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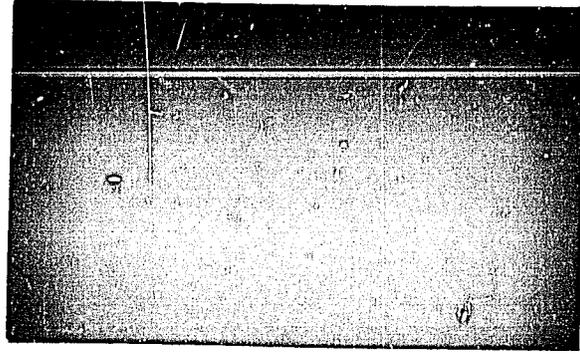
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THE PALEMBANG PORT  
AND SHIPPING STUDY  
VOLUME I  
ECONOMIC BASE SURVEY

## 1.0 ECONOMIC BASE SURVEY

### 1.1 Palembang Port Hinterland Studies

#### 1.1.1 Introduction

Port hinterland studies comprise the first of three sections concerned with cargo projections for the Port of Palembang. The purpose of this chapter is to define the geographic area dependent on port facilities and on which the port depends for its cargo movements. Based on the findings of port hinterland studies, Section I-1.2, Hinterland Studies, examines the development of hinterland. Section I-1.3, Port Cargo Trends, reviews the historic developments in seaborne commerce. Port cargo studies and forecast presented in Section I-1.4 utilize the findings of previous sections, along with commodity information to prepare the port cargo estimates for the period under review.

#### 1.1.2 Method

There are several methods currently in use to identify a port tributary area including transport cost analyses, interport comparisons, and specific commodity studies. In this study, the definition of port hinterland is based primarily on an analysis of port records to determine: (a) inland origin and destination of port cargo indicated therein and (b) relative importance of different parts of the port hinterland for total port cargo and for major commodities and commodity groups. These findings are, however, compared with the results obtained from other methods of estimating a port hinterland. The potential entrepot function of the port is also briefly examined. The chapter closes with an analysis of new developments likely to affect the existing

port hinterland during the period under review.

The analysis of Origin and Destination of Port Cargo should consider destinations of imports to be those given in the manifests as the addresses of consignees, and for exports, addresses shown on shipping orders for trucked cargo and loading points for rail or lightered cargo. In reality, the final destination and the manifested address on the import cargo do not always coincide and the same is true for much of the export cargo. For example, the major share of exports to Singapore are really transshipped via Singapore to other destinations. This also applies in the case of imported consumer goods for which the importer's location is only the first stop in a wholesale, retail and consumer network. For raw material and semi-processed imports and exports, port records reflect the actual origin and destination of cargo more accurately except for certain commodities such as those like rubber transshipped through Singapore.

## 1.2 Port Hinterland Studies

Port hinterland is an area dependent on port facilities and on which the port depends for its cargo movements. A definition and socio-economic analysis of this area are required to estimate its future needs for port facilities and to evaluate the economic feasibility of the proposed port improvements.

Several methods are currently used to identify a port tributary area, including transport network analyses, interport competition studies and inland origin and destination surveys. In this study, the definition of a port hinterland is based primarily on an analysis of inland origin and destination of port cargo. These

findings are, however, compared with results obtained from these other methods of estimating a port hinterland.

#### 1.2.1 Inland Origin and Destination of Port Cargo

The consultant made an independent investigation of inland generation of port cargo as a part of the commodity studies and forecasts. The deficiencies of the port traffic data referred to in Chapter III negated its use in determining accurately the inland origins and destinations of port cargo.

Direct information was obtained on inland origin of major export crops and on cargo movements of industrial-mining establishments using the project port. Similar data for inland distribution of staple foods unloaded in the port was available from the government marketing agencies. Indirect data on the inland origin and destination of port cargo was derived from the analysis of cargo movements through the port. To illustrate, it was found that general cargo unloaded at Pertamina's wharf was for the company's internal use and that cargo handled in the midstream usually had originated or was destined for points within port hinterland accessible by river transport.

##### 1.2.1.1 Inland Destination of Unloaded Cargo

Table I-1.2-1 lists the principal products unloaded in the project port in 1974. Detailed information on the inland distribution of rice, sugar, cotton, fertilizer, timber, rubber and flour is presented in Chapter III. Briefly, rice, sugar and flour are distributed to major population centers in the South Sumatra province. Prior to 1974, some very small volumes of staple food products were also destined for consumption in the

TABLE I - 1.2-1

PRINCIPAL PRODUCTS UNLOADED IN PALEMBANG IN 1974.  
(000 tons)

<u>Products</u>	<u>Volume</u>
Crude and oil products	2524.5
Rice	90.9
Cement	61.9
Sugar	43.0
Salt	18.7
Coconut and oil	16.7
Flour	13.8
Logs and timber (000 m <sup>3</sup> )	8.0
Fertilizer	5.0
Cotton	3.4
Rubber	1.9
Other	182.0
<b>Total*</b>	<b>2961.9</b>

\* Excluding Logs & Timber

TABLE I - 1.2-2

PRINCIPAL PRODUCTS LOADED IN PALEMBANG IN 1974  
(000 tons)

<u>Products</u>	<u>Volume</u>
Oil Products	1461.3
Logs (000 m <sup>3</sup> )	618.8
Fertilizer	173.5
Rubber	149.0
Coffee	41.0
Coal	74.0
Sawn Timber (000 m <sup>3</sup> )	26.4
Plywood	3.0
Other	36.6
	<hr/>
Total*	4893.4

Excluding Logs & Sawn Timber

nearby Bengkulu province. Cotton, fertilizer, timber and rubber unloaded in the port are destined for industrial plants located in the Palembang area. Substantial portions of imported cement are used for expansion of the PUSRI fertilizer plant and for the residential and commercial construction in Palembang.

Virtually all general cargoes, including salt and coconut oil, are initially destined to importers and wholesale distributors in Palembang. Most general cargo is consumed in the Palembang area, according to the provincial Trade Department spokesman, government marketing agencies and shipping line and forwarding firm representatives. A substantial part of this cargo is food supply, spare parts and other goods unloaded at Pertamina wharves for the internal use of refinery employees and operations. Some food products and consumer goods are distributed throughout the South Sumatra province. Only a small volume is transshipped to the nearby Bangka and Belitung islands and the coastal zones.

#### 1.2.1.2 Inland Origin of Loaded Cargo

Principal commodities loaded in the port of Palembang are shown in Table I-1.2-2. Inland origins of rubber exports are scattered throughout the South Sumatra province as shown in Section 1.4, Figure I-1.4-3. Coffee growing areas shown in Section 1.4, Figure I-1.4-4 are limited to the southern highlands of South Sumatra and adjacent Bengkulu province. Coal shipments originate in the Muar Enim area of South Sumatra and oil products are shipped from the Palembang's two refineries. PUSRI fertilizer plant in Palembang is the source of fertilizer shipments and some related products (oxygen,

ammonia, etc.) listed as "other" cargo. Sawn timber is shipped from a score of saw mills dotting the Musri river banks in the Palembang area while plywood is produced in a new plant located 25 km. downstream from the city. Figure I-1.4-5 shows commercial forest reserves and major logging areas supplying logs for exports through the Palembang customs district.

General cargo is a residual category including among others, scrap iron, rubber tires, salted fish, shrimp, tea, bamboo, sesame seeds, etc. For the most part, general cargo loaded in the port originates in the Palembang area, but some commodities are brought by boat from rural parts of the South Sumatra province.

#### 1.2.2 Interport Competition

The island of Sumatra is served by several major and a large number of local ports aside from the port of Palembang. The principal port in the northern part of the island is Belawan located in the North Sumatra Province some 900 km. overland from Palembang. Padang is the largest port on the West coast of Sumatra. At the southernmost end of the island, 400 km. southeast from Palembang, lies the port of Panjang. Of the local ports, only Jambi, Bengkulu and Bangka Island interact with the project port. Location of Sumatra ports discussed in this section can be found in Figure I-1.4-1.

##### 1.2.2.1 North and West Sumatra Ports

Because of the lack of land transport, natural topography and long distances, the north and west Sumatra ports have distinct and separate hinterlands from that of Palembang. There is, however, important

coastal shipping between these ports and the project port. Palembang receives cement from Padang and coconut oil from Belawan and ships fertilizer to these ports. The proposed construction of the Trans-Sumatra highway, referred to below, is not expected to alter current trade patterns.<sup>1</sup>

#### 1.2.2.2 Panjang

Panjang is one of the two principal ports serving southern Sumatra. It is located in the Sunda straits separating Sumatra from Java, some 130 statute miles from Tg. Priok, Jakarta's main sea port. The Panjang port is connected with the other principal port, Palembang, some 400 km. away by road and rail transport. The berthing facilities at Panjang comprise three concrete wharves totalling 357 m. with a draft ranging from 4-6 m. DWS. Two jetties on the east and north side of the harbor with a minimum depth of 3-4 km. DWS are used for berthing local vessels. Water front storage facilities total 8,400 m<sup>2</sup> of covered space not counting 10 warehouses owned by various companies and government agencies.

A recent study recommended the improvement and expansion of Panjang port facilities to handle anticipated growth of port traffic.<sup>2</sup> The first phase of the development plan includes one interisland berth to

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<sup>1</sup>Cement shipments from Padang will cease after the Baturaja cement plant starts operations. Coconut plantations are located in the coastal zones giving preference to coastal shipping transport.

<sup>2</sup>Sir William Halcrow & Partners, Indonesian Ports Study: Panjang, Jakarta 1975.

be converted later to handle LASH barge traffic. Three additional interisland berths are to be constructed in Phase II of the port development program.

Port traffic totalled 746,000 tons in 1973, including 537,000 tons of domestic and 210,000 tons of foreign trade cargo. According to the study, "the natural hinterland of Panjang is Lampung province, although the zone of influence may extend slightly into South Sumatra and to a lesser extent Bengkulu".

#### 1.2.2.3 Jambi

Jambi is an inland port on the southern bank of the Batanghari river approximately 300 km. from Palembang. Because of severe physical limitations in the entrance channel, the river and the harbor basin in the dry season, the port can be used only by ships with 600 DWT; in the rainy season this changes to 1000 DWT. The port facilities include a concrete wharf, pontoon jetty, an oil wharf, about 1000 m<sup>2</sup> of covered storage space, plus some cargo handling equipment. The port handled 263,000 tons of cargo (mostly rubber) in 1974, excluding 614,000 tons of timber, which is loaded in nearby Muara Sabak and Ambang Luar.

Because of inadequate land transport facilities, the hinterland of the port is determined by navigable rivers in the port area. The Jambi-Muarabung road improvement now under study will substantially expand the port hinterland. On the other hand, the proposed improvement of the Jambi-Palembang road may divert potential port cargo to the superior deepwater facilities available at Palembang.

#### 1.2.2.4 Bengkulu

The port of Bengkulu located on the west coast of Sumatra handles only ships with less than 2 meters draft, i.e. less than 200 tons capacity. Larger ships occasionally visiting the port anchor outside and are served by lighters from the port. In 1972, the port handled 14,200 tons of cargo mostly to and from Padang, another port located on the west coast of Sumatra. The principal seaborne export (5,400 tons in 1974) were logs. Other export commodities from the Bengkulu province are sent overland to Palembang and Panjang.

The port has serious problems with the high rate of sand deposits in the harbor basin and with the siltation of the entrance channel. There are no mechanical cargo handling equipment and ship bunkering facilities in the port.

#### 1.2.2.5 Bangka

Lighterage port located at Numtok serves the Bangka Island. Principal port cargo includes coal and tin ingot and pepper exports. A new quay is presently under construction on Sungai Selan to handle local and interisland passenger and cargo movements. Palembang handles some cargo transshipments destined for Bangka Island. No significant changes in the trading patterns between Palembang and Bangka Island are expected in the foreseeable future.

### 1.2.3 Transport Network Analysis

#### 1.2.3.1 Roads

Road transport in Sumatra remains compartmentalized into largely isolated provincial road systems. This

situation has been brought about in part by long distance between the major population and economic activity centers and in part by the nonavailability of inter-provincial land transport. Most major roads are still unpaved. Many paved roads are passable only with great difficulty either because of deteriorated pavement or bridge washouts.

#### 1.2.3.1.1 Trans-Sumatra Highway

Presently under construction or in advanced planning stages are various sections of the Trans-Sumatra Highway, traversing the entire length of the island. The Trans-Sumatra road sections located within the project area were studied recently by foreign consultants. According to this study, no diversion of cargo from the port of Palembang is expected.<sup>1</sup>

#### 1.2.3.1.2 Jambi-Palembang Road

The proposed improvement of the provincial road between Jambi and Palembang to all-season standards would result in substantial savings in transport distance and time. Physical limitations and high costs of cargo movements through the port of Jambi indicate that the port of Palembang could handle some cargo (notably rubber) now moved via the port of Jambi. It is also believed that the development of Jambi's large agricultural and

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<sup>1</sup>ENEX, Lubuklinggau - Telukbetung Highway Feasibility Study, Jakarta, June 1973.

The proposed improvement of the Lubuklinggau-Telukbetung section of the Trans-Sumatra Highway provides for an improved sealed road over the full distance of 590 kms. Within the port hinterland only minimal improvements involving construction of a 4.5 m. wide pavement to top of the existing road have been recommended.

forestry potential could be accelerated if dependable road access was provided to a deep water port at Palembang.

#### 1.2.3.1.3 Rail Transport

The South Sumatra railway network is shown schematically on Figure I-1.2-1 including the distances between individual rail sections. The railway presently connects major population and production centers in the South Sumatra and Lampung provinces with the region's two principal ports at Palembang and Panjang.<sup>1</sup> The equidistant point between the two ports is approximately 5 kms. northwest of the rail station of Martapura on the South Sumatra-Lampung border.

Since the variable rail transport costs tend to be proportional to the distances travelled, the rail transport-based port hinterland boundary would be determined by equal distances between the two ports.

#### 1.2.3.1.4 Java-Sumatra Cargo Movements

The analysis of Palembang port hinterland would not be complete without the consideration of intermodal competition for Java-Sumatra cargo traffic. The two basic alternatives available to interisland shippers include sea-intensive and land-intensive cargo transport. Each alternative has in turn two subchoices: for sea traffic it is the choice between sail ships and motor vessels and for the land-intensive transport between rail-

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<sup>1</sup>The Bengkulu province has only one small station (Talang Padang) attached to the South Sumatra railway. A detailed description of the rail transport system is found elsewhere in this study.

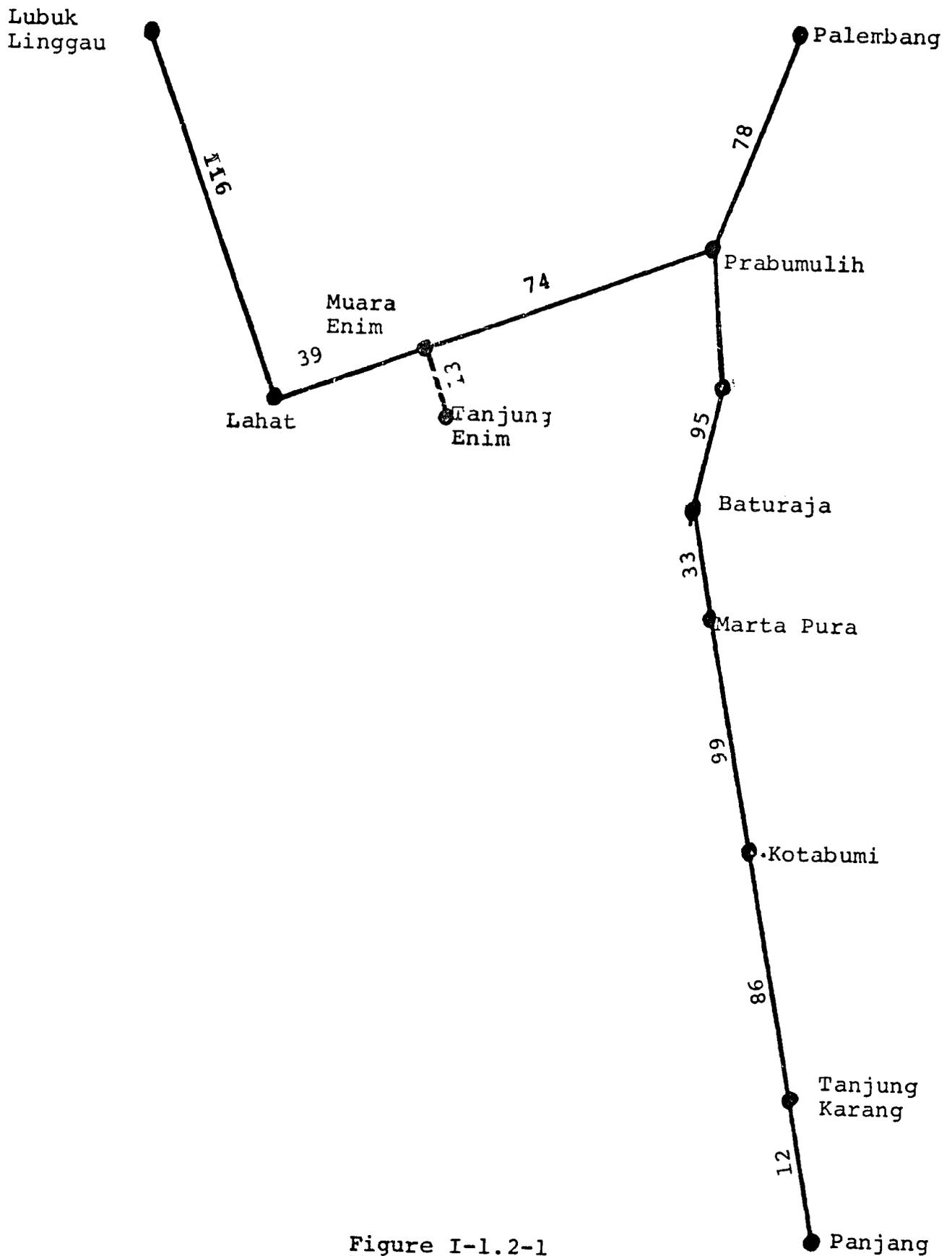


Figure I-1.2-1  
South Sumatra Railway Network  
 (Distances in Kms)  
 Not To Scale

ferry-rail transport and road-ferry-road transport.<sup>1</sup>

An analysis of the transport costs for land-intensive transport modes indicates that both the rail and road alternatives result in much higher total transport costs between Jakarta and Palembang than the coastal sea transport. Even for the new roll-on/roll-off ferry, total interisland transport costs will be too prohibitive to compete with sea transport through the port of Palembang.

This finding, however, is difficult to reconcile with the fact of a substantial and growing interisland ferry transport. Other studies examining this anomaly concluded that the demand for "land-intensive" cargo transport between Java and the project area is due in a large part to non-economic factors distorting the coastal shipping system. A principal problem is created by the so called "invisible payments" for unnecessary or fictitious port services which often amount to over 100% of the published freight rates in the major Indonesian ports, particularly Tanjung Priok, serving the Jakarta metropolitan area.<sup>2</sup> These distortions help also explain

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<sup>1</sup>A new roll-on/roll-off ferry, providing regular service between West Java and Southern Sumatra replaced old ferry transport in June 1975. The new ferry has the transport capacity of 500 passengers, 13 trucks and 4 cars and makes the 25 kms. long Sunda straits crossing within one hour. The ferry service links the Trans-Sumatra Highway with the road network of Java.

<sup>2</sup>NEDECO as quoted in World Bank's A Framework for Regional Planning In Indonesia, Washington, D.C. 1974. An indication of the extent of price distortion through invisible payments is the fact that rice is shipped from Jakarta to Palembang by rail and ferry although published rail tariffs are 133% higher than published sea tariffs.

the existence of sailing ships which do not require modern port facilities.

Since this situation has existed for quite some time, its effects are probably fully reflected in the Palembang port traffic volume. Accordingly, no special provision for port cargo diversion due to these reasons will be made in this study. On the other hand, any success that the government may have in curbing these port practices, should strengthen the demand for inter-island water transport.

#### 1.2.4 Port Hinterland - Summary

Palembang's natural port hinterland is the South Sumatra province as shown in Figure I-1.2-2.<sup>1</sup> The port provides the only deepwater facility for handling seaborne commerce within this province. Because of its inland location on the Musi river, the port is readily accessible to virtually all parts of the province by river. The port is also linked with its hinterland by road and rail transport.

Aside from the South Sumatra's commerce, the port of Palembang handles some cargo for the province of Bengkulu. However, the seaborne commerce generated in the Bengkulu province utilizes, for the most part, its own port of Bengkulu and also receives and ships cargo through the port of Panjang.

An analysis of transport sector projects in southern Sumatra leads to these tentative conclusions:

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<sup>1</sup>If the port's transshipment function is considered, the hinterland region for some types of seaborne commerce will also include the nearby islands of Bangka and Belitung and, to a much smaller degree, the local ports serving Jambi and Riau provinces.



(a) the proposed improvements of the port of Panjang will have no adverse effect on the project port, but the recently inaugurated RORO ferry service between West Java and southern Sumatra may divert from Palembang an insignificant volume of domestic general cargo shipments destined for the Matapura-Buturaja area; (b) the construction of bulk cargo deepwater port in the Sunda straits for coal exports will divert some, again relatively small interisland coal shipments from the project port; (c) the construction of the Trans-Sumatra Highway is not expected to have any perceptible positive or negative effects on the project port; (d) the improvement of Jambi-Palembang road and the construction of an interriver canal in the now isolated OKI Kabupaten would expand the hinterland of the project port and stimulate economic development of the new tributary areas.

#### 1.2.5 Economic Base Studies

##### 1.2.5.1 Area

The project area is located in the southern part of the island of Sumatra, the second largest land mass of the Indonesian archipelago. The area is separated from the West coast of Sumatra by a mountain range which levels out to broad expanses of lowlands gradually changing into marshes and swamps as they approach the straits of Malacca and the Java Sea. Included in the project area are two offshore islands of Bangka and Belitung.

The climate is tropical, characterized by heavy rainfall, high temperature and humidity and only slight seasonal variations. The heavy precipitation has a leaching effect on the area's soils explaining their

generally poor quality. By contrast, the area possesses vast mineral resources including oil, coal, tin, bauxite, copper, gold, silver, manganese and other ores. Non-mineral resources include kaoline, quartz sand, feldspar, sulphur, limestone, etc.

The project area covers over 11 million hectares. Only 12% of the total is used for agriculture, the rest is under primary forest or available for agricultural development. The land use breakdown is shown in Table I-1.2-3. Location of principal areas for potential agricultural development are shown in Figure I-1.2-3.

#### 1.2.5.2 Population

##### 1.2.5.2.1 Present Situation

The basis of population data and projections used in this study is the 1971 population census. Soon after its publication, the census has been severely criticized for errors and omissions.<sup>1</sup> These generally well founded criticisms were reviewed but found insensitive to the purpose of this study.

Total population of South Sumatra was estimated at 3.6 million in 1973. Only 27% of the total lived in urban areas including 616,000 in the city of Palembang. The geographical distribution and density of the population throughout the province are shown in Table I-1.2-4. The population density is lowest in the coastal swamp-land regions of OKI and Banyuasin and large forest areas along the Jambi province border. The ethnic composition of the population is reportedly heterogeneous with transmigration adding to the diversification.

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<sup>1</sup>RRNA, Sumatra Regional Planning Study Part B, Jakarta, May 1975.

Table I-1.2-3  
Land Use in South Sumatra

<u>Land Use</u>	<u>Hectares</u>	<u>%</u>
Forest	5,964,000	54
Agriculture	1,340,000	12
Agricultural Land Reserve	3,589,600	32
Other (urban, waste and water)	223,400	2
Total	11,117,000	100

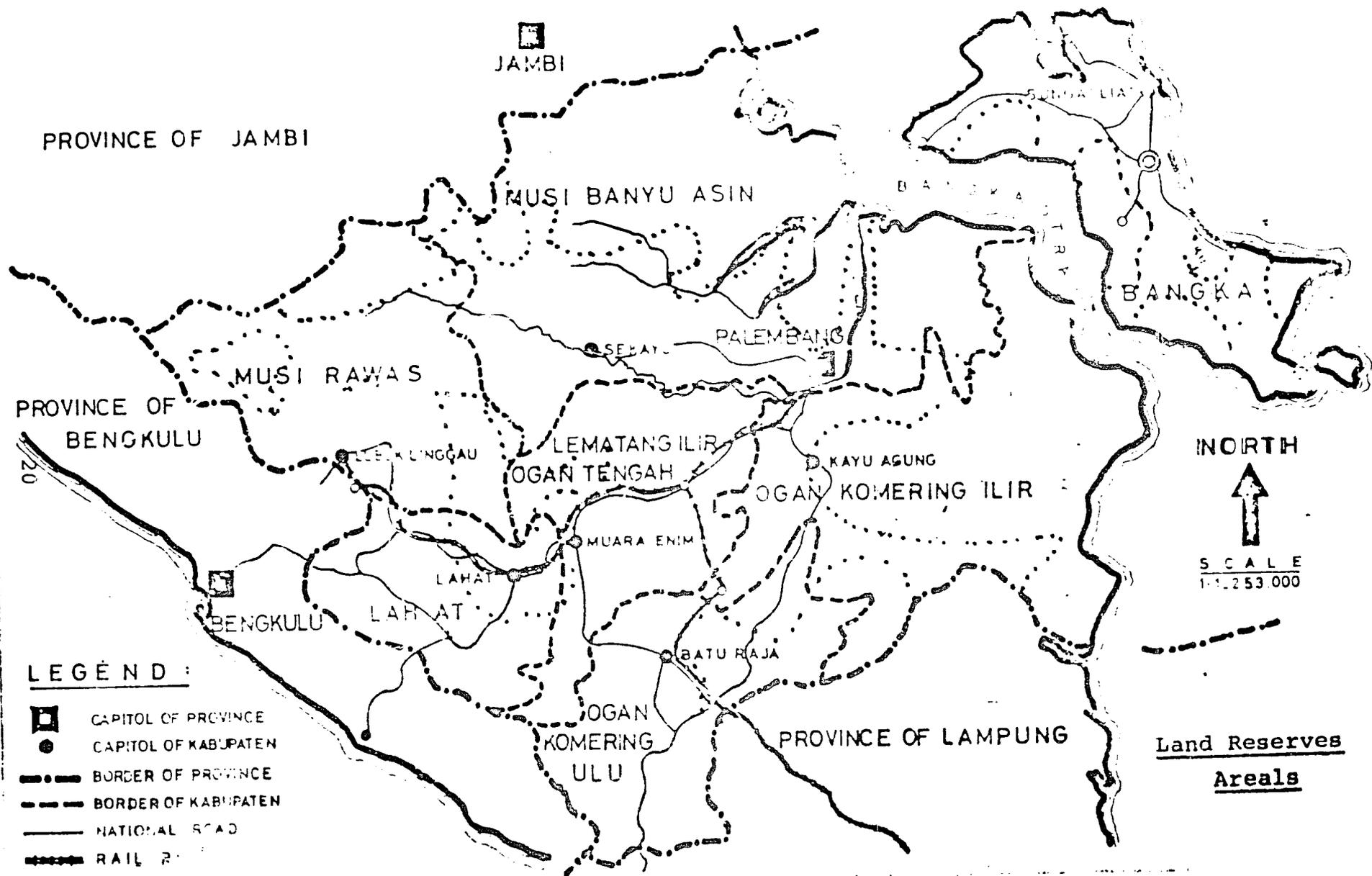


Figure I-1.2-3

SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

Table I-1.2-4  
South Sumatra Population in 1973  
 (Thousand)

Region	Inhabitants Per Km <sup>2</sup>	Population
Palembang	n.a.	616.1
Banyuasin	12	405.9
O.K.I.	22	455.5
O.K.U.	52	543.1
Liot	43	370.2
Lahat	96	391.5
Musi Rawas	12	296.0
Bangka	33	330.4
Pinang	n.a.	76.8
Belitung	29	133.8
South Sumatra	27	3,620.3

Provincial population growth estimates vary depending on the sources and definitions. According to official statistics, South Sumatra's population grew at an average annual rate of 2.2% in the 1961-71 period.<sup>1</sup> The urban population of Palembang increased by only 2.1% annually during that period.

#### 1.2.5.3 Transmigration

Transmigration is the Government policy of a geographically balanced population distribution in Indonesia. It requires the relocation of families from the densely populated areas of Java and Bali to other parts of the country including South Sumatra.

Gross migration to South Sumatra in the five year period ending mid-1974 totalled 44,000 persons of whom one-half settled in an already relatively densely populated OKU region. (See Table I-1.2-5) Of the 3,000 settler families targeted for South Sumatra in 1974/75 only 500 or 16.7% were actually settled. In the most recent period there has been reportedly a net outflow of migrants from the project area.<sup>2</sup>

#### 1.2.5.4 Population Projections

Official population projections for the project area indicate an average annual growth of 2.2% during the 1971-81 period. This estimate is questioned by recent studies, which assume higher natural growth

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<sup>1</sup>Although the Central Bureau of Statistics is not clear on this point, the indicated growth refers to natural increase only and does not include migration.

<sup>2</sup>An estimated 57,700 persons migrated from South Sumatra to Jakarta area during 1961-1971.

Table I-1.2-5

Transmigration to South Sumatra 1964-1974

Year	Area of Settlement			Total
	O.K.U.	Musi Rawa	Banyuasin	
1969/70	223	273	--	496
71	1,689	1,653	2,522	5,264
72	2,809	--	2,514	5,323
73	11,805	2,851	2,910	17,566
74	5,031	2,353	7,961	15,345
	21,557	7,130	15,907	43,994

Source: Sumslera Selstan Dalam Angka Tahun 1973

recent studies, which assume higher natural growth rates.<sup>1</sup> The problem of estimating the area's future population is further complicated by indecisive trends of the Government's transmigration policies.

For the purpose of this study, the average annual growth rate, including migration to the area, has been assumed at 2.5% p.a. through 1980 and at a gradually declining rate thereafter as shown in Table

According to the 1971 census, the economically active population in the project area totaled 1.2 million people. The agricultural sector provided employment to 70% of the total. Less than 4% were employed by the industrial establishments, as shown in Table I-1.2-6. Labor force is expected to grow slower than the population as a whole because of the increased availability of educational facilities.

#### 1.2.6 Economy

##### 1.2.6.1 Indonesia

Economic development of Indonesia since the New Order of 1966 has been impressive as evidenced by aggregate indicators of economic growth. (Table I-1.2-7) The runaway inflation was slowed down, foreign debts rescheduled and exchange reserves replenished. The Government moved quickly to stimulate foreign investment needed to finance Indonesia's economic growth.

The first development plan - Repelita I - ended in 1974 gave priorities to agriculture and the develop-

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<sup>1</sup>"Expert Pessimistic Over Reduction of Fertility Rate", The Indonesia Times, October 9, 1975.

Table I-1.2-6

Population Projections for South Sumatra

<u>Year</u>	<u>Population</u>	<u>Annual Growth Rate</u>
1971	3,479	2.5
1980	4,344	2.4
1985	4,891	2.3
1990	5,478	2.2
1995	6,107	2.1
2000	6,776	

Table I-1.2-7  
GDP Growth in Indonesia by Sector  
 (Constant 1960 Rupiahs in Billions)

Sector	1966	1973	Annual Growth Rate
Agriculture, Forestry, Fisheries	236.1	303.4	3.7
Mining and Quarrying	15.4	49.8	18.1
Manufacturing	36.3	63.3	8.2
Construction	8.4	26.4	17.8
Utilities	1.7	4.0	13.0
Transport and Comm.	15.2	27.3	8.8
Trade	64.5	137.7	11.1
Financial	3.4	14.7	23.1
Public and Defense	24.3	34.0	4.9
Other	36.6	46.6	3.5
TOTAL	441.9	707.2	7.0

ment of the country's exchange-earning natural resources. In Repelita II (1974-79), the emphasis is on the creation of employment opportunities, increasing living standards and a more balanced regional development. Because of Indonesia's higher oil revenues, the pace of development during Repelita II has been substantially accelerated, with the government raising the economic growth targets from 7.5% to 9.0% annually.<sup>1</sup>

Over the longer term, Indonesia's potential for productive investment, employment and income growth is encouraging. In agriculture, the development of new areas, expansion of ongoing programs in irrigation, introduction of high yielding crop varieties, improvement of agricultural extension services, provision of credit, farm inputs, etc. promises to yield high results. The industrial potential buoyed by large and growing domestic demand is good, both for resource-based activities and for labor-intensive light industries. There is also a serious backlog of physical and social infrastructure in many parts of the country.

Recognizing these problems and opportunities, the government is striving to realize Indonesia's potential and increase living standards. Assuming the continuation of these efforts and favorable international economic relations, the World Bank anticipates the doubling of per capita consumption during the 1970-1985 period.

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<sup>1</sup> However, as a result of recent economic and financial problems, the Government is now reviewing major project priorities and slowing down implementation of certain major projects.

#### 1.2.6.2 South Sumatra

Economic activity in South Sumatra is still dominated by agriculture although less so than for the country as a whole. This is due largely to the importance of mining activities, particularly in the oil sector.

Besides the oil industry, other growth industries in the province were construction and services. Agriculture and forestry showed little change during the 1968-1972 period, but there has been a rapid growth in log production and exports since then.

In recent years, the overall economic growth in the province trailed the national average. The lag in new investments in the productive facilities slowed down between 1968 and 1972, compared with 7.1% for the country as a whole. Despite its slower growth, the economic wellbeing in the province is measured in per capita GDP (excluding oil) is at Ps. 44,269 in 1972, well above the national average of Ps. 33,467.<sup>1</sup> (Tables I-1.2-8 and I-1.2-9)

#### 1.2.6.3 Agriculture and Forestry

##### 1.2.6.3.1 Present Situation

The project area's economy is based on agriculture which employs 70% of the economically active population and contributes 39% to the provincial domestic product. The most important commodities of South Sumatra are rice, rubber, timber, coffee, spices (pepper and cloves) and cassava. The production of

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<sup>1</sup>Hendra Esmara, "Regional Income Disparities" in Bulletin of Indonesian Economic Studies, March 1975.

Table I-1.2-8  
Economically Active Population of South Sumatra  
in 1974

Activity	Persons	%
Agriculture	849,640	69.3
Mining	26,101	2.1
Manufacturing	42,591	3.4
Utilities	767	.1
Construction	23,239	1.9
Trade and Commerce	96,427	7.9
Transport, Storage and Comm.	30,296	2.5
Financing and Insurance	2,179	.2
Community Services	91,039	7.4
Other	<u>63,685</u>	<u>5.2</u>
TOTAL	1,225,964	100.0

Table I-1.2-9  
Economic Activity Indicators in South Sumatra

Sector	% of GDP in 1972	Average Annual Growth 1968-72	Employment %
Agriculture, Forestry and Fisheries	39.3	1.3	71.5
Mining and Quarrying	16.8	9.0	2.2
Manufacturing	6.1	5.5	3.7
Construction	3.5	10.2	1.9
Utilities	0.3	6.2	0.1
Transportation, Communication and Storage	7.0	6.2	2.6
All Other Sectors	<u>27.0</u>	<u>7.5</u>	<u>18.0</u>
TOTAL	100.0	5.0	100.0

these commodities in different parts of the project area is shown in Table I-1.2-10.

Upland cultivation dominates the agricultural activity in the project area. Only rice is grown in the eastern coastal lowlands. Extensive rubber plantations and rice paddies are found in the northwestern part of the province while coffee grows in the southwestern mountain region. Rubber and spices (pepper and cloves) are the principal cash crops grown on the Bangka Island. The project area is deficient in major staple food products including rice and sugar.

South Sumatra is an important and growing source of forest production in Indonesia. Since its productive resource base of 2.9 million hectares has been systematically exploited for only a few years, the long-term development potential is great. Log production in the province increased rapidly from 304,000 m<sup>3</sup> in 1971 to 943,000 in 1974, largely as a result of new liberal timber concession policies. Timber-based industries are still in their infancy but the proximity to the Jakarta area makes the project area well positioned to become a prime location for wood product, paper and related industries serving the rapidly growing domestic market.

Timber resources and individual crops are studied in more detail in Chapter III (Traffic Studies and Projections). Here it should be explained that the market areas for these crops are not always coterminous with the provincial boundaries. To illustrate, some rubber and logs exported via Palembang originate in the border regions of Jambi province while rubber and spice exports from Bangka

Table 1-1.2-10  
Production of Major Crops in South Sumatra in 1972/73  
 (Tons)

Area	Rice (Paddy)	Cassava	Rubber	Coffee	Spices	Total
Palembang	33,303	1,967	--	--	--	35,270
Banyuasin	110,240	40,306	34,257	--	680	185,483
Musi Rawas	108,411	8,418	36,238	216	1,567	154,850
Lahat	114,750	9,425	9,643	12,538	1,666	148,022
Liot	67,549	13,957	21,575	2,067	941	106,089
OKI	106,810	11,688	18,996	29	--	137,523
OKU	172,303	33,184	13,537	21,059	492	240,575
Bangka	10,327	28,572	2,500	4	18,025	59,428
Belitung	799	4,849	113	2	936	6,699
Pinang	--	890	--	--	--	890
<b>S. Sumatra Total</b>	<b>724,492</b>	<b>153,256</b>	<b>136,859</b>	<b>35,915</b>	<b>24,307</b>	<b>1,074,829</b>

Island, which is a part of South Sumatra province, are shipped directly bypassing the port of Palembang.<sup>1</sup>

#### 1.2.6.3.2 Future Prospects

The growth of agricultural production in the project area is predicated on more intensive cultivation of the existing farming areas and on the implementation of various agricultural development schemes. Both programs are briefly described and evaluated below. The effects of these programs on project port traffic are considered elsewhere in this study.

##### 1.2.6.3.2.1 Intensification Program

To increase rice production from the existing farm areas, the Government has launched a rice intensification program. Under this program, participating rice farmers obtain low cost fertilizer as well as pesticides and agricultural extension services. The current rice paddy production targets from "intensification" farms are 4.9 tons per hectare, compared with about 3 tons per hectare for nonparticipating farmers. While all farmers can take part, the program is mainly implemented where the irrigation systems are available. This helps explain a relatively low participation rate for the project area.

##### 1.2.6.3.2.2 Agricultural Development Programs

Agricultural development is a continuing process which is changing its scope, emphasis and direction in

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<sup>1</sup>Until recently, rice imports to Bengkulu Province were shipped, in part, via the port of Palembang. Bengkulu's coffee exports continue to use the project port.

response to emerging needs, preference and the availability of food and cash crops. The review of agricultural development programs and projects presented in this study is necessarily limited to those presently under consideration and/or likely to affect commodity flows through the port of Palembang.

#### 1.2.6.3.3 Pertamina Rice Estate

The government is interested in rice estate programs to overcome recurrent rice shortages in Indonesia. Pertamina, the state-owned oil company, has undertaken the establishment of one such estate in the project area.

The 20,000 ha. estate, currently being developed, is located about 28 km. southwest of Palembang.

The first phase scheduled for completion in 1978 will include 5,000 has. and is expected to yield at least 6 tons per ha. The entire project should be completed in 7 years.<sup>1</sup> The project will include the rice processing mill and storage facilities. Rice bran from this mill will be treated to extract edible oil and to produce cattle food. All marketing will be done by Pertamina and most rice is expected to be distributed for consumption in the project area.

#### 1.2.6.3.4 Tjintamanis Project

A consultant study was carried out by Nippon Koei Company in 1974 on behalf of the FAO.<sup>2</sup> The project area comprised 20,000 has. of alluvial swamp flatlands in the lower reaches of the Musi River, about 20 km. northeast

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<sup>1</sup>According to the information received by the consultant, the project will be retained, but possibly delayed as a result of Pertamina's liquidity problems.

<sup>2</sup>Nippon Koei Company, Tjintamanis Agricultural Development Project, Tokyo, 1974.

of Palembang. Only 460 has. of the total area are cultivated at present. This was done by spontaneous transmigrants and local farmers. The soil is generally poor, but could be easily enriched with lime and water control and become highly productive for rice and other crops.

The study estimates that 6,431 transmigrant households could settle within the 7 years which would be required to complete civil works. When the project is in full operation, it will produce about 65,400 tons of paddy, 4,000 tons of soy beans, 4,000 tons of peanuts and considerable numbers of livestock. While technically sound, the project's IRR was estimated at submarginal 7.3%. It is believed that the project would require substantial government subsidies to produce expected results.

#### 1.2.6.3.5 Belitang Proper Irrigation Project

This project was also studied by Nippon Koei Company on behalf of the FAO.<sup>1</sup> The area covers 30,000 has. of which 20,000 are already intensively cultivated with paddy and various upland crops. Only parts of the area are irrigated. The proposed project would rehabilitate the existing irrigation system and irrigate new areas for a total of 20,600 has. The full development of the project will require 9 years and will result in additional farm output of 132,000 tons of paddy, 10,000 tons of soy beans and considerable numbers of livestock. The project was found technically sound and economically justifiable.

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<sup>1</sup> Nippon Koei Company, Belitang Proper Irrigation Project, Tokyo, 1974.

A World Bank mission is scheduled to visit Sumatra later in 1975 to appraise these and other agricultural developments projects for possible World Bank financing.

#### 1.2.6.3.6 Musi Banyuasin Area Development

Another agricultural development scheme presently under study is in the drainage and cultivation of Banyuasin swamplands. This very large and potentially rich area is sparsely populated and little cultivated at the present time. Following initial FAO-financed studies, a thorough evaluation of the area's agricultural potential is nearing completion by the Agricultural Technical Institute in Bogor, Java.

Preliminary findings indicate possible development of 165,000 has. for rice, perennial crops (coconuts, etc.) and fish ponds. It is estimated that the area could produce 4-5 tons of rice paddy per ha. using conventional agricultural methods and fertilizer. While the development programs have not been fully studied and evaluated, it appears that the area between the Sebalik and Musi rivers will be developed first.<sup>1</sup>

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<sup>1</sup>The development of the region between the Shalik and Banyuasin rivers is affected by the salt water intrusion. A preliminary assessment by the RRNA Sumatra Regional Development Study team suggests that the high costs involved in the development of eastern swamplands might make it desirable to defer development of these areas.

#### 1.2.6.4 Industry and Mining

This section provides background information for industrial and mining product studies and projections presented in Section 1.4 of this study. The discussion is limited, for the most part, to the general problems confronting the industry, but reference is also made to specific industries and mining activities.<sup>1</sup>

##### 1.2.6.4.1 Industry

South Sumatra is a home for several large scale capital-intensive industries. Included in this group are two oil refineries, fertilizer complex, textile mill and a rubber tire plant. However, a large proportion of the industrial labor force is employed by the industries concerned with processing and grading of agricultural raw materials, particularly rubber, coffee, pepper and timber. All agriculture-based industries depend on locally produced raw materials and export most of their output.

Palembang is the center of industrial activity in South Sumatra with about two-thirds of industrial permits issued by the Province. The more important establishments located there include the oil refineries, petrochemical plant, PUSRI fertilizer plant, textile and rubber tire industries, rubber processing, coffee grading, sawmills and dockyards. There is also in Palembang area a large number of small food industries producing for the local market. An overview of industrial production excluding

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<sup>1</sup>At the time of this report no information was available from RRNS's Sumatra Regional Planning study on the activities and prospects in the manufacturing and mining sectors. This discussion is based to a large extent on the University of Bonn monograph on Industry in South Sumatra Province.

petroleum products, is shown in Table I-1.2-11.

#### 1.2.6.5 Petroleum Extraction and Refining

A recent slowdown in the world demand for oil has reduced refining activities at Palembang although the domestic demand continued to grow. A related unsettling development has been the Pertamina's liquidity crisis which has resulted in curtailing transferring or postponing a variety of investment projects including some in South Sumatra.

Despite its current problems, the long-term prospects for Indonesia's oil industry remain favorable. The industry is still young and the success ratio in exploration wells is considerably above the world average. According to Pertamina, some 90% of Indonesia's prospective oil and gas areas have yet to be explored. Due to its low sulphur content, Indonesian oil is in increasing demand in pollution conscious consuming countries. The Indonesian oil boom stands also to benefit from the political uncertainties in the Middle East.

In order to make more premium low sulphur crude available for export, Indonesia plans to import increasing quantities of high sulphur crude from the Middle East. In anticipation of increased Middle Eastern oil imports plans are being made for the establishment of a deep water port and central terminal station with as much as 10 million tons of storage capacity, at Semangka Bay on the southern coast of Sumatra. This would permit vary large crude carriers, or the super-supertankers, to offload Middle East crude, which then would be transhipped in smaller tankers to refineries in Indonesia.

Table I-1.2-11  
Industrial Production in South Sumatra

Product	Measurement Unit	Year Ending June 30			
		1970	1971	1972	1973
Crumb Rubber	000 Tons	--	2	28	44
Urea	000 Tons	84	98	105	108
Textile	000 Bales	5	12	15	18
Oxygen	000 Bottles	18	12	9	30
Plywood	000 m <sup>3</sup>	81	205	222	219
Foods	000 Tons	68	60	141	124
Beverages	000 Litres	433	545	243	165

### Petrochemicals

Pertamina's first petrochemical plant, producing 20,000 tons of polypropylene annually, was inaugurated in July 1973, at Palembang. Its output is used for production of clothing fibres and bags for packaging fertilizer and rice. Also at Palembang, plans are made for the development of one of the world's largest Aromatics plants, a joint venture by Pertamina and Commonwealth Oil Refining Company. It will produce materials for synthetic fibres and plastics to use in domestic factories and for export.

### Fertilizer

The fertilizer complex at Palembang produces urea fertilizer and related byproducts for the domestic market. In existence since the early 1960s, the plant uses natural gas pipelined from a Stanvac oil field in Pendopo. The PUSRI fertilizer plant is a modern and well managed industrial establishment currently being expanded to eventually produce about 1.5 million tons of fertilizer annually.

### Textile Plant

A large thread spinning plant (Patal Palembang) was constructed with public funds in 1969, reportedly to stimulate economic development in the Palembang area. The plant uses imported cotton as raw material and ships most of its output to Java.

### Rubber Tire and Tube Plant

This relatively new facility depends on local raw materials and produces for the domestic market, predominantly in Java.

### Medium and Small Industries

Rubber processing and sawmills are the two principal types of smaller industries found in the

project area. These establishments are located throughout the province near the navigable rivers which are used to ship the output to Palembang. Whereas most processed rubber is exported, sawn timber is shipped to the Jakarta area. A recently opened plywood factory located downstream from Palembang can produce export-quality plywood panels.

According to a recent survey, 34 rubber factories were registered in South Sumatra in 1973, but only 27 were operating. Of the total, 17 factories with 75% of total capacity were located within the municipal area of Palembang. No similar information is available for the sawmill industry but it is reportedly much more decentralized.

#### Mining

The province of Southern Sumatra is rich in mineral deposits including petroleum, coal, tin, natural gas, gold, silver, limestone, etc. Only some minerals, briefly described below, are mined commercially at the present time.

Oil fields have been located in the various parts of the province, more recently in Kuang, Belinbing, Liman Timur, Prebumulih, Tauying and Tiga region. Natural gas is extracted chiefly from the fields in Kayu Agung region from where it is piped to the PUSRI fertilizer plant at Palembang.

Tin mining operations are centered in Bangka Island. About half the national output is smelted at Mentok (Bangky Island) prior to export. In accordance with national policy, the smelting capacity is to be increased so that all mine output may be exported as tin metal. Recently completed UNDP mineral surveys identified

substantial additional reserves offshore the Bangka Island.

Coal has been worked since 1919 in the open coal mine, Bukit Asam at Tanjung Enim. The coal is of a good thermal quality, but not suitable for processing into conventional metallurgical coke required by the iron and steel industry. There has been a continued decline in coal mining in the project area since the early postwar years mainly because other fuels were more efficient and less costly. A new program for a massive increase in the coal mining operations is described in Section 1.4.

There is also some commercial mining of minerals used in the construction industry including limestone (Baturaja), clay (Prabumulih), quartz sand (Bangka and Belitung), andesite (Tanjung Enim) and granite (Bangka).

Mineral production in South Sumatra in 1973 is given in Table I-1.2-12.

#### 1.2.6.6 Trade

Palembang is the hub of South Sumatra's commerce, its principal population and administrative center and the greatest port for foreign, interisland and local cargo and passenger traffic.

Domestic waterborne trade of South Sumatra was estimated at 810,800 tons in 1972, excluding the oil refinery traffic. Of this total, some 90,000 tons was local cargo moved between the provincial ports. The region's principal trading partner was Western Java including the metropolitan Jakarta area. Distribution of interisland commerce is shown in Table I-1.2-13. Sawn timber, fertilizer, rubber tires, coal and textile

Table I-1.2-12  
Mining Production in South Sumatra

<u>Mineral</u>	<u>Measurement Unit</u>	<u>1973</u>
Crude Oil	000 Bbls	23,000
Coal	000 Tons	67
Tin	000 Tons	21
Kaolin	000 Tons	9
Quartz Sand	000 Tons	25
Natural Gas	000 MCF	73,000
Clay	000 Tons	3

Table I-1.2-13  
Domestic Seaborne Trade of South Sumatra in 1972  
 (Tons)

Province	Unloaded	Loaded	Total
Aceh	--	--	--
Sumut	11,300	20,500	31,800
Sumbar	31,000	1,900	32,900
Riay	19,500	20,700	40,200
Jambi	9,600	3,300	12,900
Sumsel	45,000	45,000	90,000
Bengkulu	--	--	--
Lampung	300	2,200	2,500
DKI Jaya	158,100	176,800	334,900
Jabar	1,200	19,900	21,100
Jateng	1,100	125,200	129,300
Jatim	84,400	15,700	100,100
Kalbar	1,500	600	2,100
Kalteng	--	200	200
Kalsel	500	--	500
Kaitim	100	3,200	3,300
Sulut	--	--	--
Sulteng	--	--	--
Sulsel	1,000	600	1,600
Sultengg	1,700	--	1,700
Bali	500	2,100	2,600
NTB	1,900	1,200	3,100
<b>TOTAL</b>	<b>371,700</b>	<b>439,100</b>	<b>810,800</b>

yarn were the principal non-oil products shipped from South Sumatra to other islands. Rice, sugar, salt and cement were among the leading commodities brought to the project area.

Most of South Sumatra's foreign trade has been with Singapore except for log exports which go to Japan and coffee which is exported to Europe. Local rice and sugar deficits have been met in part by imports from Thailand and India respectively.

### 1.3 Past Cargo Trends.

The cargo which is handled by the Port of Palembang is subdivided into six groups. These are : imports, exports, interisland inward, interisland outward, local inward, and local outward. Statistics on the tonnages of major commodities handled have been maintained since 1971. In 1974 two reporting periods were used, this section uses April 1974 to March 1975.

#### 1.3.1 Imports.

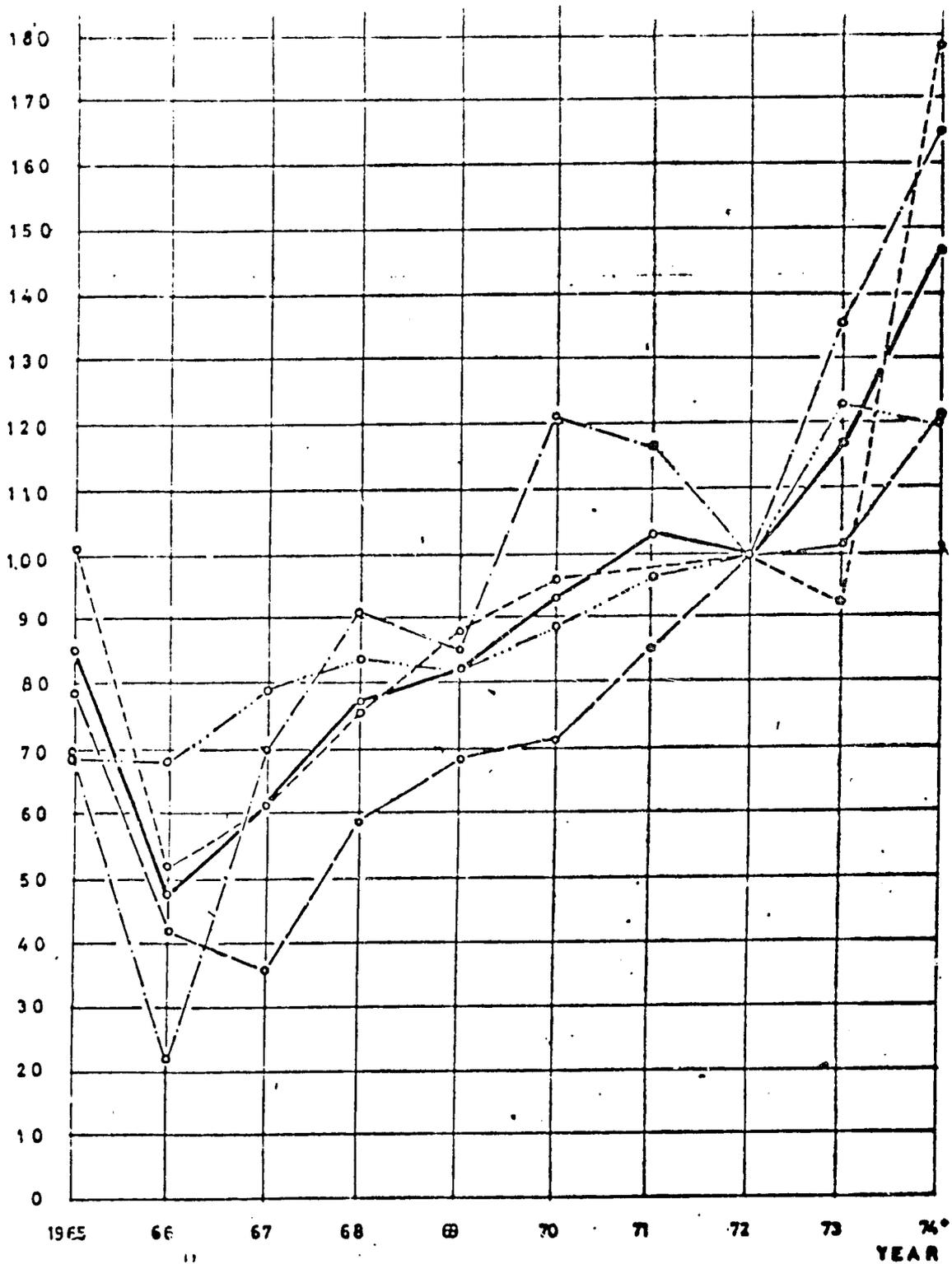
The primary imports handled by the Port include rice, sugar, cement and asphalt. The total quantity of imports has increased, from 1967 when only 105 thousand tons were handled to 1974 when 203 thousand tons were received. The average rate of growth has been 10% but the actual trend has been somewhat erratic as can be seen in Figure I-1.3-1. The period from April 1974 to March 1975 saw a slight downturn in total demand for imports as well as in the specific demand for rice, sugar and cement (Table I-1.3-1). These reductions are related to the general downturn in the level of economic activity rather than to increasing self-sufficiency of the region in these commodities.

The primary origins of these imports are listed in Table I-1.3-2. Singapore remained the major source of imports providing over 1/3 of the total. Japan and Thailand accounted for another third, Korea, India and the USA also provided major tonnages. The tonnages received from these countries is listed in the same table. Singapore has been a major origin throughout the present decade, but the quantities received from Japan and Thailand have been steadily increasing. The changes in tonnages shipped per origin over the past 4 years is shown in the graph in Figure I-1.3-2.

### 1.3.2 Interisland and Local - Inward.

The primary interisland cargoes which were unloaded at the Port of Palembang include sugar, rice, cement, flour and asphalt. The total amount of interisland cargo unloaded increased from 104 thousand in 1971 to 165 thousand in 1974. The tonnages of all primary commodities, with the exception of sugar, increased during this period.

The local cargo unloaded during this period increased in tonnage from 59 to 65 thousand tons, however, there was no steady growth. The tonnages handled for this four year period are shown in Table I-1.3-3. The average rate of growth of the combined tonnage of interisland and local cargoes from 1968 to 1974 was 13% per year.



**LEGEND**

- IMPORTS
- EXPORTS
- INTERISLAND & LOCAL INWARD
- INTERISLAND & LOCAL OUTWARD
- TOTAL

BASE YEAR 1972

FIGURE I - 1.3-1  
 TREND IN CARGO FLOWS 1965 - 1974  
 ( EXCLUDING LOGS AND OIL IN BULK )

TABLE I - 1.3-1

I M P O R T S (000's tons)

	<u>1974*</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>1965</u>
Rice	54.9	90.5	43.8	31.3						
Sugar	10.1	21.6	--	5.5						
Cotton	3.0	2.8	1.8	1.9						
Flour	.5	1.9	--	13.6						
Cement	23.5	26.4	17.4	31.2						
Asphalt	9.9	2.1	4.1	19.3						
Salt	1.8	--	3.2	--						
Fertilizer	5.7	1.5	.5	--						
Other	93.3	99.0	78.2	72.2						
Total	<u>202.7</u>	<u>245.8</u>	<u>149.0</u>	<u>175.0</u>	<u>181.-</u>	<u>126.-</u>	<u>136.-</u>	<u>105.-</u>	<u>33.-</u>	<u>104.-</u>

April 1974 - May 1975

Source : BPP Annual Reports & Nedeco //12

TABLE I - 1.3-2

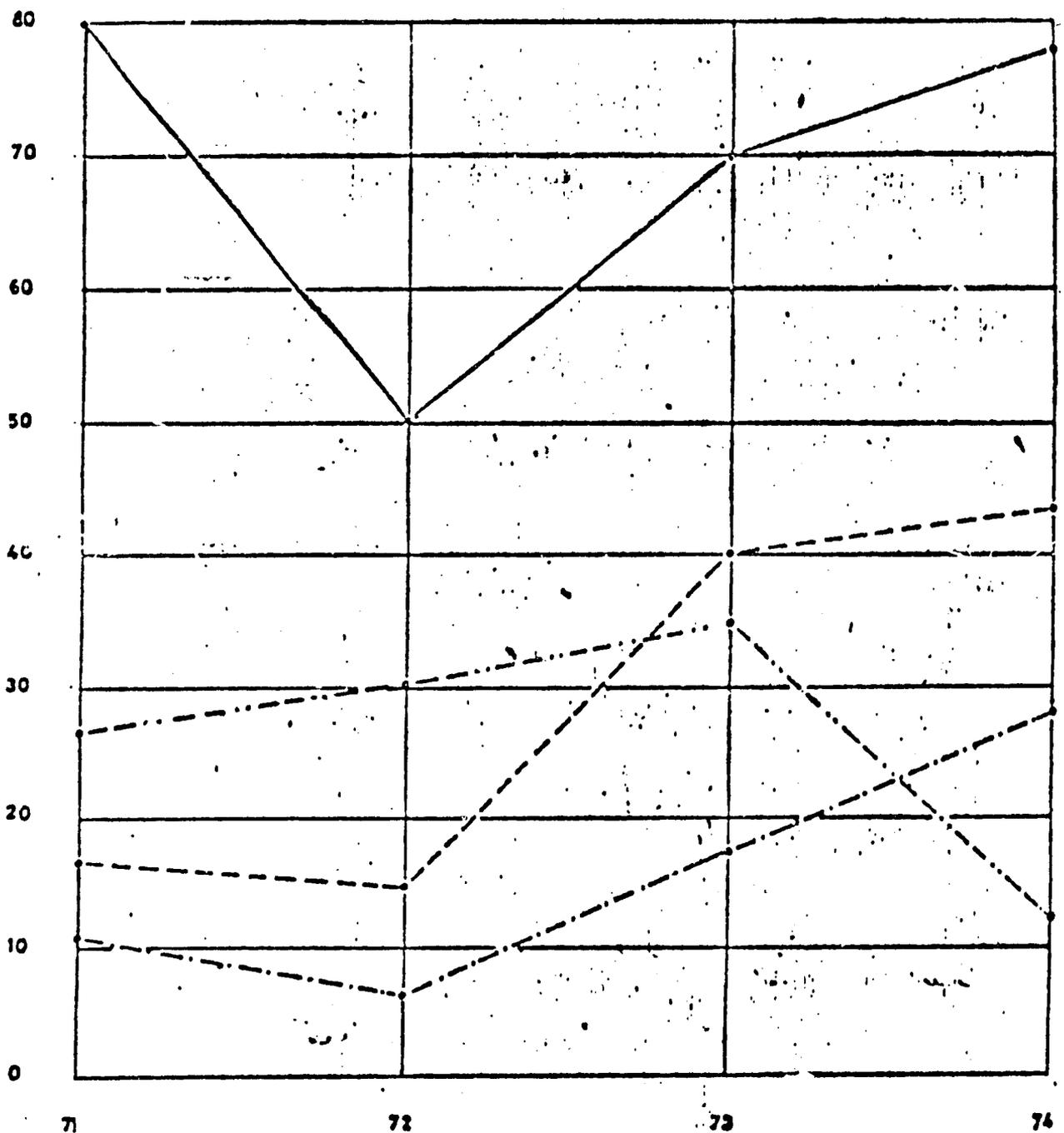
MAJOR IMPORT ORIGINS

(000 tons)

	<u>1975*</u>	<u>1974**</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>
Singapore	39.8	78.1	70.0	50.4	80.1
Japan	15.4	43.7	40.0	14.3	16.5
Thailand	3.4	28.1	17.3	6.7	11.0
Korea	18.2	22.3	--	9.0	14.4
U.S.A.	8.4	12.2	34.9	30.4	26.6
Europe	.2	2.4	5.1	14.1	8.7
India	5.8	15.7	5.0	3.2	--
Pakistan		--	9.3	5.1	5.5
Hongkong	8.8	--	47.4	9.9	--
Taiwan		--	11.7	4.1	1.0
Australia		--	1.0	1.2	.8

\* January 1975 - June 1975

\*\* April 1974 - March 1975



74 APRIL - 73 MARCH

LEGEND:

- : SINGAPORE
- - - : JAPAN
- . - . : THAILAND
- . . . . : USA

FIGURE : I - 1.3-2

MAJOR IMPORT ORIGINS (000S TONS)

SOURCE : B . P . P . ANNUAL REPORTS

TABLE I - 1.3-3

INTERISLAND & LOCAL CARGO UNLOADED (000's tons)

	<u>1974*</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>1965</u>
<u>Interisland</u>										
Sugar	29.9	32.5	39.6	31.6						
Rice	26.0	13.8	8.2	21.0						
Cement	51.3	39.3	32.2	25.7						
Flour	11.8	17.5	2.6	2.2						
Asphalt	8.0	5.5	4.2	--						
Salts	14.2	19.1	17.9	14.5						
Others	24.1	15.4	20.4	8.7						
Total	<u>165.3</u>	<u>143.1</u>	<u>125.1</u>	<u>103.7</u>						
<u>Local.</u>										
Coconut oil	15.2	13.5	13.0	11.7						
Others	50.2	61.3	52.9	47.2						
Total	<u>65.4</u>	<u>74.8</u>	<u>65.9</u>	<u>58.9</u>						
All Total	231	218	191	163	135	132	112	68	81	151

\* April 1974 - March 1975

Source : BPP Annual Reports & Nedeco #12

### 1.3.3 Exports.

The primary exports from the Port of Palembang are rubber, coffee, wax and logs. The rubber and coffee are milled along the banks of the Nusi and are transferred directly from the mills to the ships in the stream. Although the amount of rubber exported declined in 1975 due to a slump in the world market, the quantity shipped has been increasing since 1966 at an average annual rate of 7.5%. The amount of coffee exported has fluctuated during the last decade in a range between 20 and 40 thousand tons; the amount shipped in 1974 was about 37 thousand tons. The export of wax, primarily paraffin derived from the petroleum refined at Pertamina's facilities, has increased from 7 thousand tons in 1968 to 51 thousand tons in 1974. The shipment of logs has increased significantly in the last two years. From 1970-72 the quantity exported remained around 150 thousand cubic meters, but in 1973 it climbed to 552 thousand cubic meters and was only slightly lower in 1974. Table I-1.3-4 lists the quantity of each of these commodities which was exported during the last 10 years. The average rate of growth for all exports has been about 6.5% since 1965.

The primary destination for these exports is Singapore which received over 2/3 of the export tonnage, excluding logs, in 1974. The second most important destination is the USA which received 46 thousand tons of exports from Palembang. The tonnages handled by both of these countries has been increasing as is shown in Table I-1.3.5.

The primary market for logs remains Japan. The amount shipped to Japan in 1974 was 326,000 cubic meters versus 146,000 in 1970, however, the relative share for Japan has decreased in recent years as new markets have developed in Taiwan and Korea. A breakdown of the volumes shipped by destination is given in Table I-1.3.6.

### 1.3.4 Interisland and Local Cargoes - Outward

The primary interisland cargo shipped out of Palembang is urea produced at the PUSRI fertilizer plant. The quantity shipped has increased rapidly as the size of the plant has increased. With the completion of the phase II construction the capacity of the plant has increased to 480,000 tons (See Table I-1.3-7) In 1974 a total of 224 thousand tons was shipped out.

TABLE I - 1.3-4

EXPORTS (000's tons)

<u>Year</u>	<u>RUBBER</u>	<u>COFFEE</u>	<u>W A X</u>	<u>OTHERS</u>	<u>T O T A L</u>	<u>L O G S</u> <u>(000'S M3)</u>
1974*	146.9	36.7	31.4	9.0	224.0	493.-
1973	163.0	21.8	30.8	14.2	229.8	552.3
1972	129.4	26.9	21.2	9.1	186.6	154.-
1971	125.6	21.0	23.7	8.2	178.5	140.3
1970	112.4	25.1	24.7	4.6	166.8	158.-
1969	106.7	33.4	9.3	5.0	154.4	
1968	110.7	28.4	8.4	10.5	158.0	29.7

\* April 1974 - March 1975

Source : BPP Annual Reports & Nedeco #12

TABLE I-1.3-5

MAJOR EXPORT DESTINATIONS

(000's tons)

<u>Year</u>	<u>U.S.A.</u>	<u>Europe</u>	<u>Singapore</u>	<u>Phillipines</u>	<u>Australia</u>	<u>Jeddah</u>	<u>Hongkong</u>	<u>Japan</u>	<u>Thailand</u>
1975+	19.3	6.2	77.5	-	-	-	0.8	0.7	--
1974*	45.6	15.9	159.9	0.1	0.4	3.2	1.0	0.7	--
1973	38.4	13.5	167.2	3.5	0.4	-	4.1	0.3	0.3
1972	29.0	17.9	122.0	2.5	0.2	-	4.8	0.9	3.2
1971	37.9	10.0	114.5	5.1	-	-	3.3	1.1	2.1
1970	39.2	8.7	105.6	3.0	0.2	-	2.7	2.7	0.9
1969	37.0	3.4	95.2	0.1	-	-	1.3	36.8	4.8
1968	40.1	6.8	76.0	-	-	-	0.5	26.0	3.2

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\* April 1974 - March 1975

+ January 1975 - June 1975

TABLE I - 1.3-6

DISTRIBUTION OF LCGS BY DESTINATION (000 m<sup>3</sup>)

<u>Year</u>	<u>Japan</u>	<u>Singapore</u>	<u>Taiwan</u>	<u>Korea</u>
1970	146	11	--	--
1971	133	4	3	--
1972	134	15	3	--
1973	347	50	92	57
1974	326	15	111	38
1975*	89	1	63	8

\* January 1975 - June 1975.

TABLE I-1.3-7

INTERISLAND & LOCAL CARGO LOADED (000's tons)

	<u>1974*</u>	<u>1973</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>1965</u>
<u>Interisland</u>										
Fertilizer	224.3	96.8	97.3	103.6						
Fuel oil	35.3	—	1.2	—						
Oil products †	16.9	4.9	0.4	1.4						
Plywood	7.1	—	—	—						
Others	15.6	2.3	1.0	19.1						
	<hr/>	<hr/>	<hr/>	<hr/>						
TOTAL	300.2	104.0	99.9	124.1						
<u>Local</u>										
Coal	4.9	2.1	19.9	32.4						
Oil products †	63.0	69.1	72.1	68.1						
Others	34.2	32.0	32.1	36.5						
	<hr/>	<hr/>	<hr/>	<hr/>						
TOTAL	102.1	103.2	124.1	137.0						
All Total	102	207	225	261	216	199	170	137	118	258
Logs (000's M <sup>3</sup> )	7.9	7.1	1.5	2.2						

\* April 1974 - March 1975

† Kerosene, fuel oil, LPG, Wax

Source : EPF Annual Report & Nedeco # 12-

of PUSRI's wharf. The primary destinations for the urea are the bagging plants at Tanjung Priok, Cilacap, Surabaya, Cirebon and Semarang. The other interisland outward cargo amounted to 76 thousand tons in 1974, however, this included 35 thousand tons of fuel in lighters which loaded at Pertamina wharves.

The primary local cargoes which are loaded in the Port of Palembang include fuel oil and kerosene. Coal was once a major local cargo but the tonnage handled declined steadily and amounted to only 29 thousand tons in 1974. The total tonnage of local and interisland cargo loaded in Palembang has fluctuated over the last ten years. If the tonnage generated by Pusri is ignored then the tonnage loaded in 1974 was below the average for this period. These figures are shown in Table I-1.3-8.

#### 1.3.5 Petroleum

The largest tonnages handled in the Port of Palembang are generated by the refineries at Sungai Gerong and Plaju. Pertamina operates both these refineries. They are presently supplied with crude via both pipeline and tanker. The present capacity of the refineries is 70,000 barrels per day for Sungai Gerong and 110,000 barrels per day for Plaju; this amounts to an annual capacity of 8.5 million tons. These refineries have been operating at between 40 and 60% of capacity over the last ten years. The amount of crude unloaded from ships has been decreasing from an annual average of about four million tons in the first five years of the 60's to three million tons in the first five years of 1970. The amount of petroleum products exported from Palembang has declined due to the increase in national demand so that now all products are shipped either interisland or locally. The tonnage shipped out has fluctuated over the past decade between 3 and 6 million. In 1974 the total tonnage shipped out was 4.5 million tons. The tonnages handled at the Pertamina facilities for the last five years

are given in detail in Table I - 1.3-9. These volumes are those that were reported to the port, and though they have not been verified by Pertamina, they are thought to be reasonably accurate.

TABLE I - 1.3-8

TONNAGE SHIPPED BY PUSRI PAST, PRESENT & FUTURE.

(000's tons)

<u>Year</u>	<u>Quantity</u>		
1971	103.6		
1972	97.3		
1973	96.8		
1974	224.3		
	<u>Capacity</u>	<u>In Bags</u>	<u>In Bulk</u>
1975	480	100	380
1977	1000	100	900
1980	1500	100	1400

TABLE I - 1.3-9

PETROLEUM HANDLED AT PIAJU & SUNGAI GERONG\*  
(in 000 tons)

<u>Year</u>	<u>Import</u>	<u>Export</u>	<u>Interinsular &amp; Local</u>		<u>Total</u>
			<u>Inward</u>	<u>Outward</u>	
1970	--	851	4073	3256	8180
1971	--	360	3053	3022	6435
1972	--	214	2052	5120	7386
1973	9	--	3173	5548	8721
1974	--	261	2418	4212	6891
1975		--	2650	3900	6550

Source : BPP statistics, Pertamina statistics

\* Excludes oil products such as lube oil and locally distributed fuel oil

## 1.4 PORT CARGO STUDIES AND FORECASTS

### 1.4.1 Introduction

The primary purpose of the traffic forecasts which follow is to determine the need for an expansion of existing terminal facilities at the Port of Palembang. Traffic forecasts will also serve as the basis for the analysis of the port's operational needs and a determination of its physical expansion.

In addition to their primary function, the traffic estimates should serve other purposes as well. As will be shown at some length later in the text, the traffic projections used in this study comprise several separate variables (i.e. traffic streams). Each variable, in turn, is based on a number of assumptions which are discussed in some detail. Taken together, the variables and the assumptions which underlie them create a working projections model, the various parts of which can be modified or updated, as new information affecting them becomes available. Hence, it should be possible for the Palembang Port Authority to refine and, if needed, to modify this model so as to use it as a policy-making tool in the Authority's operations, eliminating much guess work from the Authority's planning efforts. It may also assist the Authority to correlate its policies and objectives with those of the country and the region as a whole.

It should be said, however, that before any use of the model is contemplated, its various component parts should be thoroughly examined in the light of existing information, as well as for its internal consistency. The model, in its present form, is inexact and probably incomplete. It is so because

of the time and data limitations and conditions under which it has been prepared.

Time limitations were necessitated by the urgency of relating the forecasts to a specific program for the improvement of the port. A more serious problem has been encountered with regard to the availability and quality of port cargo statistics. The inadequacy or lack of port statistics in the developing countries is a widespread phenomenon that has long been a source of concern to port planners.\* In Palembang, port traffic reporting is additionally hindered by a de facto autonomy of several major port users and a multitude of cargo handling facilities and operations in the port area. Since certain principal port users report only partial cargo movements, information from Port Authority sources is adjusted to include other cargo flows identified by the consultant. Furthermore, the current port traffic classifications were not designed for planning and suffer from lack of clarity and comparability.

Before turning to specific commodity studies and projections, a final note is needed. Because of its regional significance, the port of Palembang serves as a transshipment port for other minor ports in Sumatra and nearby islands. To an unknown extent this transshipment is direct (ship-to-ship) and, therefore, represents doublecounting. The volume of double counted cargo is not considered significant for the purpose of this study.

\*United Nations, Port Statistics, New York, N.Y., 1972

#### 1.4.2 Port Cargo Traffic

The port of Palembang handles international, interisland and local cargo traffic. Both public and private facilities are available to load, unload and store port cargo. A substantial volume of cargo is handled directly between the ships and barges in the midstream. The bulk of log exports is loaded aboard the ships outside the port, but within the port customs area.

The basic categories of port cargo published by the PPA include foreign shipments (exports and imports), interisland cargo shipments and arrivals, local cargo loaded and unloaded in the port area and, as a separate category, cargo moved in sailing vessels.\*

Traffic volume for each cargo category in 1974 is shown on Tables I-1.4-1 through I-1.4-4. Estimated allocations of cargo traffic to individual cargo handling facilities are also shown. Table I-1.4-5 summarizes port traffic by major commodity flows and forms the basis for port cargo traffic forecasts.

Nearly 8 million tons of cargo were handled in the port area in 1974. Of the total, 7 million tons were crude oil and refined petroleum products moved by the Palembang's two refineries. Log exports were estimated at 619,000 m<sup>3</sup>, including 526,000 m<sup>3</sup> loaded aboard ships outside the port area. Fertilizer

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\* All domestic cargo shipped in motor ships 200 miles or more is classified as interisland, under 200 miles as local, with the exception of the route from Palembang to Jakarta which is serviced both by Nusantara and Local Shipping Line 5. River boat deliveries or pickups from various private godowns in the port area are not recorded as port traffic. All cargo shipped in sailing vessels, regardless of distances, is recorded as sailing ship cargo.

Table I-1.4-1  
Foreign Cargo Traffic in Port of Palembang in 1974  
[000 Tons]

Commodity	Port Facilities								Principal Trading Area	
	Boom Baru	Pusri Wharf	Log Pond	Pertamina Wharves	Mid Stream	Rail Wharf	Salt Wharf	Other		Total
<u>Imports</u>										
Rice	39.7				11.5				51.2	Bangkok
Sugar	7.1				3.3				10.4	India
Cotton	3.4								3.4	U.S.A.
Flour					0.5				0.5	Singapore
Cement	0.6				14.9				15.5	Singapore
Crude Oil				30.0					30.0	Singapore
Fertilizer		4.5							4.5	Singapore
Oil Products	11.0			85.1					96.1	Singapore
Other	53.0	1.9		27.4	0.6				82.9	
<b>Total Imports</b>	<b>114.8</b>	<b>6.4</b>		<b>142.5</b>	<b>30.8</b>				<b>294.5</b>	
<u>Exports</u>										
Timber			92.8 <sup>1</sup>					526.0 <sup>1</sup>	618.8 <sup>1</sup>	Japan
Rubber					149.0				149.0	Singapore
Coffee					39.5				39.5	Europe
Crude Oil					31.7				31.7	Singapore
Oil Products	0.6			229.0					229.6	Singapore
Scrap Iron					2.3				2.3	Singapore
Sesame Seed					2.8				2.8	Singapore
Other	2.3				1.8				4.1	Singapore
<b>Total Exports</b>	<b>2.9</b>		<b>(1)</b>	<b>229.0</b>	<b>227.1</b>			<b>(1)</b>	<b>459.0<sup>1</sup></b>	
<b>Grand Total</b>	<b>117.7</b>	<b>6.4</b>	<b>(1)</b>	<b>371.5</b>	<b>257.9</b>			<b>(1)</b>	<b>753.5<sup>1</sup></b>	

(1) Timber exports shown in thousand m<sup>3</sup> and not included in total. An estimated 526,000m<sup>3</sup> of logs were exported from outside the port.

Table I-1.4-2  
Interisland Cargo Traffic in Port of Palembang in 1974  
 (000 Tons)

Commodity	Port Facilities								Principal Trading Area	
	Boom Baru	Pusri Wharf	Log Pond	Pertamina Wharves	Mid Stream	Rail Wharf	Salt Wharf	Other		Total
<u>Unloaded</u>										
Sugar					32.6				32.6	Surabaya
Rice					32.0				32.0	Surabaya
Timber								2.0	8.0	Mesuji
Salt	8.2						10.4		18.6	Madura
Cement	46.4								46.4	Padang
Flour					11.4				11.4	Surabaya
Crude Oil				2388.3					2388.3	
Fertilizer		0.5							0.5	Belawan
Oil Products	10.1								10.1	
Other	13.4			37.6					51.0	Jakarta
<b>Total Unloaded</b>	<b>78.1</b>	<b>0.5</b>		<b>2425.9</b>	<b>75.9</b>		<b>10.4</b>	<b>8.0</b>	<b>2598.9</b>	
<u>Loaded</u>										
Fertilizer		171.7							171.7	Pulau
Oil Products				4137.9					4137.9	Java
Coal						1.1			1.1	Bangka
Plywood					3.0				3.0	Jakarta
Timber <sup>1</sup>			3.2						3.2	Jakarta
Other	0.9	2.3				0.7			3.9	Jakarta
<b>Total Loaded</b>	<b>0.9</b>	<b>174.0</b>	<b>(1)</b>	<b>4137.9</b>	<b>3.7</b>	<b>1.1</b>			<b>4317.6</b>	
<b>Grand Total</b>	<b>79.0</b>	<b>174.5</b>	<b>(1)</b>	<b>6563.8</b>	<b>79.6</b>	<b>1.1</b>	<b>10.4</b>	<b>8.0</b>	<b>6916.5</b>	

(1) Volume in thousand m<sup>3</sup>; not included in totals.

Table I-1.4-3  
Local Cargo Traffic in Port of Palembang in 1974  
 (000 Tons)

Commodity	Boom Baru	Pusri Wharf	Pertamina Wharves	Rail Wharf	Other	Total	Principal Trading Area/Port
<u>Unloaded</u>							
Flour	1.6					1.6	S. Kelapa
Coconut Oil	14.9					14.9	Rlau
Rubber	1.9					1.9	Pontianah
Rice	7.7					7.7	S. Kelapa
Oil Products	1.6					1.6	S. Kelapa
Other	36.0					36.0	S. Kelapa
<b>Total Unloaded</b>	<b>65.1</b>					<b>65.1</b>	
<u>Loaded</u>							
Sugar	1.5					1.5	Bangka
Fertilizer		1.8				1.8	Bangka
Coffee	1.5					1.5	S. Kelapa
Oil Products	3.7		58.4			62.1	Bangka
Timber <sup>1</sup>	8.7					8.7	S. Kelapa
Coal				27.9		27.9	Bangka
Other	19.3	1.9	0.1			21.3	S. Kelapa
<b>Total Loaded</b>	<b>26.0</b>	<b>3.7</b>	<b>58.5</b>	<b>27.9</b>		<b>116.1</b>	
<b>Grand Total</b>	<b>91.1</b>	<b>3.7</b>	<b>58.5</b>	<b>27.9</b>		<b>181.2</b>	

<sup>1</sup>Volume in thousand m<sup>3</sup>; not included in total.

Table I-1.4-4

Cargo Moved in Sailing Ships Via  
Palembang in 1974  
(Tons)

<u>Commodity</u>	<u>Volume</u>
<u>Unloaded</u>	
Coconut Oil	1,817
Flour	385
Salt	115
Other	<u>10,453</u>
Total Unloaded	12,770
<u>Loaded</u>	
Sawn Timber <sup>1</sup>	14,516
Sugar	291
Other	<u>397</u>
Total Loaded	688
Grand Total	13,458

<sup>1</sup>Volume in m<sup>3</sup>; not included in total.

Table I-1.4-5  
Cargo Movements in Port of Palembang in 1974  
(000 Tons)

Commodity	Foreign Trade			Domestic Trade			Total Cargo
	Imports	Exports	Total	Inter-Island	Local	Soil Ships	
Rice	51.2		51.2	32.0	7.7		90.9
Sugar	10.4		10.4	32.6	1.5	0.3	44.8
Cotton	3.4		3.4				3.4
Wheat&Flour	0.5		0.5	11.4	1.6	0.4	13.9
Cement	15.5		15.5	46.4			61.9
Crude Oil	30.0	31.7	61.7	2388.3			2450.0
Oil Products	96.1	229.6	328.7	4148.0	63.7		4537.4
Fertilizer	4.5		4.5	172.2	1.8		178.5
Rubber		149.0	149.0		1.9		150.9
Coffee		39.5	39.5		1.5		41.0
Coal				1.1	27.9		29.0
Plywood				3.0			3.0
Salt				18.6		0.1	18.7
Coconut Oil <sup>1</sup>					14.9	1.8	16.7
Sawn Timber <sup>1</sup>				11.2	8.7	14.5	34.4
Logs <sup>1</sup>		618.8	618.8				618.8
Other	82.9	9.2	92.1	54.9	57.3	10.9	215.2
<b>Total</b>	<b>294.5</b>	<b>459.0</b>	<b>753.5</b>	<b>5908.5</b>	<b>179.8</b>	<b>13.5</b>	<b>7101.8</b>

<sup>1</sup>Log shipments in thousand m<sup>3</sup> not included in total. Log shipments include 526,000 m<sup>3</sup> exported from outside the port.

shipments from the PUSRI urea plant were at 178,000 tons, the third largest port cargo category followed by rubber exports totalling 150,000 tons. Food products, coal and a wide range of finished consumer and capital goods represented the other 560,000 tons of port cargo.

As already mentioned, oil and fertilizer cargo was handled for the most part by Pertamina's and Pusri's waterfront facilities. Total cargo handled over Boom Baru - Palembang's public terminal - was estimated at 288,000 tons in 1974. This compares with 360,000 tons of non-oil cargo loaded or unloaded from the ships in the midstream. Smaller volumes of specific commodities, such as logs, coal and salt, were moved and stored in other facilities located in the port area. All cargo carried by prahus (sailing vessels), approximately 25,000 tons in 1974, used the sailing ship terminal adjacent to Boom Baru.

#### 1.4.3 Port Cargo Forecasts.

This study analyses and projects individual commodities and commodity groups using the port facilities. Several regional development and in-depth commodity studies prepared by others for South Sumatra and Indonesia in recent years, have been used in preparing port cargo projections. An effort has been made to update these studies to reflect the impact of the 1973-75 worldwide recession and recent developments in Indonesia's oil industry.

Projections of individual commodities and commodity groups are related to and projected in terms of socio-economic variables affecting and/or determining

their growth. These parameters described elsewhere in this study, include relevant demographic, economic, locational and technological considerations. For some products, estimates or development targets of principal port users have been utilized. We have also generally assumed throughout the whole study:

- rational economic behavior;
- government policies stimulating and encouraging economic growth and reducing or eliminating obstacles to such growth;
- availability of port facilities to handle projected cargo flows;
- absence of war and natural disaster.

### Rice

#### Present Situation

Rice is the principal staple crop in Indonesia and the project area. An estimated 408,000 tons were produced there in 1975. The main rice growing areas in the project port hinterland are shown in Figure I-1.4-1.

Despite widespread cultivation, the region does not produce enough rice for its own consumption. Over 70,000 tons of rice were brought in from outside for distribution in 1974. The official estimated deficit for 1975, prepared in the spring of that year, was 83,000 tons. Adverse agricultural developments during the year suggest that the actual deficit may be higher. Table I-1.4-6 presents rice production, consumption and deficit (surplus) estimates for different parts of the port hinterland in 1975.

#### Projections

The per capita consumption of rice has grown

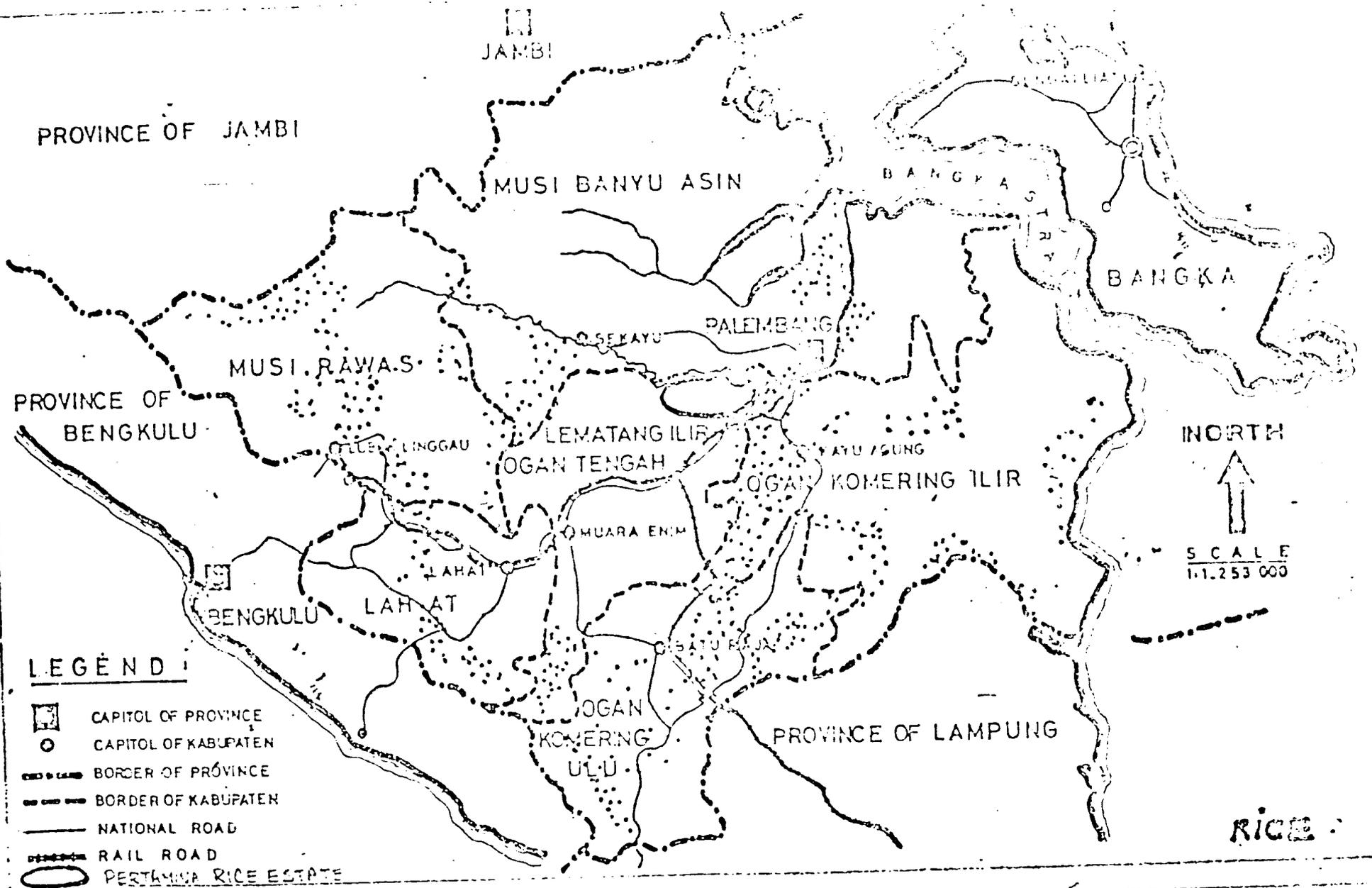


FIGURE I-1.4.-1 MAIN RICE GROWING AREAS

SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

Table I-1.4-6

Estimate of Rice Production, Consumption  
and Deficits in South Sumatra in 1975  
(000 Tons)

<u>Region</u>	<u>Production</u>	<u>Consumption</u>	<u>Deficit (-)</u> <u>Surplus (+)</u>
Palembang	12.8	83.2	- 70.4
Muba	70.9	53.8	+ 17.2
O.K.I.	77.0	63.6	+ 13.4
O.K.U.	87.0	77.4	+ 9.6
Liot	41.8	51.9	- 10.1
Lahat	65.8	53.0	+ 12.8
Mura	47.1	36.1	+ 11.0
Pinang		10.7	- 10.7
Bangka	5.3	43.4	- 38.0
Belitung	0.4	18.4	- 18.0
Total	408.1	491.4	- 83.3

rapidly in recent years in Indonesia and the project area. According to official sources, it was estimated at 131 kg per person per annum in South Sumatra in 1975. A low, but positive, income elasticity of demand for rice has been projected for Indonesia in recent FAO studies.\* In the long run, the per capita demand growth will level off and possibly decline, reflecting changes in dietary preferences and nutrition standards.

On the production side, some increases are expected from higher yields on existing farms and from the extension of rice cultivation to new areas. The implementation of the Pertamina's rice estate project will provide an additional supply of rice for local consumption. Also likely, but not specifically considered in the forecast, are rice surpluses from the agricultural development of the Banyuasin region.

Projections of rice demand, production and deficit in the project are summarized in Table I-1.4-7.. It will be noted that the expected level of rice imports will show little change over the period under review although one can expect substantial year-to-year fluctuations.

### Sugar

#### Present Situation

Per capita sugar consumption in Indonesia has nearly doubled since the early 1960s, but still remains at 9 kg p.a., among the lowest in the world. The total sugar demand has grown at over 5% annually, due in part to the heavy subsidies by the government which considers sugar an essential foodstuff.

\*FAO, Agricultural Commodity Projections 1970-1980, Rome 1971.

Table I-1.4-7

Projections of Rice Shipments Via Palembang  
(000 Tons)

<u>Year</u>	<u>Volume</u>
1974	90.9
1980	154.0
1985	162.0
1990	170.0
1995	193.0
2000	189.0

Indonesia grows sugar, but not enough to supply its own demand. Domestic sugar is grown mainly in Java with more than 75% of total output produced by state-owned estates. Sugar production has increased erratically in recent years at an average annual rate of slightly over 6% as shown in Table I-1.4-8.

No sugar is grown in the project area. A total of 43,000 tons were unloaded in the port of Palembang in 1974. Nearly 2,000 tons were subsequently transshipped by water to nearby destinations.

BULOG, a state food distribution agency, has a monopoly on local sales of imported sugar. Domestic sugar is distributed by BULOG and private business, the latter accounting for about 10,000 tons in 1974.

An indication of the inland market for sugar shipped via Palembang can be gathered from the BULOG sales to its authorized distributors shown in Table I-1.4-9. Sugar brought in by private business is sold primarily in the Palembang area.

#### Projections

Repelita II target for sugar is to increase domestic production by 6% annually. Even higher production targets were considered possible by a consortium of British consultants commissioned by the World Bank to study the Indonesian sugar industry. The Government of Indonesia is trying hard to meet these figures by rehabilitating and expanding the sugar industry with financial aid from the World Bank and Asian Development Bank. Since expansion of sugar production in the traditional areas of Java is hampered by competing demands on land and manifold administration and management problems in the government-

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Table I-1.4-8

Sugar Production and Consumption in Indonesia  
(000 Tons)

<u>Year</u>	<u>Production</u>	<u>Imports</u>	<u>Apparent Demand</u>
1968	752	108	806
1969	922	78	1000
1970	873	118	991
1971	1041	150	1191
1972	1131	15	1146
1973	944	162	1106
1974*	1080	113	1193

\*Aggregate demand was dampened in 1974 by a 20% increase in the wholesale price of sugar.

owned mills, Government interest in plans for expanding sugar production in the outer islands (including South Sumatra) is increasing.

Recently, a team from the Directorate-General of Plantations conducted surveys on the possibilities of establishing a trial sugar cane plantation in South Sumatra. The areas surveyed were Cintamanis, Musi Banyuasin, Betung, Petanggan, Beturaja, Martapura (OKU) and Subanjeriji (LIOT). The Directorate reportedly intends to open 14 sugar-cane plantations with a total area of 20,000 has. and to build 10 sugar factories with a capacity of 8,000 tons a day. In addition, extensive sugar plantations (including five sugar mills) are under construction or in advanced planning stages in the adjacent province of Lampung.

The overall effect of consumer preferences and availability of more locally produced sugar will be an initial increase in the rate of seaborne sugar shipments, with some levelling off in the latter part of the period under review. Table I-1.4-10 summarizes projections of water shipments of sugar via the project port.

#### Cotton

##### Present Situation

Several textile plants are located in the Palembang area, including a large scale (900 employees) state-owned spinning mill. Cotton is the principal raw material and is imported mainly from the United States. The state-owned mill produced for the national market and the production levels and raw material purchases are only marginally related to port hinterland requirements.\*

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\*Only 20% of the mill's output is sold in Sumatra.

Table I-1.4-9

Official Sugar Sales in Port Hinterland  
in April 1975

<u>Area</u>	<u>Tons</u>	<u>%</u>
Palembang	1850	47.8
Muba	275	7.1
O.K.I.	275	7.1
O.K.U.	300	7.8
Liot	240	6.2
Lahat	325	8.4
Mura	325	8.4
Bangka	250	6.4
Belitung	<u>150</u>	<u>3.9</u>
Total	3870	100.0

Table I-1.4-10  
Sugar Shipments in Palembang

<u>Year</u>	<u>Unloaded</u>	<u>Loaded*</u>	<u>Total</u>
1974	43,000	2,000	45,000
1980	76,200	3,300	79,500
1985	120,000	4,300	124,300
1990	150,000	4,200	154,200
1995	182,000	3,500	185,500
2000	221,000	3,300	224,300

\*Secondary Distribution by water

### Projections

National demand for textile products has grown rapidly, reflecting both the population growth and rising per capita consumption. According to the Directorate General of Textiles, the demand for cotton is projected to grow at 9% annually in the near term future. Over a longer period of time, increasing competition should come from the synthetic fibres to be produced by the Palembang's petrochemical complex. Plans are also underway to expand national production of cotton - now supplying only 1% of total demand, including cotton plantations in the project area. Finally, it is expected that an increasing share of the spinning mill's output will be consumed within the project area and depend only partially on water transport. Table I-1.4-11 presents projections of seaborne shipments of cotton based on the trends and assumptions discussed above. Seaborne shipments of textile products are projected as general cargo movements elsewhere in this study.

### Wheat and Flour

#### Present Situation

No wheat is produced in Indonesia and all wheat for domestic consumption is imported. Because of the relatively narrow demand in Sumatra and centralized purchasing, imported wheat and flour are transshipped to Palembang from Java ports. Approximately 80% of locally consumed wheat and flour is distributed by BULOG, an official marketing agency which sells it through 13 authorized dealers located throughout South Sumatra. Table I-1.4-12 shows official sales to different parts of the project area in April 1975. The remaining

Table I-1.4-11

Cotton Shipments via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Volume</u>
1974	3.4
1980	5.6
1985	6.9
1990	8.9
1995	10.6
2000	11.9

Table I-1.4-12

Official Wheat and Flour Sales in Port of Palembang  
in April 1975  
(Tons)

<u>Area</u>	<u>Tons</u>	<u>%</u>
Palembang	875	41.7
Muba	100	4.7
O.K.I.	140	6.7
O.K.U.	135	6.4
Liot	125	6.0
Kahat	175	8.3
Mura	325	15.5
Bangka	125	6.0
Belitung	100	4.7
Total	<u>2100</u>	<u>100.0</u>

20% is brought in by private business and sold primarily in the Palembang area.

#### Projections

FAO projections of demand for wheat and flour indicate an average annual growth of about 4% through 1980. Demand for wheat in Indonesia is income-elastic; as per capita income levels rise, wheat increasingly replaces rice in the urban population diet. There is reason to believe that FAO's projections, based on very conservative income growth assumptions, will fall short of actual demand.

This study assumed an initial average growth of 6% per annum, gradually declining to 2.5% per annum by the end of the forecast period, as shown in Table I-1.4-13.

#### Cement

##### Present Situation

No cement is produced in the project area. Of the 62,000 tons of cement unloaded in Palembang in 1974, three-fourths originated elsewhere in Indonesia and one-fourth was imported. Cement is also unloaded in other ports serving the project area including Jambi, Bangka and Belitung. No accurate data for the secondary ports are available, but the total volume of cement unloaded in these ports in 1974 is estimated at 12,000 tons.

The cement traffic showed rapid growth through 1973, rising at an average annual rate of 12-13%. A sudden jump in imported cement prices dampened the demand in 1974, but the situation improved in 1975 following the government's stabilization measures and the opening of two large cement factories in Indonesia.

Table I-1.4-13

Wheat and Flour Shipments via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Volume</u>
1974	13.9
1980	19.5
1985	24.9
1990	30.4
1995	35.2
2000	39.8

### Projections

Cement movements through the project port are expected to change fundamentally as a result of the construction of a cement factory at Baturaja in the project area. The cement plant, established by domestic interest with the ADB financing, is scheduled to start production in 1978. As presently envisaged, the Baturaja cement plant will produce initially about 500,000 tons of clinker per annum. One-half of this volume will be railed to Palembang where a grinding plant will be constructed on the Musi River bank near the Keratapi wharf.\* The expansion of the Baturaja plant's capacity to over 1 million tons annually is planned for 1983.

The cement produced at Palembang will replace inward cement shipments to the project area including Jambi province and the islands of Bangka and Belitung. A large portion of local output will be distributed within the province by road and rail. River transport including coastal shipments to Jambi, Bangka and Belitung will become a part of the distribution network. Occasional production surpluses will be exported or shipped to other parts of the country. Finally, input requirements for the Palembang and Baturaja plants will be shipped to and unloaded in the port of Palembang.

National estimates of cement consumption project average annual rates of 17-20% through the mid 1980s, compared with a rate of nearly 21% during the most

\*The other 250,000 tons of clinker will be railed to a grinding plant to be located at the port of Teluk, Bayur in Lampung.

## Crude Oil and Oil Products

### Present Situation

Crude oil is found in the port hinterland and in the adjacent Jambi province. (See Figure I-1.4-15) All oil producing areas are onshore, but offshore oil strikes have been reported recently. Crude from the existing fields (19.4 million bbls. in 1974) is piped to meet partial requirements of the two oil refineries in Palembang. The balance (18.2 million bbls. in 1974) of crude oil intake was shipped to the refineries from other oil producing areas in Indonesia.\* Small volumes of crude oil and oil products are imported.

Substantial volumes of natural gas also are produced in the project area and piped to a fertilizer plant (PUSRI) in Palembang for use in the production of urea. Natural gas is also used by Pertamina refineries and the local electric power company.

Crude oil brought to Palembang is refined in the Pertamina's Gerong and Plaju refineries for local distribution, export or shipment to other parts of Indonesia. According to Pertamina, the refinery output in 1974 is shown in Table I-1.4-15.

The principal export items are paraffin wax and waxy residues shipped to Singapore. The composition of refinery products sold in the domestic market is as shown in Table I-1.4-16. Crude and petroleum product movements through the port show little change in recent years despite the growing output and exports of Indonesia's petroleum industry.

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\*Because of contraction in demand in 1974, a higher-than-average share of crude intake was supplied by pipeline.

recent (1970-74) period. Compared with the national trends, the demand for cement via Palembang lagged in recent years, although there is some doubt about the comprehensiveness of port cement statistics.\* The expansion of the PUSRI fertilizer plant and other development projects in the port service area indicate a higher annual demand rate for cement in the immediate future. This study assumes that the regional demand for cement will increase at 15% p.a. through 1985 and at declining growth rates thereafter. It is further assumed that the cement grinding facilities will expand in response to the growing demand, that only a part of locally consumed cement will move by water and that temporary production surpluses or deficits will be adjusted through foreign trade or interisland cement shipments. A forecast of cement shipments and annual input requirements for the Palembang and Baturaja plants shipped through the port based on these assumptions is presented in Table I-1.4-14.\*\*

\*Direct cement imports by Pertamina and PUSRI, the two largest industrial establishments in Palembang with own port facilities are not fully reflected in the port statistics.

\*\*According to PT Semen Baturaja, input requirements for the stage I development are estimated at 25,000 tons and comprise the following:

<u>Inputs</u>	<u>Palembang</u>	<u>Baturaja</u>	<u>Total</u>
Grinding balls	350	350	700
Iron Sand	-	8,300	8,300
Spare Parts	500	700	1,200
Refractories	-	1,700	1,700
Gypsum	10,000	-	10,000
Kraft Paper	3,000	-	3,000
TOTAL	<u>13,850</u>	<u>11,050</u>	<u>24,900</u>

The total volume excludes fuel oil, which will be piped and railed to the plants. Input records of the Pajang cement grinding plant are not shown since they will be handled via the port of Pajang.

Table I-1.4-14

Projections of Cement Industry Products Shipped via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Regional Demand</u>	<u>Palembang Production Total</u>	<u>Production Waterborne</u>	<u>Surplus or Deficit</u>	<u>Input Needs</u>	<u>Total Waterborne Shipments</u>
1974	74.5			- 74.5		74.5
1980	172.3	250.0	86.2	+ 77.7	25.0	188.9
1985	344.6	500.0	172.3	+155.4	50.0	377.7
1990	607.0	750.0	303.5	+143.0	75.0	521.5
1995	978.0	1000.0	489.0	+ 22.0	100.0	611.0
2000	1574.0	1500.0	787.0	- 74.0	150.0	863.0

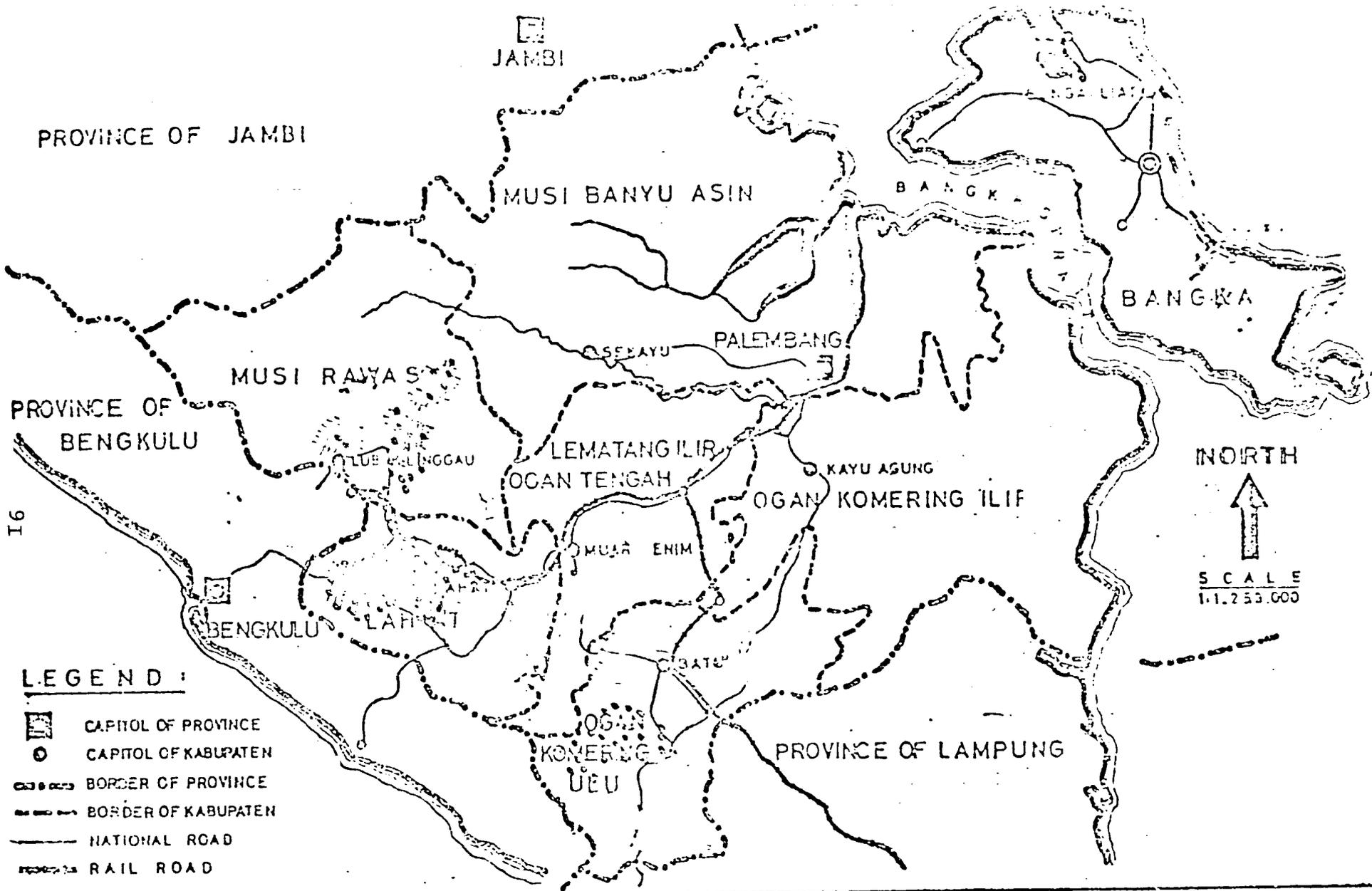


FIGURE I-1.4-4

CRUDE OIL FOUND IN PORT OF PALEMBANG WINTERLAND

SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

TABLE I-1.4-15

PALEMBANG REFINERY OUTPUT IN 1974.

(OOO Barrels)

<u>Products</u>	<u>Volume</u>
Kerosene	11,465
Fuel Oil	6,299
Gasoline	7,784
Gas oil	6,192
Diesel	3,059
Other	2,749
Total	<u>37,548</u>

It has been learned that Pertamina plans to gradually reduce refining operations at Palembang. The current plan is to reduce the output of refined products to meet local demand and convert existing facilities to petrochemical production. This decision was prompted by the following considerations:

(i) The two Palembang refineries, Sei Gerong and Plaju, are old, having been in operation since mid 1950s. Maintenance costs are increasingly high and spare parts are no longer available.

(ii) Only small, expensive tankers can be used for crude and product movements because of the draft and tide limitations. Unit distribution costs are high.

(iii) The unloading capacity in Tg. Priok (Jakarta) oil terminal where most refined products from Palembang are shipped, is about 20,000 tons/day. It is not efficient to use this capacity to unload small tankers from Palembang.\*

(iv) The recently opened Cilicap (Java) refinery is expected to meet local demand at a much lower cost reducing the need for refinery products from Palembang.

#### Projections

The proposed slowdown of refinery operations at Palembang will be reflected initially in the reduction of crude oil shipments by tankers. It is assumed that the share of crude arriving by tanker will represent only 20% of the total by the end of the study period. It is further expected that an increased portion of the refinery output will be consumed locally, thus requiring

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\*Partly for this reason, Pertamina ships crude to a refinery in Singapore where refined products can be loaded on large (20,000 ton) tankers for shipment to Tg. Priok.

Table I-2.4-16

Crude and Oil Product Shipments via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Interisland</u>	<u>Foreign</u>	<u>Total</u>
1969	7744.1	1264.2	9008.3
1970	7941.7	1531.8	9473.5
1971	7428.4	830.0	8258.4
1972	7172.0	703.7	7875.7
1973	8654.7	1007.8	9662.5
1974	6600.0	387.4	6987.4

Table I-1.4-17

Projections of Crude Oil and Oil Product Shipments via Palembang  
(600 Tons)

Year	Unloaded			Inter- Island	Loaded		Total
	Crude	Products	Total		Exports	Total	
1974	2418	96	2514	4212	261	4473	6987
1980	2150	136	2286	4170	300	4470	6756
1985	1880	190	2070	3750	300	4050	6170
1990	1610	268	1878	3380	300	3680	5558
1995	1340	394	1734	3040	300	3340	5074
2000	1080	578	1658	2740	300	3040	4698

less water transport. On the other hand, reduction in the refinery operations will create demand for certain petroleum products not in production or produced in insufficient volume. Finally, exports of paraffin wax and residues will show little change, reflecting the levelling off of the refinery output.

These assumptions are the basis for projections of crude oil and oil product shipments via the port of Palembang presented in Table I-1.4-17. The projections do not include the demand for water transport generated by the proposed petrochemical complex, nor do they comprise non-oil product movements (general cargo) over Pertamina's waterfront facilities.

#### Fertilizers

##### Present Situation

##### Consumption

Urea, phosphate and potash are the principal fertilizer types consumed in Indonesia. Urea demand increased by 15.5% annually during the 1964-74 period. During the same period, phosphate and potash consumption grew at 15.8% and 11.9% per annum respectively. However, fertilizer demand remains at the lowest level for all southeast Asian countries. All three fertilizers are needed in a balanced nutrient level for most effective results. At present, this ratio is highly biased toward locally produced urea, indicating an above average growth demand for both phosphate and potash fertilizer in the years ahead.

Actual demand for fertilizer is distorted by the Government rationing system. If this system is eliminated as a result of the expected increase in fertilizer production, widespread use of fertilizer in agri-

culture should follow.

#### Production and Imports

No fertilizer was produced in Indonesia prior to the start of PUSRI I operations in Palembang in 1964. From 1964 to 1971, PUSRI I was the only domestic fertilizer production facility in the country. In August 1971, Indonesia's second fertilizer facility, P. N. PETROKIMIA Fertilizer Plant at Gresik, East Java, went on stream. Indonesia's third fertilizer plant, PUSRI II, went into production in September 1974 with an annual capacity of 380,000 tons of urea. The country has negligible production capacity for phosphate fertilizers and as there are no known local reserves, no local production facility of potash fertilizer. Total fertilizer production in 1974 was estimated at 318,000 tons including 70,000 tons of ammonium sulfate, and 248,000 tons of urea.

Because of insufficient domestic production, Indonesia imports a substantial volume of fertilizer each year. During 1974, a total of 742,000 tons were imported comprising 505,000 tons of urea, 151,000 tons of TSP/DAP and 86,000 tons of compound fertilizer. Over 1.1 million tons are expected to be imported in 1975.

#### PUSRI Fertilizer Plant

The plant is supplied by natural gas piped from the nearby gas fields and produces only nitrogen fertilizers. Total production reached 191,000 tons in 1974 including 113,500 tons of bagged and 77,500 tons of bulk urea. Of this total, some 135,000 tons were actually distributed to various destinations throughout Indonesia. PUSRI also handled 4,500 tons of imported fertilizer, mostly phosphate and potash

based stock required for a balanced fertilizer product.

Table I-1.4-18 shows the distribution of PUSRI's fertilizer in 1974. Bagged and bulk urea shipments are shown separately. For bulk shipments, all of which were destined for Java, the unloading port is shown.

Urea sales to the project area totaled 6,200 tons in 1974, i.e. less than 4% of the total. The 1975 sales are estimated at 9,000 tons and 12,500 tons are slated for the local market in 1976. All urea for Jambi province and Bangka Island is transported by sea. Urea sold within S. Sumatra is distributed by various transport modes. It should be also noted that urea shipments to the adjacent Lampung province, 9,250 tons in 1974, were made by rail.

#### Projections

##### Indonesia

The potential long-term demand for fertilizer is great. At present, only 30% of total harvested land, mostly rice paddies, is fertilized and there is heavy reliance on nitrogen fertilizers. The government is engaged in an intensive import substitution program aided by the discovery, in recent years, of abundant natural gas reserves from which nitrogen fertilizers are produced. The World Bank projects urea demand at 11.6% annually through 1978 and at 7% thereafter; the annual demand for other fertilizers is expected to grow at 18-26% till 1978, 18.5% between 1978-83 and more slowly thereafter.

Indonesia has firm plans to establish three urea fertilizer plants; PUSRI LII at Palembang, the East Kalimantan Plant I, near Balikpapan, and the West Java Plant at Jatibarang. Under preliminary stages of

Table I-1.4-18

Pusri Urea Shipments in 1974  
(Tons)

<u>Bagged Area</u>		<u>Bulk Area</u>	
<u>Region/Province</u>	<u>Volume</u>	<u>Port</u>	<u>Volume</u>
North Sumatra	1,200	Jakarta	40,639
South Sumatra	6,191	Cilacap	16,440
Lampung	9,350	Surabaya	<u>11,664</u>
West Java	24,720	TOTAL	68,743
Central Java	43,496		
East Java	27,966		
West Kalimantan	<u>3,400</u>		
TOTAL	116,323		

consideration are three more plants: the North Sumatra Plant at Aceh, the East Kalimantan Plant II and another expansion of PUSRI. The following table shows the main units, capacities and the likely dates for full commercial production of the plants to be built before 1980:

<u>New Urea Fertilizer Plants</u>			
	<u>Ammonia Unit Capacity (TPD)</u>	<u>Urea Unit Capacity (TPD)</u>	<u>Commercial Production</u>
PUSRI III	1,000	1,725	May 1, 1977
East Kalimantan I	1,500	1,725	Jan. 1, 1978
West Java	1,000	1,725	Jan. 1, 1979

For the local production of phosphate fertilizers, Indonesia plans to build a TSP plant as part of the PETROKIMIA complex. This plant is expected to go into production on January 1, 1977, with an annual capacity of about 300,000 tons of TSP. The country has no plans for local production of potash and compound fertilizers.

If present programs for expanding fertilizer production are implemented as planned, the annual production of urea is projected to increase to 2.0 million tons, creating temporary export surpluses.

#### PUSRI

Stages I and II of PUSRI's fertilizer complex are already operational with a rated annual capacity of 480,000 tons of urea. The completion of the PUSRI III fertilizer plant, presently under construction, is expected in 1977 and will increase the productive capacity by 570,000 tons. Another 500,000 tons of annual capacity will be added when PUSRI IV is built around 1980. According to PUSRI management, there are definite economic advantages (including raw materials,

skilled labor and infrastructure) to justify future expansion of productive facilities at the same location.\*

There are no specific plans for additional productive facilities at PUSRI beyond PUSRI IV, but the highly successful operations to date and the heavy investments in a PUSRI-based fertilizer distribution network indicate the likelihood of further growth.

As mentioned earlier, present fertilizer consumption is imbalanced in relation to its optional nutrient value. Rapid growth in imported phosphate and potash deposits is expected, although an increased part of phosphate fertilizer will be processed in Indonesia. The PUSRI fertilizer complex will import or transship from other islands substantial volume of non-urea fertilizers for preparation and distribution. This study assumes that the nutrient balance in fertilizer distributed by PUSRI will be reached in 1990 and maintained thereafter.

Estimates of PUSRI I, II and III fertilizer distribution in the near-term future were prepared in a recent study from which information is presented in Table I-1.4-19. According to this source, most shipments will continue to go to Java but its share of the total will gradually decline.

If PUSRI IV and other fertilizer projects are constructed as scheduled, there will be a temporary period, around 1980-1985, when domestic production will surpass the absorptive capacity, creating export

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\*In the wake of Pertamina's recent financial difficulties some of its fertilizers projects had been turned over to PUSRI, increasing the probability of further expansion of productive facilities at Palembang.

Table I-1.4-19

Distribution of Fertilizers From Pusri in 1978  
(000 Tons)

<u>Destination</u>	<u>Urea</u>	<u>Other</u>	<u>Total</u>
Java	746	259	1,005
Sumatra	200	71	271
Sulawesi	47	17	64
Bali	29	10	39
Kalimantan	35	13	48
Other	3	1	4
TOTAL	<u>1,060</u>	<u>371</u>	<u>1,431</u>

surpluses. Most urea exports during that period will probably go to other ASEAN countries including Thailand and the Philippines.

Urea sales in the project area are expected to rise to 12,000 tons in 1976. Fertilizer will be sold at subsidized prices only to the farmers and estates participating in the intensification program.\* Additional demand will be generated by the Pertamina Pice estate now under construction.

The various developments expected to affect fertilizer production, consumption, exports and imports in Indonesia and the project area have been described above. The projections of fertilizer shipments via the port of Palembang based on and derived from these considerations are presented in Table I-1.4-20. They represent no more than the best judgments of an admittedly fluid situation.\*\* It should be noted, however, that fertilizer shipments and receipts in Palembang will be handled by PUSRI's own port facilities, and concern the port development primarily through PUSRI's demand for waterfront facilities within the port area and the effect PUSRI ships may have on MUSI river traffic and dredging needs.

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\*It is estimated that unrestricted sales at subsidized prices and accompanied by farmer training could reach 200,000 tons annually.

\*\*The uncertainty created by Pertamina's tribulations, the overproduction and excessive imports in 1975, and the government control of the market through allocations and subsidies are some of these problems.

Table I-1.4-2C

Fertilizer Shipments via Palembang  
(000 Tons)

<u>Year</u>	<u>Exports</u>	<u>Imports</u>	<u>Inter- Island</u>	<u>Local</u>	<u>Total</u>
1974	-	4.5	175.2	4.0	183.7
1980	311.0	96.0	737.0	8.0	1152.0
1985	7.0	187.0	1409.0	16.0	1619.0
1990	-	309.0	1622.0	32.0	2163.0
1995	-	461.0	2242.0	64.0	2767.0
2000	-	708.0	2720.0	133.0	3561.0

## Rubber

### Present Situation

The port of Palembang is a major center for raw rubber exports. Raw rubber is also brought in for processing in Palembang's tire factory.\* Each is considered separately below.

#### Raw Rubber Exports

Rubber is grown throughout the port hinterland as shown in Figure I-1.4-3. Most rubber is produced by small holders; large estates contributed less than 2% of 149,000 tons exported from South Sumatra in 1974. Rubber exports from the area grew more slowly in the more recent period despite stagnation in rubber shipments elsewhere in Indonesia.

#### Local Demand

The principal source of local demand for rubber is the Palembang tire factory. The factory was completed in 1969 and produces mostly motor vehicle tires and tubes. Table I-1.4-22 shows the plant's output, national production and imports of tires and tubes in recent years. No information is available on total raw rubber requirements of the Palembang tire factory. Waterborne deliveries, however, were estimated at 1,850 tons in 1974.

### Projections

#### Raw Rubber Exports

Rubber exports from Indonesia stagnated in recent years due to the lack of diversified markets, competition from synthetic rubber and, more recently, economic recession in the West. Despite this, exports from South Sumatra grew at 6% p.a during the 1969-74 period, as

\*Waterborne shipments of tires and tubes are included in general cargo estimates.

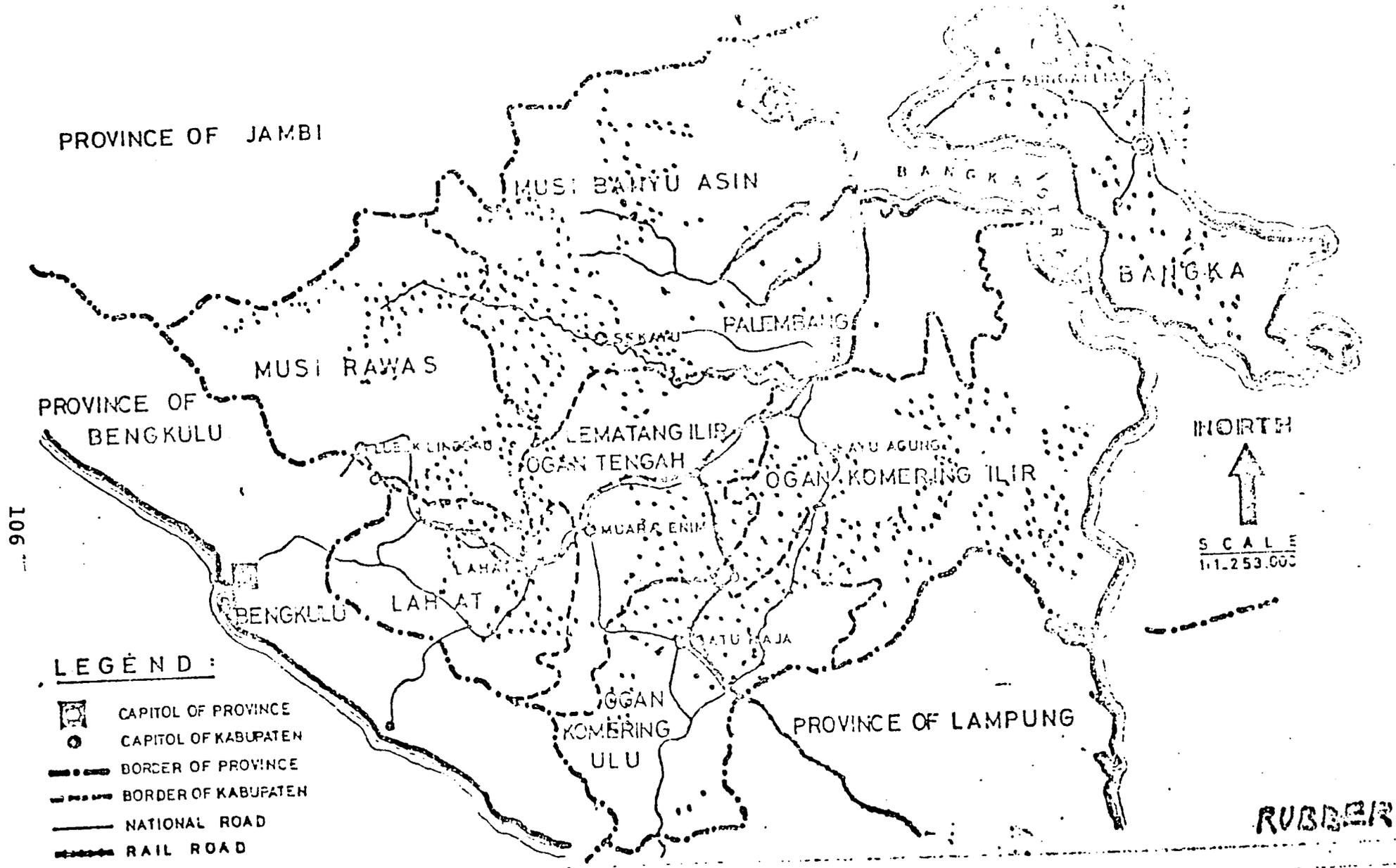


FIGURE I-1.4-3

RUBBER PRODUCTION IN PALEMBANG HINTERLAND

SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

Table I-1.4-21

Raw Rubber Exports from South Sumatra  
(000 Tons)

<u>Year</u>	<u>Smallholders</u>	<u>Estates</u>	<u>Total</u>
1964	69.0	2.1	71.1
1969	112.2	1.6	113.8
1974	150.3	2.0	152.3

shown in Table I-1.4-21.

The outlook for the immediate future is encouraging. The sharply higher cost of synthetic rubber (based on oil products) reduced its competitive threat, while the active effort to open new markets in socialist countries begins to show results. Furthermore, the rebound of the automobile industry in USA and Western Europe should be followed by increased demand for natural rubber.

In the long run, world demand for rubber is projected to grow at about 6%. Until recently an increasing portion was supplied by synthetic rubber, but the balance has now changed in favor of natural rubber. According to WB forecasts, an average annual growth of 5.0 - 5.5% can be expected in the foreseeable future.

In Indonesia, the planned emphasis will be on small-holder rubber growth which predominates in the project area. Accordingly, it is assumed that rubber exports from the project area will grow at 6% during the period under review.

#### Local Demand

Raw rubber is also shipped to Palembang for tire and tube manufacturing. The tire industry depends on the growth of the number of motor vehicles in Indonesia, which expanded by 14% annually in recent years. An additional source of growth is import substitution. An annual growth of 10% in raw rubber requirements is likely through 1985 followed by gradually lower growth rates thereafter.

#### Raw Rubber Shipment Projections

Estimates of future raw rubber shipments via the project port are summarized in Table I-1.4-23. These

Table I-1.4-72

Tire and Tube Production and Demand in Indonesia  
(000 Pieces)

Year	Production				Imports		Demand	
	Tires		Tubes		Tires	Tubes	Tires	Tubes
	Indonesia	Palembang	Indonesia	Palembang				
1968	n.a.	n.a.	n.a.	n.a.	372.0	283.0	n.a.	n.a.
1970	400.0	6.5	236.6	-	n.a.	n.a.	n.a.	n.a.
1971	508.0	11.5	270.6	10.6	826.0	821.0	1334.0	1091.6
1972	857.5	48.7	407.0	45.2	634.0	658.0	1491.0	1065.0
1973	1351.4	136.8	829.0	129.1	755.0	470.0	2106.4	1059.0

Table I-1.4-23

Raw Rubber Shipments via Port of Palembang

<u>Year</u>	<u>Exports</u>	<u>Local Demand</u>	<u>Total</u>
1974	149.1	1.9	151.0
1980	211.3	3.3	214.6
1985	282.7	5.3	288.0
1990	378.3	7.8	386.1
1995	482.7	10.4	493.1
2000	616.0	12.6	628.6

projections are based on the existing port hinterland and do not consider the possible diversion to Palembang of raw rubber presently exported via the port of Jambi (91,000 tons in 1974). The proposed improvement of the Palembang - Jambi road would result in partial diversion because of draft limitations and inefficient operations in the port of Jambi.

### Coffee

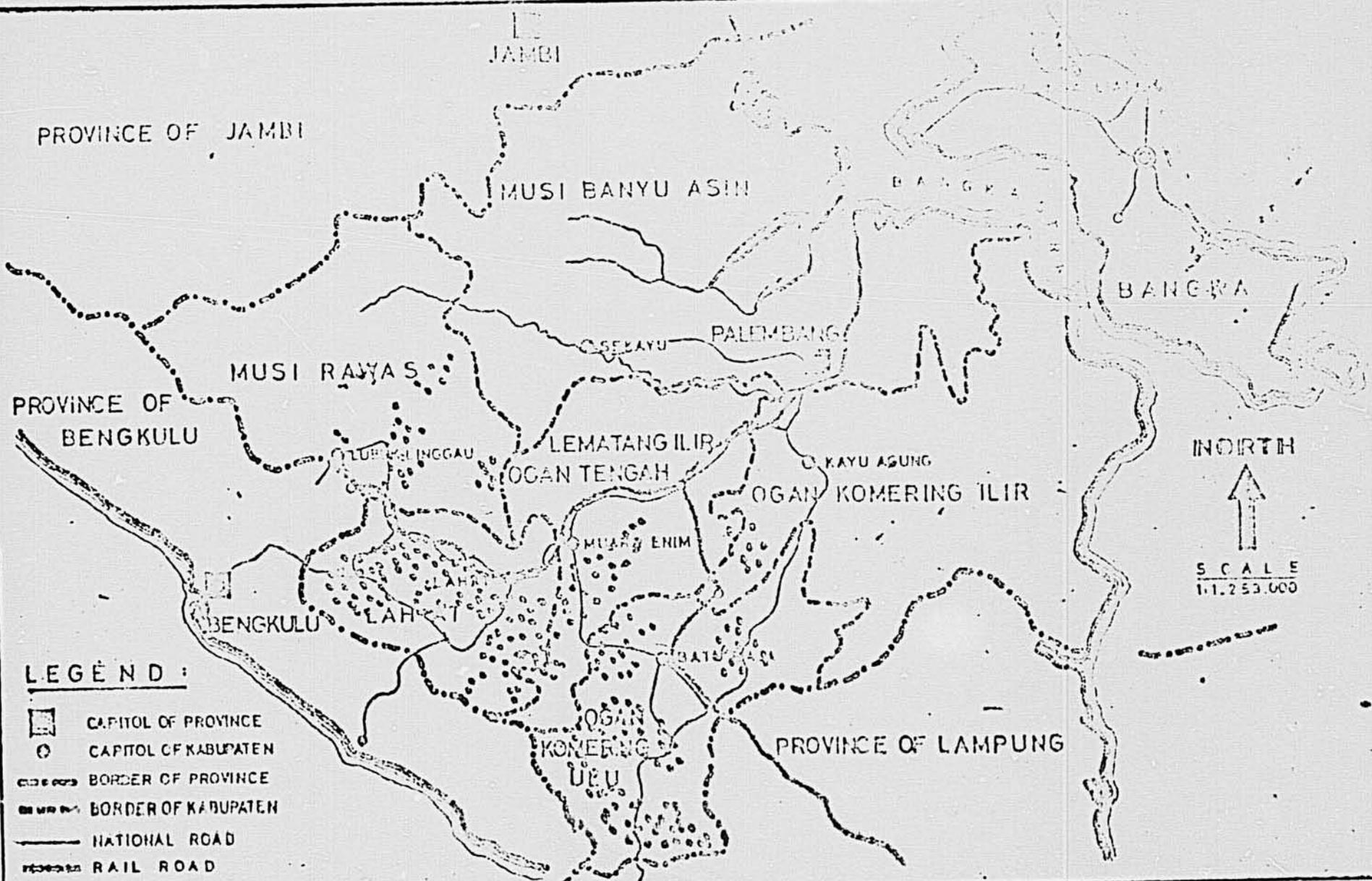
#### Present Situation

Coffee is grown primarily for export in the southern sections of the project area as shown on Figure I-1.4-4. A small portion of coffee output is shipped to other parts of Indonesia for domestic use and/or transshipment. The port of Palembang also handles coffee grown in the adjacent province of Bengkulu.

#### Projections

South Sumatra produces a large volume of coffee annually - about 475,000 tons in 1974, but exports only a small portion of the total due, in part, to poor quality standards. As a result, coffee exports remained depressed in recent years, except in 1974 when the sales to non-quota countries helped boost the export volumes.

The outlook for coffee exports is encouraging for the following reasons: Indonesia's sales to the conference members remains below the quota; the potential coffee sales to the non-quota countries have been explored only recently; the recently signed international coffee agreement is aimed to stimulate coffee production; the government is studying the possibility of formulating quality standards for coffee exports. It seems reasonable, therefore, to assume that the



- LEGEND :**
- CAPITOL OF PROVINCE
  - CAPITOL OF KABUPATEN
  - BORDER OF PROVINCE
  - - - - - BORDER OF KABUPATEN
  - NATIONAL ROAD
  - RAIL ROAD

FIGURE I-1.4-4

RUBBER PRODUCTION IN PORT OF PALEMBANG HINTERLAND

SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

Indonesian coffee exports will exceed the world demand initially, and approximate it in the later part of the period under review. Coffee projections are shown in Table I-1.4-24.

### Coal

#### Present Situation

The existing coal mine in the port hinterland is located at Bukit Asan, 164 km. inland by rail from the port of Palembang. The mine produced about 80,000 tons of coal in 1974, up nearly 20% from 1973, but only a fraction of the 550,000 tons mined in 1960. Increasing competition from oil, the low quality of the coal itself (lignite) and antiquated and inefficient mining equipment have been the principal factors behind the decline in production and shipments in recent years. The major coal users are the railroad, the electric power plant and the tin smelter on the Bangka Island. Coal for the latter is barged from the railway pier in the port of Palembang.

#### Projections

Following the recent increases in the price of oil, there has been renewed interest in coal mining in Indonesia and the project area. The two projects under study in South Sumatra include: (a) expansion of existing coal mining facilities to an annual production level of about 2 million tons and, (b) construction of new coal mining facilities with an annual production volume of 20-25 million tons. Each project and its relation to the project port are briefly described below.

#### Rehabilitation of Existing Facilities

The proposed rehabilitation and expansion of coal

Table I-1.1-24

Coffee Shipments Via Port of Palembang

<u>Year</u>	<u>Volume</u>
1974	41.0
1980	52.2
1985	60.7
1990	70.5
1995	78.0
2000	86.4

facilities at Bukit Asam anticipate an increase in coal output from 80,000 tons in 1974 to nearly 1.9 million tons in 1984. Table I-1.4-25 based on a recent market study, shows that most coal will be used to meet Indonesia's growing energy demand.

To cope with the rapid industrial and urban development, recent surveys found that the country will require 64,000 megawatts of installed capacity by the year 2000, equivalent to an annual growth rate of over 12%. To meet these needs, the government is seriously considering doubling Indonesia's energy output every Repelita (Five Year Development Plan).

The Bukit Asam coal mine will supply coal of good thermal quality to the power plants in Sumatra and Java. Shipments to Java will be made initially via the port of Palembang. As the volume of interisland coal shipments grows, it is conceivable that it may become more economical to divert to a bulk facility that will be constructed in Semangka Bay for coal exports. (See below) However, this diversion will be limited by a short sailing distance, longer land transport and lack of bulk cargo ports in Java for unloading coal from Sumatra.

The only source of coal demand requiring port facilities at Palembang will be the tin smelter at Bangka Island. Its requirements have been estimated at 70,000 tons annually through 1984, reflecting the ongoing program for expansion of tin smelting facilities. Further expansion of tin smelting facilities is likely between 1985 and 2000.

Table I-1.4-26 summarizes projection of coal ship-

Table I-1.4-25

Projections of Coal Demand from Bukit Asam Mine  
(000 Tons)

	1976	1977	1978	1979	1980	1981	1982	1983	1984
Railways	50	50	50	50	50	50	40	30	15
P.N. Timah (Bangka) Tin Smelter	70	70	70	70	70	70	70	70	70
Saturaja Cement Plant Stage I	--	--	100	150	150	150	150	150	150
Saturaja Cement Plant Stage II	--	--	--	--	100	150	150	150	150
Minesmouth Power	--	--	--	150	300	300	450	450	600
Other Sumatra Power (e.g. Tl. Batang)	--	--	--	--	150	150	225	225	300
PLN I (Java)	--	--	--	--	100	300	300	300	300
PLN II/Industry (Java)	--	--	--	--	--	100	100	200	200
Own Use	40	40	50	50	50	50	50	50	50
Sub Total	160	160	270	470	970	1320	1535	1625	1835
Stockbuild	20	20	25	50	100	90	50	25	50
Production Target	180	180	295	520	1070	1410	1585	1650	1885

Table I-1.4-26

Projected Coal Shipments Via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Java</u>	<u>Bangka Island</u>	<u>Total</u>
1974	1	28	29
1980	100	70	170
1985	680	70	750
1990	900	70	970
1995	970	100	1070
2000	720	100	820

ments via Palembang, taking into account the possibility of partial diversion of bulk coal movements to another deep water port.

#### Coal Exports

The Government has agreed with the Shell Group to develop large scale coal deposits in South Sumatra. Already completed surveys show that the low-sulphur export quality, "steam" coal deposit at Bukit Asam, is one of the biggest in the world. It is now estimated that the annual production from this area can reach 20-25 million tons a year by mid-1980s.

While the entire project is still in an early planning and exploration stage, it is expected that coal will be transported by rail or a slurry pipeline to a new deep water port to be constructed in the Sunda Strait away from the project area. Consequently, there will be no direct impact on the project port, except for the partial diversion from Palembang of coal traffic described above.

#### Salt

##### Present Situation

Palembang is a major regional distribution center of salt for human consumption. Most salt consumed in the project area originates in Madura (Timur), but some is also imported from India. The principal inland markets aside from Palembang include Baturaja and Lubinklingau; smaller volumes are distributed throughout the countryside. All salt arrives in Palembang by sea but only 20% of secondary distribution is estimated by water transport.

The principal importer of salt for local distribution is P.N. Garam, a national government agency with

its own facilities for unloading and storing. Aside from P.N. Garam, salt is brought in by the South Sumatra government importing agency and by at least one private trading company and unloaded in the port area. Of the nearly 19,000 tons of salt unloaded in 1974, some 10,000 were on account of P.N. Garam.

#### Projections

Human demand for salt is income inelastic; i.e. it is proportional only to the population growth. There is no industrial demand for salt at present, but it is expected to materialize in connection with the proposed petrochemical complex. Only the human consumption demand for salt is projected here and shown in Table I-1.4-27; industrial uses are discussed elsewhere in the study. Secondary distribution of sale by water transport is estimated as part of general cargo movements.

#### Timber and Products

##### Present Situation

Indonesia is the world's principal supplier of tropical hardwood. The easing of timber concession and logging operation requirements accelerated the log production and export in the early 1970s. The worldwide economic recession halted the expansion in 1974 and 1975, but the worst appears to be over. Despite the government efforts to promote the export of sawn timber, it accounts for only 2% of total timber exports as shown in Table I-1.4-28. Domestic demand for timber is, at 600,000 m<sup>3</sup>, relatively small and concentrated on the island of Java.

Sumatra, including the port hinterland, represents a major timber resource region. Table I-1.4-29 and Figure I-1.4-5 give information on the region's forest, but

Table I-1.4-27

Salt Shipments Via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Volume</u>
1974	18.7
1980	21.7
1985	24.4
1990	27.3
1995	30.5
2000	33.8

Table I-1.4-28

Timber Production and Exports from Indonesia

1970 - 1974

(000 m<sup>3</sup>)

Year	Log Production	Export	
		Log	Sawn
1970	10,221	7,350	62.7
1971	13,489	10,761	80.7
1972	17,286	13,890	132.2
1973	25,348	19,488	337.9
1974*	25,000	18,800	400.0

\*Preliminary

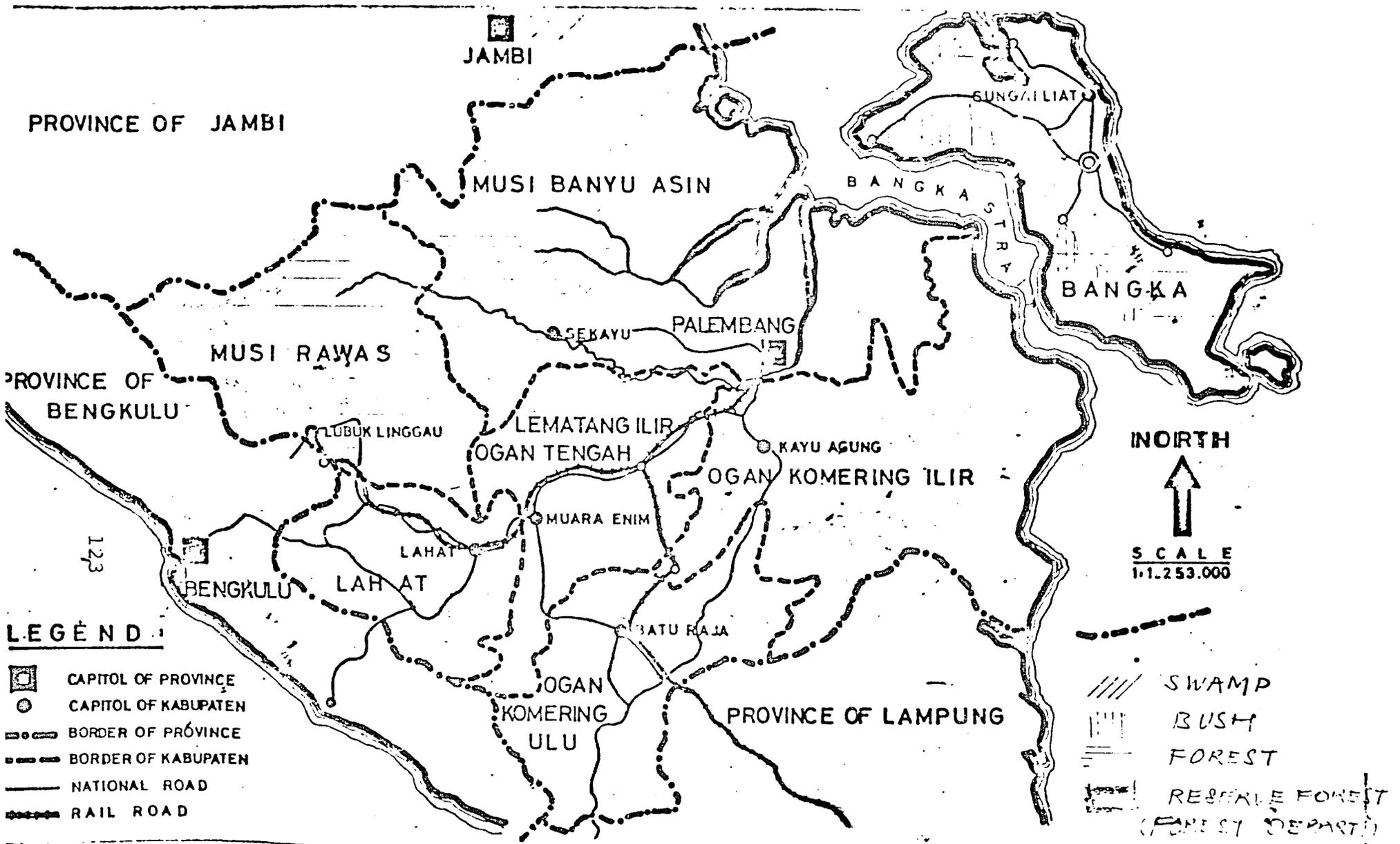
Table I-1.4-29

Timber Reserves, Production and Exports from  
Southern Sumatra in 1974

(000 m<sup>3</sup>)

Region	Commercial Forest Area (000 HA)	Production	Exports
S. Sumatra	2,878	992.5	685.0
W. Sumatra	999	n.a.	205.6
Bengkulu	660	6.1	-
Jambi	2,915	625.5	628.0
Lampung	781	180.0	n.a.
TOTAL	8,233	n.a.	n.a.

Figure I-1.4-5  
Region Forest Reserves



SOURCE : DEPARTMENT OF PUBLIC WORKS (BINA MARGA)

there are substantial local and interisland shipments of sawn timber from Palembang. Also located in the Palembang area since mid 1974 is one of Indonesia's five plywood factories producing for the Jakarta market. Only a portion of timber export from port hinterland passes through the port of Palembang as shown in Table I-1.4-30.

#### Projections

Separate projections have been prepared for exports (logs and sawn timber) and for domestic shipments (sawn timber and timber products). They are described below and summarized in Table I-1.4-31.

#### Exports

Only logs are exported at present, primarily to Japan. Discounting the temporary setback in timber exports, the long term world demand for tropical hardwoods is excellent because a chronic shortage is expected.\* During the last few years, the Government has sought to promote sawn timber exports as a means of establishing a domestic timber processing industry. As shown in Table I-1.4-31 only limited progress has been made to date. The eventual implementation of this policy objective will require construction and the modernization of existing timber processing facilities.

This will take time, but should not affect the aggregate demand for Indonesia's timber. Actually, Indonesian timber exports should increase in the world market because no serious effort has been made to date to explore new markets. Sumatra's timber

\*Under the UNCTAD generalized Preference Scheme, Japan halved the duties on many types of tropical hardwood and hardwood products from the less developed countries.

Table I-1.4-30

Log Shipments from South Sumatra in 1974

(000 m<sup>3</sup>)

<u>Point of Shipment</u>	<u>Volume</u>
Pulau Burung	309.4
Banuyasin	204.2
Palembang	92.8
Mesuji	<u>12.4</u>
TOTAL	<u>618.3</u>

Table I-1.4-31

Timber Shipments via Port of Palembang

---(000 tons)

Year	Logs	Sawn Timber			Timber Products (000 tons)
		Exports	Domestic	Total	
1974	618.8	--	34.4	34.4	3.0
1980	1041.0	55.0	118.0	173.0	153.7
1985	1450.0	160.0	238.0	398.0	245.6
1990	2010.0	355.0	460.0	815.0	393.4
1995	2532.0	633.0	789.0	1422.0	575.9
2000	3176.0	1058.0	1325.0	2383.0	742.9

resources have the further advantages of easy access and low cost river transport, relatively uniform hardwood species mixture and a high volume of marketable timber per unit of area.

In this study, overall foreign demand for Sumatra's timber is expected to grow at 10% annually through 1980 and at slowly declining rates thereafter. The share of sawn timber exports will rise from about 5% in 1980 to at least 25% by the end of the forecast period. Log exports will continue to be shipped mostly from the coastal areas, but sawn timber shipments will probably originate in the Palembang region.

#### Domestic Market

South Sumatra already ships sawn timber and plywood sheets to Java. At present, the province supplies less than 5% of Java's timber needs, in part because Java's own timber resources are being used up first. However, the proximity of Jakarta, the principal domestic market for sawn timber and wood products, guarantees continued demand for the area's timber.

It is expected that Java's demand for sawn timber will grow at 12% annually till 1980, but will taper off in the more distant future. At the same time, South Sumatra's share of the Java timber market will gradually increase as Java's timber resources become depleted and forest areas are converted to agricultural use.

In addition to sawn timber, the volume of timber products shipped by South Sumatra to Java and other parts of Indonesia is expected to increase. The existing plywood factory, scheduled to triple its output before 1980, already ships nearly 90% of its output

to Jakarta. Other timber-based industries in the port hinterland are in various planning stages. It is expected that the growth of domestic demand for timber products will approximate that of sawn timber, but that local consumption, not requiring water transport, will represent an increasing portion of total output during the period under review.

### Coconut Oil

#### Present Situation

Coconut oil is shipped to the Palembang area for consumption and processing from the nearby Riau province in Sumatra. Nearly 15,000 tons was unloaded in the Boom Baru terminal in 1974. Coconut oil is also produced in the port hinterland but not in sufficient volume to meet the rapidly growing urban demand in the Palembang area.

#### Projections

The human consumption of fats and oils (including coconut oil) is income elastic at lower income levels. The present per capita consumption in Indonesia and the project area is, at 7 kg. annually, much lower than in other parts of southeast Asia. It is, therefore, expected that the demand for coconut oil should increase sharply in the near term future and more slowly thereafter. Coconut oil projections are presented in Table I-1.4-32.

### Petrochemicals

#### Present Situation

The present per capita consumption of plastics and synthetic fibres in Indonesia is among the lowest

in the world.\* Aside from the urea fertilizer plants and a small (annual capacity 20,000 tons) polypropylene plant at Palembang, there is no domestic petrochemical industry. Three small PVC plants with a total annual capacity of 42,000 tons were under construction in Java in 1975. A national petrochemical survey carried out in 1973-74 by a Japanese consulting firm identified a substantial existing demand for petrochemical industry products illustrated in table T-1.4-33.\*\*

#### Projections

Recent World Bank estimates show the gross value added by the petrochemical industry rising from Rp. billion 0.1 in 1973 to Rp. billion 94.8 in 1985 in constant Rupiahs. The Japanese study of domestic demand indicates average annual growth rates for the 1972-85 period ranging from 10-26% for plastics and 12-15% for synthetic fibers. The study also projects foreign demand for petrochemicals produced in Indonesia.

To meet this demand, the Indonesian Government plans to accelerate large scale development of the domestic petrochemical industry. While the decision on specific projects has been delayed by recent liquidity problems in Pertamina, the economics of the petrochemical industry require a minimum size plant with an annual output of about 300,000 tons of petrochemical base materials (PEM).

This study assumes that a petrochemical complex ~~WTO illustrate~~, the per capita demand for synthetic fibers in 1972 was 0.8 kg in Indonesia compared with 2.4 kg in Hong Kong and Thailand.

\*\*Japan Gasoline Co., Survey of the Petrochemical Industry in Indonesia, Tokyo, April 1973.

Table I-1.4-32

Coconut Oil Shipments via Port of Palembang  
(000 Tons)

<u>Year</u>	<u>Volume</u>
1974	16.7
1980	22.4
1985	28.5
1990	36.4
1995	44.3
2000	53.8

Table I-1.1-33

Demand for Petrochemical Industry Products  
in Indonesia in 1972

(000 Tons)

Plastics

Houshold articles	18.0
Footweat	10.0
Film and Sheets	40.5
Construction	2.7
Industrial	1.5

Total 72.7

Synthetic Fibres 98.5

Grand Total 171.2

with an annual rated capacity of 300,000 tons of PBM will be constructed in Palembang and commence production by 1985.\* This capacity will be subsequently enlarged to meet the projected growth in domestic demand for petrochemical products.

This new petrochemical complex will require an annual input of 400,000 tons of naptha, and 40-50,000 tons of other raw materials, primarily chlorine.\*\* Naptha is a byproduct of the refining process and, in Palembang, accounts for only 8-10% of the refinery output. Since the oil refinery output is expected to stagnate, the naptha will have to be shipped in, probably from the Middle East.

The projected output will consist initially of petrochemical base materials. However, it is expected that gradually petrochemical-based industries will be established in the Palembang area, and that finished and semifinished plastic and synthetic fiber products will be an increasing portion of the output.

Table I-1.4-34 presents projections of seaborne transport requirements of the proposed petrochemical complex at Palembang. The estimate of principal input needs and output categories are shown separately.

~~The aggregate domestic demand for petrochemical products in 1985 is estimated at 1 million tons.~~

\*\*Naptha or natural gas are the two basic materials for the petrochemical industry. Of the two, naptha is more versatile with regard to the type of petrochemicals which can be derived from it. The output of natural gas has been reserved for future needs of the PUSRI urea fertilizer complex.

## General Cargo\*

### Present Situation

The port of Palembang is an important trading and distribution center for imported and domestic general cargo commodities in South Sumatra. General cargo flows through the port totalled over 215,000 tons in 1974 including estimated volume handled over private facilities. According to the port sources, most commodities in this group are imported consumer goods including food, textiles, newsprint, etc. A significant portion of the total volume is represented by general cargo brought in directly by PUSRI and PERTAMINA and handled over their own facilities. There is also a substantial volume of general cargo transshipments for nearby islands, coastal zones and river areas, and some general cargo exports.

### Projections

Demand for consumer goods is largely a function of population, per capita income growth and the income elasticity of this demand. A positive elasticity implies that the demand for consumer goods rises faster than the disposable personal income.

The population growth forecasts developed in Chapter II, estimated an annual population growth of 2.5% gradually declining to 2.1% by the end of the study period. No income growth estimates are available on a regional or local level. The perspective national development plan seeks to increase real income by 6.0% annually. The performance record to date is favorable

\*General Cargo as defined here is a residual category including many finished and semifinished products which move through the port in too small quantities or too sporadically to merit individual projections.

Table I-1.4-34

Projected Petrochemical Industry Seaborne  
Transport Movements at Palembang  
(000 Tons)

Year	Inputs		Output		Total
	Naptha	Other	PBI	Products	
1974	-	-	-	-	-
1980	-	-	-	-	-
1985	400.0	44.0	240.0	48.0	732.0
1990	670.0	70.0	340.0	110.0	1190.0
1995	1120.0	120.0	470.0	220.0	1930.0
2000	1840.0	190.0	630.0	420.0	3080.0

and it is assumed that the income will, in fact, increase at this rate during the period under review. Per capita income growth is derived from the population and income growth estimates.

Two means of estimating the relationship between income and income elasticity of demand for consumer goods are currently in use: time series data and cross-sectional surveys which provide a picture of personal expenditures for various goods and services at a single point in time. In Sumatra no reliable time-series data exist for demand for consumer goods, but the Sumatra Personal Expenditure Survey for 1971-72 does provide suitable cross-sectional data.\*

The principal reason for using personal expenditure figures is to make predictions about the behavior of consumers as their incomes change over time. The assumption is made that as their circumstances change, individuals will behave in a manner similar to other individuals already in such circumstances at the time of the cross-sectional survey.

The use of these figures depends on the simplifying assumption that personal demand for consumer goods is determined by income alone. Normally, there are other independent variables such as holdings of liquid assets, prices, etc.; but these variables are not individually considered in this study.

Table I-1.4-35 illustrates the effect of rising income on selected consumer goods expenditures in Sumatra. The average annual per capita income was Rp. 18,000 in 1971-72. Growing at an average annual rate

\*University of Bonn, Sumatra Regional Planning Study: Pattern of Yearly Expenditure Per Capita, Bonn, 1973.

Relation of Selected Consumer Goods Expenditures  
To Total Personal Expenditures in Sumatra in 1971/72  
(Rupiah per Annum)

Individuals with Annual Expenditures		Selected Consumer Goods Expenditures							Total
		Milk & Products	Cloth	House- Hold	Hygiene	Techni- cal Goods	Educ- ational	Misc.	
Range	Average								
Under 10,000	7452	-	287	355	359	4	245	4	1254
10,000 - 14,999	12646	62	549	542	564	23	407	-	2147
15,000 - 19,999	17605	156	1006	767	767	59	669	9	3424
20,000 - 24,999	22657	262	1007	946	1126	106	751	10	4208
25,000 - 29,999	27116	415	1765	1115	1206	297	1247	18	6066
30,000 - 34,999	32030	636	2555	1523	1532	214	1507	129	8095
35,000 - 49,999	41889	1107	3626	2693	2525	1334	1259	77	12621
Above 50,000	74095	1293	4869	3121	2474	9414	2708	2258	26143

of about 3.0%, real per capita income is expected to reach Rp. 42,000 by the end of the review period. Because of the greater proportion of total income spent on manufacturers and imported foods by higher income individuals, it is estimated that average personal consumer expenditures on these products will more than triple during the same period.

The resulting income elasticity of demand for consumer products for these two income groups is, therefore, estimated at about 1.5:1. Since the regional income is expected to grow at about 6% p.a., the effective demand growth for such products would be about 9.0% p.a.

This demand is estimated for consumer goods presently not produced in the project area. It is, however, to be expected that in time an increased part of goods now imported or produced elsewhere in Indonesia will be manufactured locally, and, therefore, not require water transport. Projections of general cargo movements adjusted for locally produced manufactures are presented in Table I-1.4-36. Also shown in the Table are the estimates of general cargo exports. These exports relatively insignificant at present, should grow as the Palembang's agro-industrial base expands. It is probably reasonable to assume that in the long run, Palembang's manufactured exports will approximate the growth of world trade in manufactures, estimated in various recent studies at 6% p.a.

#### Summary - Port Cargo Projections

Projections of commodity flows through the port of Palembang are summarized in Table I-1.4-37 and Table I-1.4-38 show foreign trade movements.

Table 13.4.3

General Cargo Shipments Via Palembang  
(000 Tons)

Year	F o r e i g n			D o m e s t i c			Total
	Imports	Exports	Total	Loaded	Unloaded	Total	
1974	82.9	9.2	92.1	25.9	97.5	123.4	215.5
1980	138.4	13.0	151.4	43.3	165.8	206.1	357.5
1985	209.0	17.5	226.5	65.4	250.4	315.8	542.3
1990	313.5	23.4	336.9	98.1	375.6	473.7	810.6
1995	457.7	31.3	489.0	143.2	548.4	691.6	1180.6
2000	663.7	41.8	705.5	207.6	795.2	1002.8	1780.3

Domestic cargo movements combining interisland, local and sailing ship traffic, are shown in Tables I-1.4-39 and I-1.4-40. All cargo traffic flows through the port have been aggregated in Table I-1.4-41.

These estimates show that the port cargo will more than double during the period under review. Cargo movements of Pertamina's refinery and petrochemical operations will continue to dominate port activities. Other major commodity flows will be generated by expanded fertilizer production and shipments. Timber shipments will also grow substantially and there will be a rapid expansion of cement industry and coal shipments.

As mentioned earlier, port cargo projections presented herein are based on the estimates of economic activities in Indonesia and the project area. They also presuppose the availability of port facilities to handle increasing volume of port cargo.

Table I-1.4-37

Port of Palembang Import Projections  
(000 Tons)

Import	1974	1980	1985	1990	1995	2000
Fertilizer	4.5	96.0	187.0	309.0	461.0	708.0
Rice	68.2	115.5	121.5	127.5	137.3	141.8
Sugar	8.6	14.5	21.6	24.0	23.1	26.5
Wheat and Flour	1.4	2.0	2.5	3.0	3.5	3.9
Cotton	3.4	5.6	6.9	8.9	10.6	11.9
Inputs for cement manufactures	74.5	25.0	50.0	75.0	100.0	224.0
Naphta	--	--	400.0	670.0	1120.0	1840.0
Oil Products	96.0	136.0	190.0	268.0	394.0	578.0
General Cargo	82.9	138.4	209.0	313.5	457.7	663.7
TOTAL IMPORTS	339.5	533.0	1163.0	1798.9	2717.2	4198.8

Table I-1.4-38

Port of Palembang Export Projections  
(000 Tons)

Export	1974	1980	1985	1990	1995	2000
Fertilizer	--	311.0	70	--	--	--
Rubber	149.0	211.3	282.7	378.3	482.7	616.0
Coffee	39.5	50.0	57.9	67.1	74.1	81.8
Oil Products crude	261.0	300.0	300.0	300.0	300.0	300.0
Logs	618.8	1041.0	1450.0	2010.0	2532.0	3176.0
Sawn Timber	--	55.0	160.0	355.0	633.0	1058.0
General Cargo	9.2	13.0	17.5	23.4	31.3	41.8
TOTAL EXPORTS*	458.7	885.3	659.1	768.8	888.1	1039.6

\*Excludes Logs and Sawn Timber.

Table I-1.4-39

Projections of Unloaded Domestic Cargo at Palembang  
(000 Tons)

Cargo	1974	1980	1985	1990	1995	2000
Salt	18.7	21.7	24.4	27.3	30.5	33.8
Coconut and Oil	16.7	22.4	28.5	36.4	44.3	53.8
Rubber	1.9	3.3	5.3	7.8	10.4	12.6
Coffee	1.6	2.2	2.8	3.4	3.9	4.6
Petrochemicals	--	--	44.0	70.0	120.0	190.0
General Cargo	97.5	165.8	250.4	375.6	548.4	795.2
Rice	22.7	38.5	40.5	42.5	45.7	47.2
Sugar	34.4	57.9	86.4	96.0	92.5	106.1
Wheat & Flour	12.4	17.5	22.4	27.4	31.7	34.9
Crude	2418.0	2150.0	1880.0	1610.0	1340.0	1080.0
TOTAL	2623.9	2479.3	2376.2	2296.4	2267.4	2358.2

Table I-1.4-40

Projections of Domestic Cargo Loaded at Palembang  
(000 Tons)

Cargo	1974	1980	1985	1990	1995	2000
Fertilizer PUSRI	174.7	659.0	1238.0	1545.0	1845.0	2145.0
Fertilizer TRANSSH	4.5	96.0	187.0	309.0	461.0	708.0
Cement	--	163.9	327.7	446.5	511.0	787.0
Petrochemical Base Materials	--	--	240.0	340.0	470.0	630.0
Petrochemical Products	--	--	48.0	110.0	220.0	420.0
Oil Products	4212.0	4170.0	3750.0	3380.0	3040.0	2140.0
Sawn Timber (000 m <sup>3</sup> )	26.4	118.0	238.0	460.0	789.0	1325.0
Timber Products	3.0	153.7	245.6	333.4	575.9	742.8
General Cargo	25.9	43.3	65.4	98.1	143.2	207.6
Coal	29.0	170.0	750.0	970.0	1070.0	820.0
TOTAL*	4449.1	5445.9	6851.7	7592.0	8336.1	8599.6

\* Excludes Sawn Timber

Table I-1.4-41

Port of Palembang:  
Summary of Commodity Flow Forecasts  
(000 Tons)

Cargo Flows	1974	1980	1985	1990	1995	2000
<u>Foreign</u>						
Imports	339.5	533.0	1163.0	1798.9	2717.2	4198.8
Exports	458.7	885.3	659.1	768.8	838.1	1039.6
Total	<u>798.2</u>	<u>1418.3</u>	<u>1822.1</u>	<u>2567.7</u>	<u>3605.3</u>	<u>5238.4</u>
<u>Domestic</u>						
Unloaded	2623.9	2479.3	2376.2	2296.4	2267.4	2358.2
Loaded	4449.1	5445.9	6851.7	7592.0	8336.1	8599.6
Total	<u>7073.0</u>	<u>7925.2</u>	<u>9191.9</u>	<u>9888.4</u>	<u>10603.5</u>	<u>10957.8</u>
GRAND TOTAL	<u>7871.2</u>	<u>9343.5</u>	<u>11050.0</u>	<u>12456.1</u>	<u>14208.8</u>	<u>16196.2</u>