

NO. 84

MALAYSIA

FEASIBILITY STUDY

FOR

BELURU / LONG LAMA / LIMBANG

TRUNK ROAD CONSTRUCTION PROJECT

INTERIM REPORT

DECEMBER 1978

JAPAN INTERNATIONAL COOPERATION AGENCY

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P R E F A C E

The Japan International Cooperative Agency (JICA), on the basis of the Scope of Work agreed between the JICA and the Economic Planning Unit (EPU) of Malaysia Government on July 21st of 1978, dispatched the First On-site Investigation Team (social, economic, transportation and technical surveys) from July 9th to September 3rd of 1978 and The Second On-site Investigation Team (installation and observation of ground control points, and photographing of the aerial survey) from August 21st to October 2nd of 1978 to Sarawak for the Feasibility Study on the construction of Trunk Road between Beluru, Long Lama and Limbang.

This is an interim report on the social, economic, transportation and technical analysis for the selection of the optimum route of the trunk road, based upon the on-site reconnaissance together with the collection of materials and informations carried out by both the survey teams.

We analyzed the social and economic activities of the project area relating to those of the whole Sarawak, estimated the development potentials in details, then, drew the regional development scheme, hereupon, forecast the future traffic demand.

We selected the optimum route after analyzing physical conditions such as topography, Meteorology and hydrology of the project area covered by the tropical jungle, together with reviewing fundamental technical requirements for the alternative routes.

As for the aerial photography survey which was carried out in order to produce the topographical map of 1/10,000 in scale along the optimum route, the installation and observation of ground control points, photographing were finished, and mapping work is being underway in Japan.

The on-site investigation team of Phase II study will be dispatched in order to determine the optimum route based on the above topographical map and the results of social economic, transportation and technical analysis.

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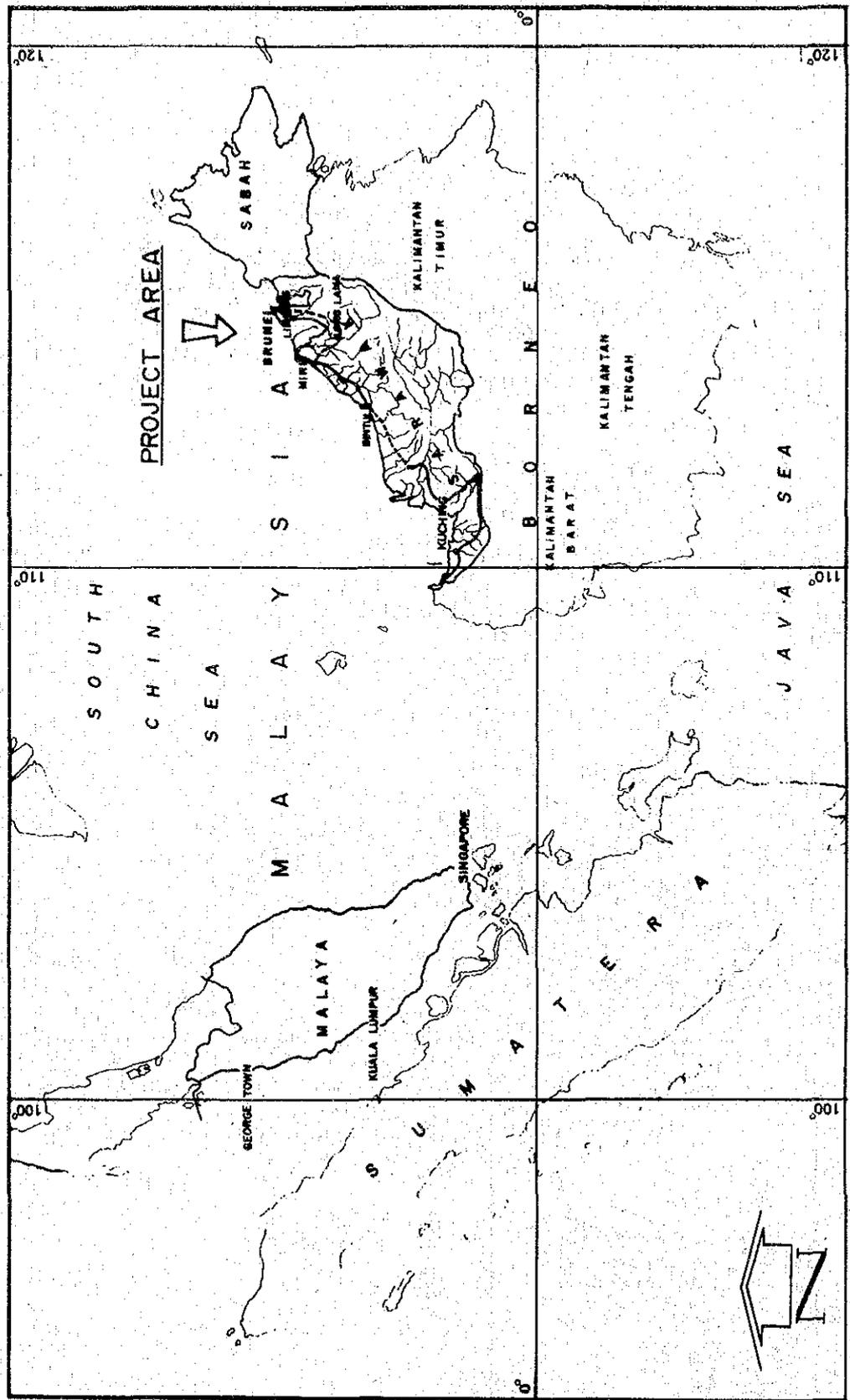
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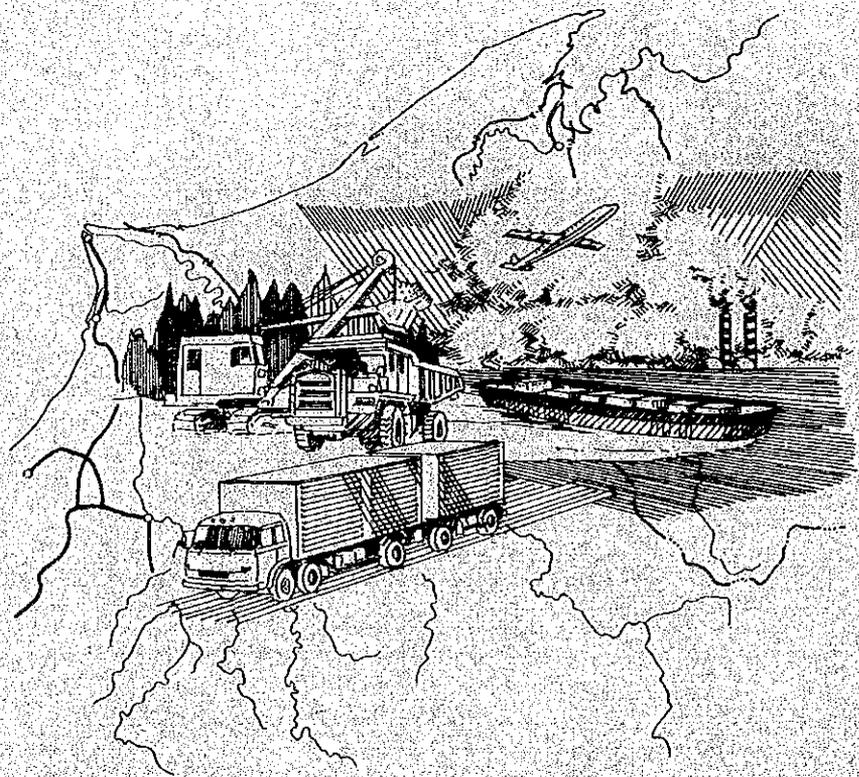
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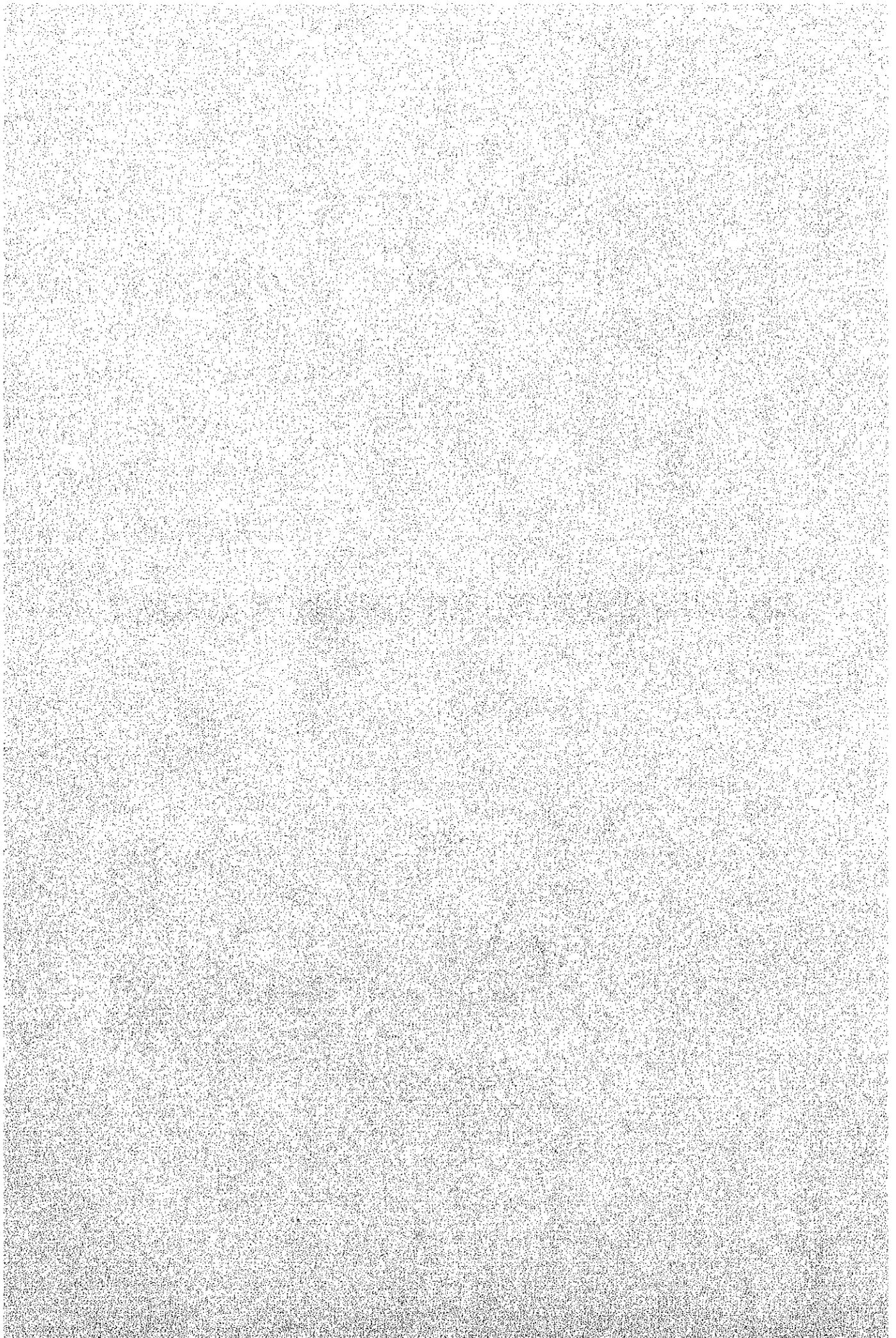
MAP OF MALAYSIA



Chapter 1

GENERAL BACKGROUND INFORMATION ON SARAWAK





1-1 OUTLINE OF SARAWAK ECONOMY

1-1-1 GDP and Industrial Structure

Table 1-1 shows the trends of GDP in Sarawak. For the year 1975, GDP amounts roughly to M\$2,000 million at current prices two and a half times of that achieved in 1970 (about M\$800 million), meaning an average annual growth rate of about 20%. The high rate of growth in nominal terms is largely due to the steep rise in oil prices accompanied by a general increase in prices.

In terms of GDP at fixed prices as of 1970, the real-term growth rate from 1970 through 1975 underwent significant fluctuations from year to year and as a result the annual growth rate averages around 7% for this five-year period, and 4.5% for the four-year period from 1971 to 1975.

The average per capita GDP is M\$1,844 (about US\$ 840) at 1975 market prices. The growth rate in real terms for the 1970-1975 period is 4.6% while the annual population growth rate is about 2.6% for the same period.

Table 1-1 GROSS DOMESTIC PRODUCT AND PER CAPITA GDP, SARAWAK

Item	Actual						Average Annual Growth Rate (%)
	1970	1971	1972	1973	1974	1975	
G.D.P. (M\$ million)							
- Current prices	820	959	1,055	1,370	1,884	2,034	21.5
- 1970 prices	820	927	999	1,054	1,177	1,152	7.2
Population (000)	972	997	1,022	1,048	1,075	1,103	2.6
Per Capita GDP (M\$)							
- Current prices	844	962	1,032	1,307	1,753	1,844	18.5
- 1970 prices	844	930	977	1,005	1,094	1,044	4.6
Growth Rate (%)							
- GDP ;nominal	-	14.0	7.3	26.6	34.1	5.2	-
;real term	-	13.0	7.8	5.5	11.7	-2.1	-
- Per Capita GDP;	-	10.2	5.1	2.9	8.9	-4.6	-
real term	-						

Source: Sarawak Annual Statistical Bulletin, 1976; Dept. of Statistics General Economic Indicators for Sarawak, 1975; S.P.U.

Table 1-2 gives an industrial breakdown of GDP. In 1975, the mining and quarrying sector (petroleum industry for the most part) represents 39.5% of the whole, with other sectors following in decreasing order: agriculture, 21.7%; commerce, 16.1%; public services, 11.9%; and manufacturing industries, 6.0%.

It should be noted that while the mining and quarrying sector accounted for only 3.6% of GDP in 1970 it has achieved a dramatic turn about and is currently the leading industry in the Sarawak economy due to the increased production of oil which was discovered off the coast of Miri in 1968 and the associated increase in oil prices.

Although the rapid growth of the mining and quarrying sector caused the other sectors to drop in relative shares, these can be regarded, in terms of the actual amount of production, as showing a steady growth except for the forestry and logging sector, which suffered from the diminished world market demand following the oil crisis. The trend in production of each industrial sector from 1967 to 1975 is given in Appendix Table A-1-1.

Table 1-2 GROSS DOMESTIC PRODUCT BY INDUSTRIAL SECTOR,
SARAWAK

Sector	1970		1975	
	M\$ million	%	M\$ million	%
1. Agriculture, Forestry and Fishery	319	38.9	442	21.7
a) agriculture/livestock	168	20.5	276	13.5
b) forestry/logging	133	16.2	69	3.4
c) fishery	18	2.2	97	4.8
2. Manufacturing	77	9.4	122	6.0
3. Building and Construction	45	5.5	98	4.8
4. Commerce	222	27.1	327	16.1
a) transport/communication	31	3.8	70	3.4
b) wholesale/retail trade	125	15.2	169	8.3
c) banking/insurance	13	1.6	22	1.1
d) ownership of dwellings	53	6.5	66	3.3
5. Services	127	15.5	241	11.9
a) public administration/defence	45	5.5	80	4.0
b) electricity/water	12	1.5	21	1.0
c) services	70	8.5	140	6.9
Sub-total	790	96.4	1,230	60.5
6. Mining and Quarrying	30	3.6	804	39.5
TOTAL	820	100.0	2,034	100.0

Source: Sarawak Annual Statistical Bulletin, 1976, Dept. of Statistics

Table 1-3 shows the number of workers employed in respective sectors. The figures were taken as of 1970, but it is considered that the importance of the agricultural sector in terms of employment as shown in this table has not changed at all judging from the fact that the rapid growth of the mining and quarrying sector is due for the most part in the increase in oil production. The agricultural sector with its share of more than 60% is overwhelmingly leading the other sectors.

Table 1-3 EMPLOYMENT STRUCTURE, 1970, SARAWAK

Industrial Sector	Number	(%)
Agriculture, Forestry and Fishery	220,592	(60.6)
Mining and Quarrying	1,112	(0.3)
Manufacturing	45,287	(12.4)
- agricultural products requiring substantial processing	26,969	(7.4)
- others	18,318	(5.0)
Building and Construction	5,587	(1.5)
Commerce	24,649	(6.8)
- transport/storage/communication	6,624	(1.8)
- others	18,025	(5.0)
Services	41,453	(11.4)
- electricity/gas/water/sanitary services	1,451	(0.4)
- others	40,002	(11.0)
Industry not adequately described	25,420	(7.0)
TOTAL	364,100	(100.0)

Source: Sarawak Annual Statistical Bulletin, 1976

1-1-2 Import and Export

The economy in Sarawak largely depends on its trade, the extent of which being shown by the degree of dependence on exports (the rate of f.o.b. amount of export to G.D.P.) and also of the dependence upon imports (the rate of c.i.f. amount of import to G.D.P.) which respectively are 75.2% and 46.1% for the year 1975.

For reference, the rates Japan achieved for the same year are 11.4% and 11.9%, while those of Malaysia as a whole are both a little over 50%.

Since 1970 the amount of exports, as shown in Table 1-4 has shown a steady increase over the amount of imports, which has also been increasing, with a consequent increment in trade surplus from M\$11 million for 1970 to a little over M\$1,000 million for 1977. For the year 1975, the trade surplus of M\$540 million accounts for 26% of GDP.

Sarawak's major trading partners include, in the export field, Japan, Singapore, Peninsular Malaysia, U.S.A., Philippines and Thailand. In the case of imports, included are Peninsular Malaysia, Brunei, Japan, U.S.A., Singapore, England and China. Countries of which imports and exports exceed M\$5,000 million are Peninsular Malaysia, Japan and Singapore only.

Table 1-4 IMPORTS AND EXPORTS, SARAWAK

Year	Imports	Exports			Visible Balance of Trade Surplus/Deficit
		Local Produce	Re-exports	Total	
1970	660	495	176	671	+11
1971	693	465	323	788	+95
1972	471	502	102	604	+133
1973	600	743	91	834	+234
1974	1,005	1,213	173	1,836	+381
1975	851	1,240	147	1,387	+536
1976	1,069	1,964	258	2,222	+1,153
1977	1,117	n.a.	n.a.	2,153	+1,036

Source; Annual Statistical Bulletin, Sarawak.

In 1977 the export figure amounted to about M\$2,150 million, i.e. 3.2 times as much as that for 1970 and 1.55 times as much as that of 1975 however, it should be noticed that in terms of the amount of export items the number is rather limited. Oil and its products are predominant with a share of 66% (about M\$1,400 million), followed by timber at 17% (about M\$360 million), the two representing 83% of the total export amount. Following in much lower percentages, come the primary agricultural products at 8% (about M\$170 million) and manufactured goods at 3% (about M\$70 million).

The import total for 1977 amounted close to M\$1,120 million, i.e. 1.7 times that of 1970 and 1.3 times that of 1975. With the exception of oil products, items in general have been increasing though at a slower rate than exports. Machinery and transport equipment have a 30% share (M\$330 million) followed by foodstuffs at 26% (M\$290 million), industrial products at 20% (M\$220 million), oil products at 11% (M\$130 million) and chemicals at 8% (M\$90 million), all these representing 95% of the total import amount.

In short, the trade structure shows a pattern of exporting raw materials and primary products while importing industrial products and capital goods. No significant change has been observed in this basic pattern since 1970.

Table 1-5 IMPORTS AND EXPORTS BY COMMODITY SECTION

(M\$ million)

	Imports			Exports			Balance of Trade		
	1970	1975	1977	1970	1975	1977	1970	1975	1977
0. Food	102.5	182.6	234.1	62.1	114.5	167.0	Δ58.4	Δ68.1	Δ67.1
1. Beverages and Tobacco	27.3	38.5	51.7	0.5	0.5	0.7	Δ26.8	Δ38.0	Δ51.0
2. Crude Materials Inedible	9.0	22.4	35.2	241.1	165.1	426.6	232.1	142.7	391.4
3. Mineral Fuels	293.0	142.4	125.1	327.0	1,025.3	1,423.3	34.0	882.9	1,298.2
4. Animal/Vegetable Oils and Fats	0.7	2.4	2.5	3.5	8.1	23.8	2.8	5.7	21.3
5. Chemicals	32.8	68.5	92.7	0.3	0.7	1.2	Δ32.5	Δ 67.8	Δ 91.5
6. Manufactured Goods	68.9	141.8	162.2	25.0	35.8	65.6	Δ43.9	Δ106.0	Δ 96.6
7. Machinery and Transport Equipment	86.7	177.1	332.6	5.0	17.7	26.4	Δ81.7	Δ159.4	Δ306.2
8. Miscellaneous Manufactured Articles	28.2	50.0	60.5	2.3	4.5	6.8	Δ25.9	Δ 45.5	Δ 53.7
9. Other Miscellaneous Transactions	11.3	25.2	20.8	4.6	15.2	11.9	Δ 6.7	Δ 10.0	Δ 8.9
TOTAL	660.4	850.9	1,117.4	671.4	1,387.4	2,153.3	11.0	270.0	1,035.9

Source: Department of Statistics

1-2 POPULATION

1-2-1 Population Trends

The last census was carried out in 1970 and it is estimated that Sarawak has a population of about 1.16 million in 1977 as shown in Table 1-6. Accurate statistical figures regarding population are available only for the years in which a census performed every ten years was undertaken.

For the years other than the census years, the estimates by the Department of Statistics are used.

According to the latest estimation, the mean annual population growth rate after 1970 is about 2.6%. Sarawak is referred to as having an increasing birth rate coupled with a decreasing death rate tendency. But as far as this table is concerned, however, its natural population growth rate tends to be showing a gradual decline.

Table 1-6 POPULATION OF SARAWAK, 1960-1977

Year	Population (Mid-year Estimates)	Annual Growth Rate (%)	Rate of Natural Increase (per 1,000)	Birth Rate (per 1,000)	Death Rate (per 1,000)
1960	744,529 ^{1/}	-	20.6	26.4	5.8
1970	972,431 ^{1/}	2.7	25.6	30.8	5.2
1971	997,031 ^{2/}	2.5	24.4	29.6	5.2
1972	1,022,119 ^{2/}	2.5	25.3	30.2	4.9
1973	1,048,480 ^{2/}	2.6	25.6	30.4	4.8
1974	1,074,970 ^{2/}	2.5	24.3	28.5	4.3
1975	1,102,956 ^{2/}	2.6	24.2	29.2	5.0
1976	1,132,000	2.6	n.a.	n.a.	n.a.
1977	1,161,000	2.6	n.a.	n.a.	n.a.

Source: Dept. of Statistics and S.P.U.

^{1/} Census figure

^{2/} Figures estimated by Dept. of statistics

1-2-2 Distribution of Population

Table 1-7 shows the population distribution by division. The 1977 figures for the respective divisions were obtained by multiplying the 1970 population of Sarawak by the 1970 component ratio of each division, and being generally used as an official statistical value.

Sarawak is found to have a very low population density, i.e. only 9.3 persons/km² (24 persons/mile²) and also having a non-uniform distribution pattern. The First Division has a concentration over one third of the total with a consequent density as high as 46 persons/km² (117 persons/mile²). The western Sarawak area comprising the First, the Second, the Third and the Sixth Divisions accounts for 77% of the total population while taking up only 31% of the total land. The population density is high in the flat coastal area while diminishing abruptly towards the inland areas. The Seventh Division which is located inland consisting of hilly and mountainous area has a very small population of 5% along with a very low density of 1.6 persons/km² (4 persons/mile²) in spite of its huge area accounting for 31% of the land total.

The Fourth and Fifth Divisions combine two topographic features: firstly that of the flat coastal area with a relatively high population density; and secondly that of the inland areas with a low density. In 1976 the two divisions together, were populated by about 200,000 persons (18% of the total) in an area of 46,700km² (38% of the total), with a density of 4.4 persons/km².

Table 1-8 gives the population of each division, estimated for the year 1977, based on the actual annual growth rates experienced during the period from 1960 to 1970. A comparison of the results obtained in Table 1-8 with the estimates given in Table 1-7 shows that the value for the Fourth Division is a little larger while the value for the Fifth Division a little smaller.

Table 1-7 POPULATION DISTRIBUTION BY DIVISION

Division	Area		1970 ^{2/}		1977 ^{1/}	
	Sq. km.	%	Population	%	Population	Density Pers./sq.km.
First Div.	8,895	7.2	346,973	35.5	411,800	46.3
Second Div.	10,268	8.2	137,260	14.1	163,500	15.9
Third Div.	12,882	10.3	171,685	17.6	204,200	15.9
Fourth Div.	38,926	31.3	135,918	13.9	161,200	4.1
Fifth Div.	7,787	6.3	36,731	3.8	44,100	5.7
Sixth Div.	6,718	5.4	95,936	9.8	113,700	16.9
Seventh Div.	38,919	31.3	51,415	5.3	61,500	1.6
TOTAL	124,395	100.0	975,918	100.0	1,160,000	9.3

Source: Dept. of Statistics

^{1/} Estimated by applying the same percentage of 1970 population distribution

^{2/} Census figures

Table 1-8 POPULATION GROWTH BY DIVISION AND ESTIMATED POPULATION DISTRIBUTION

Division	1960		1970		Average Annual Growth Rate (%)	1977 ^{1/}	
	Population	(%)	Population	(%)		Estimated Population	(%)
First Div.	247,945	(33.3)	346,973	(35.5)	3.42	430,700	(37.1)
Second Div.	109,422	(14.7)	137,260	(14.1)	2.29	157,800	(13.6)
Third Div.	261,487	(35.1)	171,685	(17.6)	2.01	359,700	(31.0)
Sixth Div.			95,936	(9.8)			
Seventh Div.			51,415	(5.3)			
Fourth Div.	96,666	(13.0)	135,918	(13.9)	3.47	169,300	(14.6)
Fifth Div.	29,000	(3.9)	36,731	(3.8)	2.39	42,500	(3.7)
TOTAL	744,529	(100.0)	975,918	(100.0)	2.74	1,160,000	(100.0)

^{1/} Estimated based on the annual growth rate of 1960 - 1970

1-2-3 Labour Force Status

The labour population in 1970 roughly total 370,000 persons, 38% of the whole population. Table 1-9 characterizes the total labour force throughout Sarawak, while Table 1-10 shows the unemployment rate of the urban labour force in the six major cities, namely: Kuching, Sibul, Miri, Sarikei, Simanggang and Limbang. The urban area has an unemployment rate of 8.7% as against 2.8% for Sarawak as a whole.

Table 1-9 LABOUR FORCE STATUS OF POPULATION AGED 10 YEARS AND OVER, 1970, SARAWAK

Age-Group	Employed	Un- employed	Total	Unemploy- ment Rate(%)	Rate of Labour Force(%)
10 - 14	21,545	1,203	22,748	5.3	19.5
15 - 19	52,113	3,382	55,495	6.1	56.1
20 - 24	52,134	1,887	54,021	3.5	71.3
25 - 29	45,325	878	46,203	1.9	72.3
30 - 34	38,599	638	39,237	1.6	72.9
35 - 39	34,526	564	35,090	1.6	72.4
40 - 44	30,827	444	31,271	1.4	74.1
45 - 49	25,684	362	26,046	1.4	73.2
50 - 54	23,237	398	23,635	1.7	70.2
55 - 59	14,702	249	14,951	1.7	65.3
60 - 64	11,946	235	12,181	1.9	57.7
65 & above	10,533	244	10,777	2.3	39.0
Total	361,171	10,484	371,655	2.8	58.0

Table 1-10 UNEMPLOYMENT RATE BY AGE GROUP, 1974, 6 MAJOR TOWNS OF SARAWAK 1/

Age Group	Total Rate	Active Rate	Inactive Rate (%)
15 - 19	26.7	18.2	8.5
20 - 24	11.3	8.5	2.8
25 - 29	4.1	2.2	1.9
30 - 34	2.1	1.1	1.0
35 - 39	1.6	0.9	0.7
40 - 44	2.5	1.3	1.2
45 - 49	4.0	1.3	2.7
50 - 54	3.0	0.7	2.3
55 - 59	5.5	2.5	3.0
60 - 64	5.9	0.6	5.3
Total	8.7	5.6	3.1

1/ Including Kuching, Sibul, Miri, Sarikei, Simanggang and Limbang

1-3 TRANSPORTATION SYSTEMS

1-3-1 Outline

The transportation systems of Sarawak comprise of road, airway networks and waterways as shown in Fig. 1-1. Mostly due to topographical limitations, Sarawak's urban areas were developed along the coast with the accompanying transportation infrastructures organized centered around them. The transportation systems in existence at present are still not satisfactory enough to fully serve the communities scattered throughout the vast land and to help develop the country's natural resources.

The area from Kuching to Sibul has a comparatively better system of roads, ports and other infrastructure, one of the major reasons for this being that it has roughly two thirds of the total population. On the other hand, there are many areas that cannot be reached by road being accessible only by air for which the flight is irregular and unreliable with limited capacity and costly fares, while the other alternative is by time consuming waterways.

Such large fundamental gaps among areas in their degree of infrastructural development and consequent convenience of transportation will further widen the regional disparities both in terms of economy and public services.

The Government is greatly concerned with this situation and since the 2nd Five-Year Plan its efforts have been to focus on the areas where infrastructural development was backward. As a result there are a number of on-going projects reflecting the governmental policy, including: completion of the whole of the 1st Trunk Road System; strengthening and surfacing of the Miri-Bintulu Road; construction of the Bintulu deepwater port; extension of the Miri Airport; and construction of the Beluru Road.

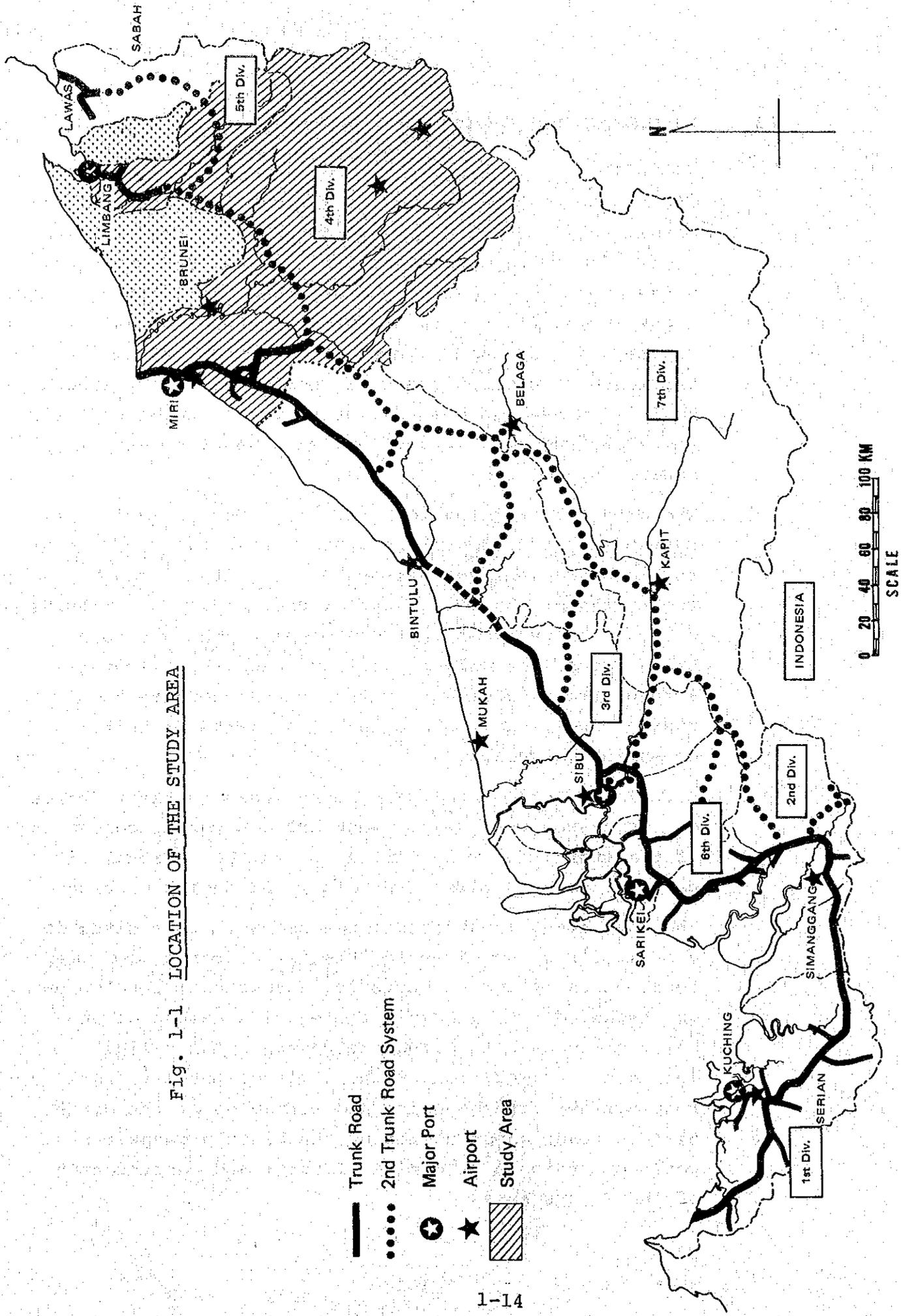


Fig. 1-1 LOCATION OF THE STUDY AREA

- Trunk Road
- 2nd Trunk Road System
- ★ Major Port
- ★ Airport
- ▨ Study Area

1-3-2 Road

Though, since 1965 efforts have been taken in developing the trunk road system to link the major population centres of the State with each other, the system is as yet still inadequate with several important links still missing. The Kuching - Sibul trunk road with a length of 484 kilometers, and the 215 kilometer long Miri - Bintulu trunk road were completed in 1967 and 1972 respectively, forming very important sections of the First Trunk Road System. When the Sibul - Bintulu trunk road is completed the State will be linked by trunk road from the 1st Division to the 4th Division and extending to the 5th Division via Brunei.

With the expected completion of the First Trunk Road System, Government plans are now drawn up for the development of a Second Trunk Road System that will open up the more ragged sparsely populated interior areas, and also for strengthening of the First Trunk Road System including surfacing, replacement of inadequate bridges and development of feeder roads branching from the trunk roads.

1-3-3 Waterways

The water transport system in Sarawak consists of coastal shipping and the river system. Water transport has been playing an important role in both external as well as internal shipping due to the fact that Sarawak is a trade-oriented country with a land transport system that is not adequately developed.

At present there are two major ports in Kuching and Rajan that are operated under the jurisdiction of "The Port Authorities Ordinance" in addition to other minor ports such as Miri, Marudi, Limbang, Lawas, Bintulu etc. In view of the major development efforts of the Government in the Fourth Division and the limited possibility of expanding the facilities of the Miri

port, development of a deepwater port at Tanjung Kidurong in Bintulu has been started and on its completion in 1982, it will be the first and only deepwater port in the State. The port will include loading facilities for LNG, berths with drafts of up to 38 feet for general cargo and both liquid and dry bulk cargos. The bulk of the general cargo throughout for the port is expected to be palm oil and timber products.

Although internal shipping is mainly made up of small vessels with loading capacities of mostly up to 100 tons, they do however play a vital role in the internal distribution of goods and of providing shuttle services for passengers to and from areas not accessible by the other modes of transport, as well as serving as a cheap substitute means of transport for particularly bulky goods. The widespread river system has been providing traditional transport channels not only in the coastal areas but also in the interior areas. Where no roads exist, rivers are the only mode of transport and communities have been developed along the river system navigable by longboats or small vessels.

1-3-4 Airways

The air transport network covers major cities and several important rural communities scattered in the remote interior which are not served by roads or are not accessible by water. Though there are a total of 47 airports in Sarawak, those other than Kuching, Sibul, Bintulu and Miri are extremely small and only Kuching and Miri can facilitate aircraft of the Boeing 737 class, while Sibul and Bintulu can only take types up to Fokker Friendship F27 class aircraft. The remainder can facilitate light STOL aircraft like the BN2 or Cessna classes. International services are mainly only available through Kuching and through Miri to a limited extent. A feasibility study is underway regarding the construction of New Limbang Airport.

1-4 INDUSTRIAL ACTIVITIES

1-4-1 Agriculture

(1) Outline

According to the census taken in 1970, about 60% of the total labour population is engaged in agricultural industries, the share of which in ADP is about 39%. The percentage has since been decreasing to a level of 22% in 1975. This situation is mainly due to the rapid growth of the mining and quarrying industries with oil production as the leading sector and also with the growth of the tertiary industries but looking closely it can only be called a decline in the relative position for as Appendix Table A-1-1 shows, the agricultural sector has recorded a real-term growth rate of about 3% during the period.

The agricultural industries in Sarawak have a basic characteristic of being mostly composed of small-scale traditional farming by local inhabitants on comparatively small farm land with limited experience. The estate type are found only in the growing of oil palms, pepper and for livestock-farming. The fundamental geographic feature of a vast land sparsely populated is the main cause of the delay in the development of various infra-structures that are essential for promoting agricultural industries and also in preventing investments from taking their full effect. Major problems are:

- a) The lack of transportation, irrigation and drainage facilities and insufficient labour force make large scale modern agriculture development difficult.
- b) The local farming in general employs rather primitive agricultural methods while suffering from low yield accompanied by a low income, which is also due to the complicated social customs as well as the land tenure systems.

The technical guidance and other governmental subsidizing programs have been introduced and use of fertilizer and other agricultural chemicals as well as introduction of high yielding types, have been gradually diffused but only at a slow rate.

- c) The smooth execution of agricultural research is greatly hampered as the drawing up of development plans is highly affected by the very poor accessibility particularly to the interior areas.

(2) Agricultural Production

The major crops in Sarawak are rice, pepper, rubber, sago, oil palms and coconuts. Of these, pepper, rubber, coconut oil and refined sago flour provide the major export items, with oil palms being a recent inclusion. As shown in Appendix Table A-1-2, the crop export amount totalled M\$228.5 million roughly representing 11% of the whole amount of export, in other words about one third of the amount excluding oil and oil products. Table 1-11 shows the export trends of major agricultural products.

Table 1-11 EXPORTS OF MAJOR CROPS

Year	Rubber			White Pepper			Black Pepper		
	000 Tons	Value (M\$000)	Price (M\$/Ton)	000 Tons	Value (M\$000)	Price (M\$/Ton)	000 Tons	Value (M\$000)	Price (M\$/Ton)
1967	29.0	32,363	1,116	11.0	22,489	2,044	8.9	12,980	1,458
1968	24.3	26,314	1,083	11.0	19,089	1,735	12.2	15,575	1,277
1969	39.5	49,866	1,262	12.1	27,604	2,281	17.1	25,283	1,479
1970	21.9	23,976	1,095	9.4	25,102	2,670	15.1	31,103	2,060
1971	19.7	16,594	842	9.0	24,634	2,737	18.0	38,174	2,121
1972	20.0	14,594	730	10.3	28,790	2,795	16.0	29,288	1,831
1973	42.2	56,719	1,344	10.6	38,407	3,623	12.3	27,849	2,264
1974	32.8	50,428	1,537	13.1	56,040	4,278	15.9	46,877	2,948
1975	29.2	35,866	1,228	9.8	39,041	3,984	20.6	61,854	3,003
1976	40.6	64,301	1,584	9.8	41,338	4,218	25.7	83,105	3,234

Year	Sago Flour			Coconut Oil			Palm Kernel Palm Oil		
	000 Tons	Value (M\$000)	Price (M\$/Ton)	000 Tons	Value (M\$000)	Price (M\$/Ton)	000 Tons	Value (M\$000)	Price (M\$/Ton)
1967	36.7	4,809	131	3.1	2,295	740	-	-	-
1968	36.7	4,946	135	3.8	2,929	771	-	-	-
1969	29.3	3,705	126	4.2	3,258	776	-	-	-
1970	28.6	3,835	134	4.1	3,447	841	-	-	-
1971	23.2	3,351	144	4.4	3,509	798	-	-	-
1972	18.5	2,309	125	2.7	1,620	600	-	-	-
1973	23.8	3,619	152	3.8	3,966	1,044	-	-	-
1974	28.0	7,102	254	4.0	7,885	1,971	0.6	807	1,345
1975	23.0	5,305	231	3.8	4,128	1,086	4.4	4,165	947
1976	28.1	6,702	239	4.2	4,811	1,145	8.5	8,223	967

Source: Agricultural Statistics of Sarawak, 1976

a) Rice

Rice is the most important food crop in Sarawak and, as is shown in Table 1-12, its planted acreage totals 120,000ha yearly. Of this total 58,000ha is for wet paddy while 66,000ha for hill-paddy, respectively yielding 100,000 tons and 49,000 tons, for a total of 149,000 tons. Both of these types are mostly of single-crop farming and their yield is as low as 1.9 tons/ha and 0.7 tons/ha respectively.

Hill-paddy is still popular among inlanders in spite of its low productivity compared with wet paddy rice as it needs less fertilizer and labour due to the traditional "shifting cultivation" method. This cultivation method causes much damage to the forest resources as regulating measures are generally limited.

Table 1-12 PADDY PRODUCTION

Year	Hill Paddy			Wet Paddy		
	Area Planted (ha)	Production (Tons)	Yield (Ton/ha)	Area Planted (ha)	Production (Tons)	Yield (Ton/ha)
1970	75,818	67,990	0.897	51,545	78,959	1.532
1971	73,267	59,973	0.819	61,572	97,499	1.583
1972	85,628	61,172	0.714	60,062	101,224	1.685
1973	62,501	44,208	0.707	48,179	85,746	1.780
1974	66,549	50,083	0.753	50,658	103,299	2.040
1975	64,201	47,182	0.735	54,176	97,030	1.791
1976	65,950	49,797	0.755	58,066	101,276	1.744
Average 1974-76	65,567	49,021	0.748	54,300	100,535	1.851
1976/ 1970	0.87	0.73	0.84	1.13	1.28	1.11

Source: Agricultural Statistics of Sarawak, 1976

Sarawak has a self-supply ratio of rice of about 60%, and imports some 60,000 tons of rice per year. The yearly amount of foreign currency payment for imported rice in the last several years has ranged from M\$40 million to M\$50 million. To achieve a complete self-sufficiency of rice is one of the major targets of Sarawak's agricultural policies. To gain this end the Paddy Production Unit was established in 1973. The unit has performed several works of research aiming mainly at extending paddy acreage and has found several rice potential areas. Of these, Limbang Valley of 24,000ha in area is expected to be the most promising, although the area has a number of problems to be solved before it can be utilized for rice production, such as developing irrigation and drainage facilities, defining appropriate cultivating methods and securing an adequate labour force.

At the present a feasibility study is being carried out there by the team from Belgium. Table 1-13 below shows the rice deficit-surplus position for Sarawak for the past years.

Table 1-13 DEFICIT/SURPLUS OF RICE FOR SARAWAK

Year	Local Production		Import		Total Consumption (Tons)	Population (No.)	Per Capita Consumption (Kg.)
	Paddy (Tons)	Rice Equiv. ^{1/} (Tons)	Tons	% of Total			
1970	146,949	91,108	58,797	39.2	149,905	972,431	154
1971	157,472	97,633	59,269	37.8	156,902	997,031	157
1972	162,396	100,686	62,727	38.4	163,413	1,022,119	160
1973	129,954	80,571	69,933	46.5	150,504	1,048,480	144
1974	153,382	95,097	87,214	47.8	182,311	1,074,970	170
1975	144,212	89,411	36,201	28.8	125,612	1,102,956	114
1976	151,073	93,665	63,149	40.3	156,814	1,132,000	139
Average 1974-76	149,556	92,725	62,188	40.1	154,913	1,103,309	140

Source: Agricultural Statistics of Sarawak, 1976

^{1/} 1 ton of paddy x 0.62 = 1 ton of rice.

b) Pepper

Pepper production in Sarawak has a long history. It first started in the 1930s, and gradually became more and more popular as a cash crop. Consequently, it makes up a conspicuous share of the export total. In 1976, an amount of about M\$125 million (about 35,500 tons in weight) was exported as shown in Table 1-11. The total acreage in Sarawak is about 10,000ha, but the average acreage per farming family is only 0.2 to 0.4ha. Most of the pepper production comes from the First, Second, Third, and Sixth Divisions.

Though pepper, having a high profitability in comparison with other farm products, can be

regarded as a good means of increasing the income of the farming family, it requires a great deal of labour input resulting in high production costs, and also a period of 3 years is needed before the first crop is productive. For these reasons, farmers without enough funds cannot engage in its growing. The Government is therefore subsidizing farmers in want of funds in order to promote its production.

c) Rubber

Sarawak produces about 40,000 tons of rubber, which is very small compared with the whole tonnage produced in Malaysia. Although small in this aspect it does occupy a position second to pepper in the agricultural exports. At present its culture acreage totals about 190,000 ha. Most of the area is shared by small holders, leaving only a small portion for estate-type planters. As a result rubber culture in general is not performed under satisfactory management therefore suffers with low productivity. Table 1-14 shows the estimated area of rubber in Sarawak on 1970-1972.

Table 1-14 ESTIMATED AREA OF RUBBER

Division	1970		1972 ^{1/}	
	High Yielding	Ordinary	High Yielding	Ordinary
First Div.	19,907	22,272	21,522	21,260
Second Div.	15,428	20,364	15,871	20,214
Third, Sixth Seventh Div.	20,413	58,185	22,576	56,743
Fourth Div.	15,274	8,139	16,310	7,995
Fifth Div.	6,552	3,483	7,189	3,372
Total	77,574	112,743	83,468	109,584

Source: Agricultural Statistics of Sarawak, 1976

^{1/} The Rubber Planting Scheme was terminated in 1972. It is assumed that planting outside of this scheme is negligible and with the termination of scheme planting in 1972, the 1973 - 76 area is assumed to remain at the 1972 level.

d) Oil Palm

Though oil palm have been introduced comparatively recently, its production is rapidly increasing and it is expected that it will provide an important agricultural product for export in the future. Oil palm culture started at the beginning of 1970 as a part of the SLDB Development Program, and covered about 17,000ha in 1976. Table 1-15 shows the oil palm production in Sarawak.

Table 1-15 OIL PALM PRODUCTION IN SARAWAK

Year	Acreage (ha)			Production (tons)			Yield (ton/ha)		
	Mature	Immature	Total	FFB	Oil	Palm Kernel	FFB	Oil	Palm Kernel
1971	-	2,670	2,670	-	-	-	-	-	-
1972	-	5,593	5,593	-	-	-	-	-	-
1973	34	7,165	7,199	-	-	-	-	-	-
1974	947	10,592	11,539	4,206	597	96	4.44	0.63	0.10
1975	4,391	11,187	15,578	24,572	3,283	615	5.60	0.75	0.14
1976	6,944	10,041	16,985	39,821	5,508	936	5.73	0.79	0.13

1-4-2 Forestry

Forestry in Sarawak holds an important position next to oil in terms of export amount. As shown in Appendix Table A-1-7, about 2.46 million tons/cf of round timber was produced in 1976, most of which was exported. Table 1-16 shows the past tonnage/value of exported timber. The export of round timber suffered a sharp drop under the direct influence of decreased demand due to the oil crisis and could not recover its earlier level until 1976. Sawn timber, in contrast to this, was less affected. In 1976, round and sawn timber was exported by 1.64 million and 0.20 million tons/cf respectively, each equivalent to M\$240 million and 120 million, i.e. 2.9 times those in 1965 as shown in Table 1-16.

Table 1-16 VOLUME OF EXPORT TIMBER

Year	Round Timber		Sawn Timber	
	Tons/CF 000	M\$ million	Tons/CF 000	M\$ million
1965	672.6	47.3	191.8	35.2
1966	1,071.2	82.5	156.6	26.3
1967	1,243.1	99.8	194.3	36.2
1968	1,655.9	138.7	219.6	42.4
1969	1,697.3	143.4	215.2	43.2
1970	1,732.9	148.4	222.1	49.8
1971	1,412.0	120.8	199.1	47.1
1972	1,107.4	83.5	214.7	50.9
1973	1,049.9	123.9	181.6	87.0
1974	934.5	108.2	151.9	57.7
1975	697.0	63.7	170.9	62.2
1976	1,638.6	242.1	203.5	117.0

Source: Annual Statistical Bulletin, Sarawak

Formerly, the logging industry in Sarawak mostly developed swamp forests where ramin is abundant. But more and more hill forests have come into development due to dwindling resources and for the purpose of developing other commercial species.

Timber processing industries in the area chiefly comprise of: sawing (for export, domestic consumption or secondary processing); manufacturing veneer and plywood (mostly for export); production of furniture, mouldings, dowels, laminated boards and chipwood (both for export and domestic consumption). Among these, sawing is one of the important sectors of Sarawak's industry. In 1976, as is shown in Appendix Table A-1-8, some 120 enterprises engaged in this industry produced about 260,000 tons/cf, out of which about 200,000 tons were exported.

Two companies, both in Kuching, are engaged in the production of veneer and plywood at present. In 1976,

they produced 110 million sq.ft. of veneer and 55 million sq.ft. of plywood, about 60% of which was exported. Only one company is engaged in chipping, and it produced in the same year about 160,000 tons of chipwood from mangroves, all for exporting. Mouldings are produced by 14 companies at present (6 each in Kuching and Sibuan and 2 in Miri). A total amount of about 45,000 tons/cf of mouldings and dowels was produced chiefly from ramin and exported in the most part. Three companies are producing laminated boards (2 in Kuching and the other in Sarikei). Their output in 1976 of about 2,250 ton/cf in total was mostly for domestic consumption. Such timber processing sectors are still operated on a small scale except for the sawmills but as the products have rather a high value due to their demand in foreign markets being more stable than that of round timber future growth is highly anticipated.

1-4-3 Manufacturing

(1) Outline

Manufacturing industries in Sarawak registered a share of only 6% of GDP in 1975, showing that their growth rate is rather limited. Table 1-17 gives the results of research that was conducted in 1974 regarding such establishments employing more than five workers.

This table shows that about 70% of the total value added is contributed by the petroleum refining and timber processing sectors. The latter sector not only has a share of about 50% of the total added value but also employs 53% of the whole labour force, thus occupying the most important position. As for the remainder, the only ones that are conspicuous generally are the food processing, printing, automotive repair and assembly sectors.

Table 1-17 OUTLINE OF MANUFACTURING SECTOR, 1974, SARAWAK

Industry	No. of Estab- lish- 1/ ments	Gross Value of Output (M\$000)	Value Added (M\$000)	Employment	
				Total	Full- 2/ time
1. Food	68	59,096	8,195	1,292	1,111
2. Beverage Industries	18	9,740	4,372	506	486
3. Textiles	4	413	102	37	30
4. Wearing Apparel including Footwear	18	4,041	1,065	407	380
5. Wood and Cork Products except Furniture	85	142,608	59,908	8,320	8,172
6. Furniture and Fixtures except those primarily of Metal	26	7,126	1,958	536	493
7. Printing, Publishing and Allied Industry	23	10,492	5,661	1,169	1,144
8. Industrial and other Chemicals	5	4,797	1,747	124	121
9. Petroleum Refineries	1	480,420	23,061	114	114
10. Rubber Products	16	7,601	1,046	342	303
11. Plastic Products, n.e.c.	4	4,431	1,378	316	316
12. Pottery, China and Earthenware	5	459	250	67	57
13. Non-Metallic Mineral Products	32	3,411	1,857	720	678
14. Iron and Steel Basic Industries and the Manufacture of Fabri- cated Metal Products, except Machinery and Equipment	22	9,827	2,334	548	525
15. Machinery except Electrical	22	4,008	1,097	278	241
16. Transport Equipment	19	16,532	6,535	894	867
17. Other Manufacturing Industries including Tobacco Manufacture	14	3,805	822	170	138
Total	382	768,807	121,388	15,840	15,176

Source: Annual Statistical Bulletin, Sarawak

1/ No. of establishments is limited to those employing
5 or more paid full-time workers only

2/ Excluding part-time and unpaid-workers

The industries in the Study Area can be roughly divided into two types. The first group exports primarily processed goods while the second manufactures consumer goods on a small scale for consumption within the area. About 70% of the total industries consist of one-man businesses or are partnerships employing about 30 workers on the average. The reasons for the backward industrial development are considered to include the following:

- a) Insufficient public investment for developing and upgrading such infrastructures that are required for industrial development. It was not until quite recently that any industrial estate had come to be systematically developed;
- b) High cost of utilities such as power, industrial water and others;
- c) Small and widely scattered domestic markets for industrial products;

As Table 1-18 shows, most of the existing industries are situated in Kuching, Sibul, Miri and a few other places where the infrastructures and utilities have relatively better development.

Table 1-18 DISTRIBUTION OF MAJOR MANUFACTURING INDUSTRIES BY DIVISION, 1974 1/

Division	No. of Establish-ment	Value of Output (M\$000)	Value Added (M\$000)	Number of Workers	
				Total	Full-time
First Div.	188	146,299	39,833	6,109	5,702
Second Div.	16	23,284	11,487	1,295	1,285
Third Div.	101	64,161	24,295	4,743	4,570
Fourth Div.	62	510,074	38,245	2,471	2,413
Fifth Div.	6	1,434	425	153	152
Sixth Div.	9	23,555	7,103	1,069	1,054
Seventh Div.	-	-	-	-	-
Total	382	768,807	121,388	15,840	15,176

Source: Annual Statistical Bulletin, Sarawak

1/ Includes those establishments employing 5 or more paid full-time workers

(2) Industrialization Policy

In spite of the foregoing problems involved, the industrial sectors in Sarawak are gradually having their infrastructural requirements developed and upgraded, though not at a rapid rate, and also the income of the people has been steadily increasing. Although the limited domestic market is expected to remain small the basic direction of industrial development will be considered as follows:

- a) Development of resource-oriented industries : Industries, being not labour intensive but being based on local resources such as oil, LNG, timber etc. aiming mainly at exporting these products to overseas markets will attract foreign investors if ports and other utility conditions are improved.

b) Development of urban-type industries:

Population inflow into the cities such as Kuching, Sibul, and Miri is expected to accelerate, and therefore light industries such as food processing, furniture manufacturing, construction material manufacture and repair services will steadily grow.

The success of the ongoing comprehensive development program integrating various projects in the Bintulu areas such as the port construction and the development of LNG and other relevant industries (iron, fertilizer, timber processing industries), as well as urban development in Bintulu's hinterland hold the key to the industrial growth of Sarawak. Table 1-19 lists the industrial estates either completed or projected.

Table 1-19 INDUSTRIAL ESTATES INITIATED AND DEVELOPED BY SARAWAK ECONOMIC DEVELOPMENT CORPORATION (SEDC), AS OF NOV. 1976

Name of Indust. Estate	Total Gross Area (ha)	Area Allo- cated (ha)	Area Still Avail- able (ha)	Selling Price (M\$/ha)	Annual Rent (M\$/ha)	Lease Period (Years)	Distance from Town (km)
Pending (Kuching)	483	296	106	6.5	840	60	6.4
Piasau (Miri)	33.6	17.4	4.5	5.4	618	60	7.2
Limbang	9.7	nil	9.7	N.A.	N.A.	60	5.6
Upper Lanang Road (Sibu)	89	29.5	^{1/} 48.2	21.5 [~] 25.8	741	60	6.4
Semariang(Kuching)	48.6	1.2	^{1/} 11.3	N.A.	N.A.	60	6.4
Bintulu	101	nil	89	N.A.	N.A.	60	9.7

Source: Sarawak Economic Development Corporation

^{1/} Already developed

1-4-4 Mining and Quarrying Industries

The mining and quarrying industries are the mainstay of the Sarawak economy accounting for some 40% of GDP and some 66% of the total export amount. The important role being played by the oil sector is expected to continue for the foreseeable future while the full-scale production of natural gas off Bintulu for which development work is now under way will further enhance the relative importance the sector currently enjoys.

Gold and antimony come next in order, but have much less importance.

Table 1-20 PRODUCTION AND VALUE OF PRINCIPAL MINING PRODUCTS

Year	Gold		Crude Oil		Antimony Ore	
	Quantity (Troy Ozs)	Value (M\$ million)	Quantity (long tons)	Value (M\$ million)	Quantity (long tons)	Value (M\$ million)
1965	2,602	0.32	48,125	2.12	110	0.05
1968	2,718	0.33	198,767	8.96	51	0.02
1970	1,265	0.16	845,420	37.80	393	0.29
1971	1,428	0.18	3,223,570	161.08	630	0.41
1972	1,663	0.21	4,362,455	244.17	465	0.37
1973	939	0.19	4,270,558	311.15	386	0.35
1974	1,004	0.27	3,784,984	797.46	449	0.45
1975	1,192	0.46	4,141,689	943.85	577	0.52
1976	965	0.30	5,498,545	1,360.59	592	1.20

Source; Annual Statistical Bulletin, Sarawak, 1976.

