonesia", October 1968.

5/ Comprises plantations and natural stands.

6/ Includes coniferous and hardwood plantations

Source: Several official documents and reports which due to purpose and time of publication do not agree in all respects. Main sources are the "Forestry Masterplan Summary, D.G.F., Dec. 1971 and the documents noted in footnote 4/.

Table A.37: MARINE FISHERIES PRODUCTION, BY PROVINCE, 1971

	Production		Fishing Boats		Fishermen		Production: Per Boat	Production: Per Man
	(1000 MT)	(%)	(1000)	(%)	(1000)	(%)	(MT)	(MT)
Aceh	27.5	3.4	11.3	3.9	22.6	2.5	2.44	1.22
North Sumatera	90.4	11.2	10.7	3.7	48.5	5.4	8.48	1.86
Riau	178.8	22.1	7.4	2.6	19.6	2.2	24.25	9.11
West Sumatera	14.0	1.7	4.2	1.5	13.7	1.5	3.30	1.02
Jambi	8.5	1.1	2.4	.8	4.7	.5	3.52	1.80
South Sumatera	22.9	2.8	7.5	2.6	17.8	2.0	3.03	1.28
Bengkulu	1.4	.2	1.0	.3	2.5	.3	1.45	.57
Lampung	26.6	3.3	1.5	.5	5.9	.7	18.17	4.50
Jakarta	6.3	.8	1.5	.5	5.6	.6	4.22	1.14
West Java	53.6	6.6	8.4	2.9	45.6	5.1	6.35	1.18
Central Java	30.3	3.7	10.0	3.5	40.4	4.5	3.04	.75
East Java	45.2	5.6	22.8	7.9	129.8	14.5	1.98	.35
West Kalimantan	33.6	4.2	8.9	3.1	14.6	1.6	3.76	2.31
Central Kalimantan	25.4	3.1	3.4	1.2	6.3	.7	7.44	4.05
East Kalimantan	17.0	2.1	4.3	1.5	13.3	1.5	3.94	1.28
South Kalimantan	17.1	2.1	2.5	.9	6.7	.8	6.82	2.56
North Sulawesi	16.5	2.0	30.2	10.5	45.5	5.1	.55	.36
Central Sulawesi	5.7	.7	15.1	5.3	18.8	2.1	.38	.30
South Sulawesi	97.7	12.1	39.2	13.6	171.9	19.2	2.49	.57
Southeast Sulawesi	16.0	2.0	19.6	6.8	23.4	2.6	.82	.68
Bali	2.6	.3	10.8	3.7	16.1	1.8	.24	.16
Nusa Tenggara Barat	12.5	1.5	5.5	1.9	19.8	2.2	2.25	.63
Nusa Tenggara Timor	14.1	1.7	10.2	3.5	26.1	2.9	1.39	.54
Maluku	39.1	4.8	32.9	11.4	69.0	7.7	1.19	.57
Irian Jaya	7.2	.9	16.0	5.6	105.4	11.8	.44	.07
Indonesia	810.1	100.0	287.6	100.0	893.8	100.0	2.82	.91

Source: Statistical Pocketbook of Indonesia, 1970-71, pp. 140-143.

Table A.38 PRODUCTION OF SEA AND INLAND FISHERY, 1971

Weight of Fresh Fish

	Sea Fishery (MT)	Inland Fishery (MT)	Total (MT)	Per Capita Production (kg)
Java and Madura	135,544	128,187	263,731	3.4
Sumatera	370,123	82,198	452,321	21.7
Kalimantan	93,198	160,507	253,705	49.2
Sulawesi	135,826	37,663	173,489	20.3
Bali and Nusatenggara	29,162	4,311	33,473	5.0
Maluku and Irian Jaya	46,329	3,830	50,069	24.9
Indonesia	810,092	416,696	1,226,788	10.3

Source: Statistical Pocketbook of Indonesia, 1970-71.

APPENDIX C - REVIEW OF MINERAL PRODUCTION

1. TIN. The State tin enterprise P.N. Timah, formed in 1968 and currently Indonesia's sole tin producer, is pursuing a vigorous program of rehabilitation and expansion. Production of tin concentrates increased from 12,769 MT in 1966 to 21,765 in 1972. The company is reported to be operating 36 dredgers and studying the possible acquisition of two additional ones. Three private companies involving foreign investors are cooperating with P.N. Timah in exploration: P.T. Koba, Billiton and Broken Hill. A UNDP technical assistance program launched in 1968 is involved in the search for offshore reserves, and has identified substantial additional reserves, some in waters over 135 ft. in depth, near Bangka Island, Indonesia's main tin production center. The discovery means a new lease of life for Bangka, whose reserves were rapidly becoming depleted. Under UNDP guidance P.N. Timah has also introduced new ore-dressing methods that have improved cassiterite and trace minerals recovery, leading to an estimated $6 million annual improvement in earnings. Tin mining operations are centered in Bangka Island, and immediately offshore which continues as the largest source of tin (11 connected bucket line dredgers and 72 other mines), in operation in 1971, producing about 60% of the world's total. Significant production is also derived from Belitung and Singkep Islands and lesser amounts of tin were mined on Kariman, Kundun and Bangkinang. P.N. Timah, whose predecessor company began producing mettalic tin only in 1967, smelts about half the national output of concentrates at Mentok, Bangka Island, having increased output from 5,190 MT in 1970 to 12,009 MT in 1972. Mentok output is Grade A tin, with a typical analysis reported as: Sn 99.935%, As 0.014%, Pb 0.033%, Fe 0.007%, Cu 0.006%, Sb 0.005%, Bi 0.001%. In accordance with national policy of maximizing the domestic processing of materials, the company plans to increase its smelting capacity so that Indonesian mine output may be exported entirely as tin metal. It is reported that three new furnaces are to be added in the near future. Indonesia is one of seven producing members of the International Tin Council (ITC). The ITC decision effective in January to impose export controls limiting sales to the 1972 level was not to Indonesia's liking, since the national development program calls for continuing the expansion of the tin industry. 1/

2. NICKEL. Reported ore output leveled off in 1972 after increasing by about 50% in 1971. Ore exports (to Japan) earned $11.6 million, as compared with $10 million the year before. The state-owned enterprise P.T. Aneka Tambang is now Indonesia's sole nickel producer, from its Pomalaa mine near Kendari in South Sulawesi. With the prospective depletion of exportable grade ores from this source (2.2% Ni), the Indonesians agreed with the Japanese Government in February, 1973, on the utilization of Y10 billion (approximately $32.4 million) in Japanese assistance loans for a smelter to process low-grade ore into ferro-nickel. This plant is now under construction by Aneka Tambang, and is to be completed in early 1975.

1/ Tin output for 1973 is estimated at 22.700 Tons (see "The Indonesian Economy", IBRD Report No. 286 Ind.

The projected capacity of the plant is 20,000 MT of ferro-nickel (4,000 tons of nickel content) annually, committed under a long-term sales contract to SUNIDECO, representing a group of Japanese smelters. Low-grade ore reserves are estimated to be sufficient for about 100 years' exploitation at the planned level of output. The major new spur to future growth of Indonesian output is expected to come from foreign investment projects. Two foreign companies are advancing with plans for production, one from Gag Island just west of Irian Jaya, and another from near Malili in south-central Sulawesi. A third continues exploration in the Northern Malukus. Realization of already announced foreign investment projects, if the full 130 million lbs. (metal content) of annual production projected is achieved, would increase Indonesia's present output of nickel more than sevenfold after 1977.

3. COPPER. Indonesia became a copper exporter in December 1972 with the initial shipment of concentrates from the Freeport Indonesia mine in Irian Jaya. Annual exports should increase to about 225,000 tons with a gross value of about $60-$80 million. 1/

4. BAUXITE. Indonesian bauxite production has grown steadily over the last twenty years with production reaching 1.3 million MT in 1972. The high-grade ore at Bintan Island just southeast of Singapore, the principal bauxite-producing district of Indonesia, is becoming depleted, although ample reserves of low-grade bauxite remain at that site. Reportedly, a survey has concluded that these deposits would justify a 250,000 ton-per-year alumina plant there. A joint venture involving Japanese interests is under consideration for the $100 million project. Plans for a $1 billion electrolytic aluminum reduction plant and hydropower facility at Asahan in North Sumatera to produce 220,000 tons yearly of primary aluminum was once proposed. To date the foreign partnership of five Japanese companies (under Sumitomo leadership) along with Kaiser and Alcoa from the U.S., has not produced a financing package acceptable to the Indonesian Government. The Swiss firm Electrowatt has been chosen as GOI consultant on the project.

5. IRON. In the first two years of production the Aneka Tambang's iron sands project at Cilacap has not achieved its targeted output of 300,000 tons annually, falling short by 30,000 in 1971 and 34,000 in 1972. The shortfall has been attributed to the uneven quality of the sands, necessitating unanticipated processing before shipment to achieve the mineral content specified in the ten-year sales contract with Nippon Kokau Kabushiki Kaisha. It is reported that the project will be further developed to exploit the iron reserves of the Jogjakarta area, estimated at 15 million tons, of which about 12 million are recoverable with current technology. Since iron sand exports (estimated average of 39% FE content) earn only

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1/ This industry is subject to full tax holidays and other incentives which indicate that government receipts from this operation will be minimal for the next 10 years.

$5.00 per ton, investigations are being carried out as to the economic feasibility and technical options for processing this ore into pellets to improve earnings. It is reported further that West German technical experts of the Salzgiter Group are to investigate the possibility of exploiting iron sand and titanium deposits on the southern coast of West Java. Iron and steel production in Indonesia is undergoing considerable expansion. It is reported that of Indonesia's 600,000-ton annual consumption of iron and steel, only 70,000 tons were produced domestically in 1972. Steel production is projected at 100,000 tons in 1973, and at 3.6 million tons in 1985. A number of new iron and steel ventures, notably the Government-owned, PERTAMINA-financed integrated mill P.T. Krakatau Steel, are in various stages of development, but as yet it has not been determined whether the processing of domestic ores will become practical as the Indonesian industry undergoes integration and expansion.

6. MANGANESE. Preliminary 1972 data show a relatively large drop in Indonesia's manganese production -- from 11,958 MT in 1971 to 7,538. According to Mining Ministry officials, these figures are "incomplete" -- and indeed it is difficult to reconcile them with other reports about activity in the small Javanese mines that are the source of this output, to say nothing of the reported 107.6% increase in 1972 export receipts from this resource. The West Java provincial administration, through its mining corporation P.D. Pertambangan Jabar, controls about 34 small mines south of Tasikmalaya in the Karnanunggal district. Shipment from Cilacap reportedly takes place three times a year (which might explain considerable year-to-year variations in export figures). Reports suggest that production is expanding and state that new methods are being introduced into these mines in a technical assistance effort of the ITB (Bandung Technical Institute) in cooperation with LIPI (the Indonesian Academy of Sciences) and aided by the Japanese. Mines run jointly by the Jogjakarta administration and P.T. Wono at Kiripan and Punggang are being modernized, and will operate from early next year with daily production of 200 tons on reserves estimated at 600,000 tons of manganese. The revival of manganese mining on Doi Island in the North Maluku regency is reported under consideration by the local administration despite unfavorable conclusions reached previously as a result of a survey by Aneka Tambang. The new evaluation identified reserves of about 700,000 tons of manganese in areas of varying quality, permitting exploitation at a rate of 30,000 tons a year (possibly by labor-intensive methods that would be impractical for Aneka Tambang).

7. GOLD AND SILVER. Recorded gold production increased slightly in 1972 (339 kg., as against 329 in 1971), while silver production fell back. The two metals occur together at Cikotok, southern Banten (West Java), in a mine operated by Aneka Tambang. These deposits are becoming depleted and the Company has embarked on a vigorous survey program in areas north of Cirotan, west of the existing mine, with a view to reviving production. In June 1971, the Company closed its mine in Bangkinang, near Pekanbaru, Central Sumatera. Gold production, on an artisanal basis takes place in several districts in East Kalimantan, and in several in East Sumatera, but this production is not recorded. The west coast of Aceh, in northern

Sumatera is also considered to have promise for commercial exploitation. The Indonesian demand for gold considerably exceeds domestic production. Indonesian prices generally lag behind world market trends but remain above them. Aneka Tambang gold sold at auction for Rps. 589 (approximately $1.41) per gram in January 1972; Rps. 857 ($2.07) per gram in December 1972, Rps. 1,077 ($2.60) in March 1973, and Rps. 1,800 ($4.34) per gram at the end of July 1973. It seems reasonable to expect price developments to have a stimulating effect on production, especially from small mine operators.

8. URANIUM. Contracts of Work permitting general minerals work in the territory of Indonesia typically do not grant rights for uranium exploration and exploitation. The only entity exercising such rights at present is BATAN, the national atomic energy authority. BATAN has been surveying 250,000 hectares in Central and East Kalimantan for the past three years in cooperation with the French atomic energy authority. In January 1972, BATAN was assigned an additional 91,000 sq. km. in Kalimantan for investigation, but as yet has not found anything of commercial value.

9. KAOLIN. Indonesian production of kaolin in 1972 was reported to be 6,013 MT. P.T. Keramika Indonesia Asosiasi, the principal domestic consumer, obtains supplies from Bangka and Beliting islands. Clay mined at Togaret in Sulawesi, by P.T. Usis in partnership with Kanematsu Cosho, Ltd., is exported to Japan from the port of Bitung.

10. ASPHALT. Rock asphalt production fell back in 1972 from its 1971 peak--from 143,000 MT to 115,000. According to reports, asphalt production must increase to 360,000 tons annually to meet its share of national demand. There is a projected demand of 600,000 tons annually for the national road construction program. Existing demand is met by the State Asphalt Company (P.N. Aspal), a small refinery at Wonokromo, East Java, and an asphalt plant near PERTAMINA's Plaju refinery in South Sumatera.

11. COAL. It was reported late in 1972 that P.N. Batubara, the state coal mining concern, was nearing collapse with three of its mining units -- Qmbilin, Bukit Asam and Mahakam -- virtually idle. Against uncertain market prospects, the Indonesian Government now faces the question whether to keep is mines open -- at a heavy cost in Government subsidies and considerable investment in modernization -- to close them. Last October, the Minister of Mining established a steering committee to conduct feasibility studies on the rehabilitation of the Asam mine with financial assistance from the Asian Development Bank, and similar measures are to be undertaken at Qmbilin. It has been reported that the three foreign companies, Shell, Marubeni and Mobil, have expressed an interest in participating in the revival of these mines. Indonesian coal mining continues to be plagued by stagnant demand (domestic consumption in 1971 and 1972 was recorded as 195,606 MT and 190,742, respectively). In step with the rapid growth of the domestic petroleum industry domestic users have turned to plentiful and convenient petroleum products for their energy needs. But petroleum prices are on an increasing curve because of the prices that Indonesian petroleum commands on the international market. Currently, the Indonesian power authority

burns diesel fuel at $0.46-1.03 per million BTU while Indonesian coal at $0.27-53 per million BTU finds few takers. 1/ An energy policy statement by IR. Wijarso, Director of the Office of Oil and Gas, April 30, 1973, called for a revival in the use of coal to conserve Indonesian petroleum for export, and for consideration of a transport subsidy to render the use of coal more attractive. While such a new policy direction cannot be expected to revive the demand for coal overnight, together with the changing energy cost picture, it does point the way toward an improvement of coal industry prospects.

12. DIAMONDS. The principal known deposits of diamonds in Indonesia are in Kalimantan, at Samarinda in the east, Martapura in the south, Landak in the west and Barito-Purutjao, Central Kalimantan. There are recent reports that previously unknown deposits of commercial promise have been identified in Matapura. Diamonds are produced by panners in the traditional sector of the industry; P.N. Aneka Tambang also has a diamond-mining operation in Kalimantan along with two other domestic companies, Firma Antang and C.V. Niut. The Indonesia-Bruneian joint venture P.T. Asia Togor has a contract to explore for diamonds in the south of the island, but is apparently not pursuing its program actively.

1/ The recent large increase in the world price of oil is likely to alter this position.

APPENDIX D - HIGHWAY NEEDS ON JAVA

1. The benefit-cost calculations done by Bina Marga are rather detailed, but they are almost entirely based on user cost savings of existing traffic (and "normal" growth) on the various links and slight the more elusive and problematical calculations of development benefits and generated traffic. Generally, however, it is not difficult to establish at least a prima facie case for a major highway program on Java. Table A.33, taken from an unpublished IBRD mission report, gives estimates of intercity traffic over a large number of links for 1971. This table greatly understates the traffic density near the major towns, since "urban and suburban traffic was excluded by taking the lowest density section as a measure of the total traffic between the specified cities".

2. The next step in estimating capacity requirements is to convert the total vehicles per day to "transport units" per day. The Asian Highway Transport Technical Bureau used the coefficients given in Appendix A, Table 34 in its analysis of links of the Asian Highway. One does not have to perform detailed calculations with these coefficients and the data in Appendix, Table A.33 to realize that even on the least travelled sections of most of the links listed in Appendix Table A.33, daily traffic in 1971 amounted to more than 1,500 transport units per day. For traffic of this density another ECAFE technical bureau recommends 1/, as a minimum standard a four-lane cement or asphalt concrete road. Most of these links, including many on the outskirts of Jakarta and the other major cities with average daily traffic amounting to several thousand transport units, at present are only two-lane bituminous roads. This class of highway, according to the same Summary, is suitable for volumes of only 75 to 300 transport units per day, and the result is frequent congestion, very slow speeds, high vehicle operating costs, and, in all probability, uneconomically high maintenance costs.

3. This problem is, of course, recognized by Bina Marga. When queried as to the first and second priorities for highway investment in the entire country, the Chief Engineer of Bina Marga pointed immediately to the Jakarta-Cikampek and Surabaya-Malang links, which aside from the Jakarta-Bogor highway project currently in progress, carry the greatest total traffic and the greatest truck traffic on Java (See Appendix Table A.33). The Chief Engineer's plan for these links is to build shorter limited-access links, starting from the two major cities and connecting the major towns enroute, retaining the present alignments for short haul feeder traffic. This phased construction plan is partly a response to the decision of USAID not to finance a highway program on Java, despite previous financing of a detailed feasibility study for a Trans-Java Highway. The

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1/ See Summary of Suggested Minimum Geometrical Standards for Asian Highways, with the exact reference, in Kobe, op. cit., p. 145.

AID decision not to finance the Trans-Java Highway, according to discussions with the Director and most of the AID staff in Jakarta, was not based on any misgivings about the economic justification of highways on Java, but rather on the congressionally-mandated reordering of its agricultural, rural development and social welfare activities. The IBRD has yet to finance the construction of highways on Java.