Chapter 1

GENERAL BACKGROUND INFORMATION ON SARAWAK

Chapter 1 GENERAL BACKGROUND INFORMATION ON SARAWAK

1-1 Outline of Sarawak Economy

1-1-1 Gross Domestic Product (GDP) and Industrial Structure

Table 1-1 shows the trends of Gross Domestic Product (GDP) in Sarawak. For the year 1975, GDP amounts roughly to M$2,000 million at current prices two and a half times 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; real term	–	10.2	5.1	2.9	8.9	–4.6	–

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 the GDP. In 1975, the mining and quarrying sector (petroleum industry for the most part) represented 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 1-3 shows the number of workers employed in respective sectors. The figures were obtained as of 1970, but it is considered that the importance of the argicultural 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 to the increase in oil production. The agricultural sector with its share of more than 60% leads the other sectors by a wide margin.

Table 1-2 Gross Domestic Product by Industrial Sector, Sarawak

Sector	1970 M$ million	1970 %	1975 M$ million	1975 %
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 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 depends largely on its trade, the extent of which is shown by the degree of dependence on exports (the rate of F.O.B. amount of export to G.D.P.) and also on the dependence upon imports (the rate of C.I.F. amount of import to G.D.P.) which are respectively 75.2% and 46.1% for the year 1975.

For reference, the rates existing in Japan for the same year are 11.4% and 11.9%, while those for 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

(M$ Million)

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 for 1975 however, it should be noted that in terms of the amount of export items the number is rather limited. Oil and

petroleum products predominate 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, are 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 although 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

(N$ 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 had 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 was performed (generally every ten years).

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

According to the latest estimate, 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. But as far as this table is concerned, however, the natural population growth rate is 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 for each Division, and being generally used as an official statistical value.

Sarawak has a very low population density, i.e., only 9.3 persons/km2 (24 persons/mile^2) and also has 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/km^2 (117 persons/mile^2). 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 areas has a very small population of 5% along with a very low density of 1.6 persons/km^2 (4 persons/mile^2) in spite of its huge area accounting for 31% of the total land.

The Fourth and Fifth Divisions combine two topographic features: first the flat coastal area with a relatively high population density; and second 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 46,700 km^2 (38% of the total), with a density of 4.4 persons/km^2.

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 Population	(%)	1970 Population	(%)	Average Annual Growth Rate (%)	1977 1/ 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 Labor Force Status

The labor population in 1970 roughly totalled 370,000 persons, 38% of the whole population. Table 1-9 characterizes the total labor force throughout Sarawak, while Table 1-10 shows the unemployment rate for the urban labor force in the six major cities, namely: Kuching, Sibu, 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 Labor Force Status of Population Aged 10 Years and Over, 1970, Sarawak

Age-Group	Employed	Un-employed	Total	Unemployment Rate(%)	Rate of Labor 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

Source: Department of Statistics

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, Sibu, Miri, Sarikei, Simanggang and Limbang

1-3 Transportation Systems

1-3-1 Outline

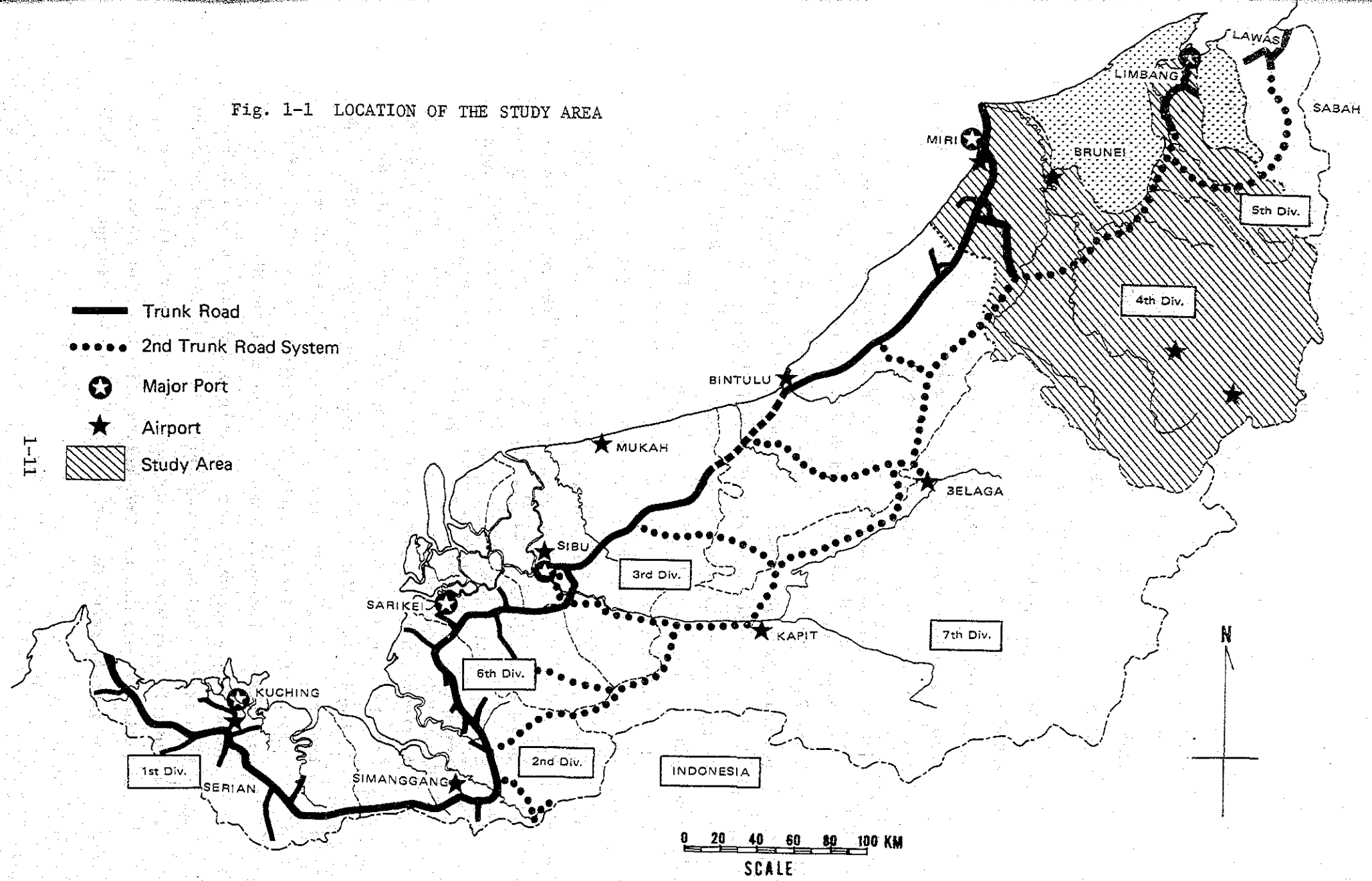
The transportation systems of Sarawak consist of road, airway networks and waterways as shown in Fig. 1-1. Mostly due to topographical limitations, Sarawak's urban areas were developed along the coast with the accompanying transportation infrastructures organized centered around them. The transportation system in existence at present is 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 Sibu 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 between 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 ongoing 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



1-3-2 Roads

Although, since 1965 efforts have been made to develop the trunk road system to link the major population centres of the State with each other, the system is still inadequate with several important links still missing. The Kuching - Sibu trunk road with a length of 484 Kms (300mls.), and the 213 kilometer (132mile) long Miri - Bintulu trunk road were completed in 1967 and 1972 respectively, forming very important sections of the First Trunk Road System. When the Sibu - 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 Rejang 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 50 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 with longboats or small vessels.

1-3-4 Airways

The air transport network covers major towns and several important rural communities scattered in the remote interior which are not served by roads or are inaccessible by water. Though there are a total of 7 airports and number of airfields, those other than Kuching, Sibu, Bintulu and Miri are extremely small and only Kuching and Miri can facilitate aircraft of the Boeing 737 class, while Sibu and Bintulu can only accommodate 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 masterplan study is underway regarding the relocation of Limbang, Sibu and Bintulu airports.

1-4 Industrial Activities

1-4-1 Agriculture

(1) Outline

According to the census taken in 1970, about 60% of the total labor force is engaged in agricultural industries, the share of the GDP which 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 shown 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, some rubber and more recently 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 infrastructures 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 labor force making 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 subsidy 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	3,625	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	3,385	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 based on the traditional "slash-and-burn cultivation" method, in spite of its low productivity compared with wet paddy rice. 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 achieve this end the Paddy Production Unit was established in 1973. The unit has performed several research works aimed 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 cultivation methods and securing an adequate labor force.

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

Table 1-13 Deficit/Surplus of Rice for Sarawak

Year	Local Production		Import		Total Consumptions (Tons)	Population (No.)	Per Capita Consumption (Kg.)
	Paddy (Tons)	Rice Equiv. (Tons) 1/	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 = 0.62 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 labor 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 growth. The Government therefore subsidizes farmers who are in need 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 entire 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 190,000ha. 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 in 1970-1972.

Table 1-14 Estimated Area of Rubber

(ha)

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

Although oil palm has 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 was started at the beginning of 1970 by the Commonwealth Development Corporation. It 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 constrast 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.

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

Timber processing industries in the area chiefly consist of: sawing (for export, domestic comsumption or secondary proces-

sing); 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 Sibu 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.

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

1-4-3 Manufacturing

(1) Outline

Manufacturing industries in Sarawak registered a share of only 6% of GDP in 1975, indicating 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 labor 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.

The industries in the Study Area can be roughly divided into two types. The first group exports primarily processed goods while the second manufacturers 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, Sibu, Miri and a few other places where the infrastructures and utilities have relatively better development.

Table 1-17 Outline of Manufacturing Sector, 1974, Sarawak

Industry	No. of Establishments 1/	Gross Value of Output (M$000)	Value Added (M$000)	Employment	
				Total	Full-time 2/
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 Fabricated 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

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, not being labor 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 towns such as Kuching, Shibu, and Miri is expected to accelerate, and generally import substitution type of industries including food processing, furniture manufacturing etc. and 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 Allocated (ha)	Area Still Available (ha)	Annual Rent (M$/ha)	Lease Period (Years)	Distance from Town (km)
Pending (Kuching)	483	296	106	840	60	6.4
Piasau (Miri)	33.6	17.4	4.5	618	60	7.2
Limbang	9.7	nil	9.7	N.A.	60	5.6
Upper Lanang Road (Sibu)	89	29.5 1/	48.2	741	60	6.4
Semariang(Kuching)	48.6	1.2 1/	11.3	N.A.	60	6.4
Bintulu 2/	101	nil	89	N.A.	60	9.7

Source: Sarawak Economic Development Corporation

1/ Already developed

2/ Being reconsidered and to be increased under Bintulu Regional Planning Stady

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$ milion)	Quantity (long tons)	Value (M$ milion)	Quantity (long tons)	Value (M$ milion)
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.

Chapter 2

PRESENT AND FUTURE STATE OF THE STUDY AREA

Chapter 2 PRESENT AND FUTURE STATE OF THE STUDY AREA

2-1 Outline of the Study Area

2-1-1 Location

The Study Area, as shown Fig. 1-1 and Fig. 2-1 is located in the northern part of Sarawak and is composed of a part of Miri District and Baram District in the Fourth Division, and Limbang District in the Fifth Division. These districts, in terms of administration, are further divided into a number of sub-districts. The following lists the sub-districts within the boundary of the Study Area.

Sub District	District	Division
Miri S/Dist.	Miri Dist.	4th Division
Sibuti S/Dist.	"	"
Baram S/Dist.	Baram Dist.	"
Bakong S/Dist.	"	"
Baram Tengah S/Dist.	"	"
Baram Ulu S/Dist.	"	"
Limbang S/Dist.	Limbang Dist.	5th Division
N. Medamit S/Dist.	"	"

The Study Area roughly covers 28,000 km^2 (about 10,800 mile^2), comprising 22% of the entire area of Sarawak.

2-1-2 Physical Structure

Topographically, the Study Area can be categorized as follows.

(1) Alluvial plains: areas characterized by flat or very gently sloping land occuring in the lower Baram and Tinjar river system and in the lower Limbang river. Areas of flat or very gently sloping land are limited due to generally rather eroded terraces which, however, occupy only small areas.

(2) The lowlands: these areas range between sea level and 90m (300 feet) and generally short to moderately steep slopes with undulating to rolling terrain. The area consists mainly of land with high agricultural potential.

(3) The uplands: at altitudes ranging between 90m and 180m

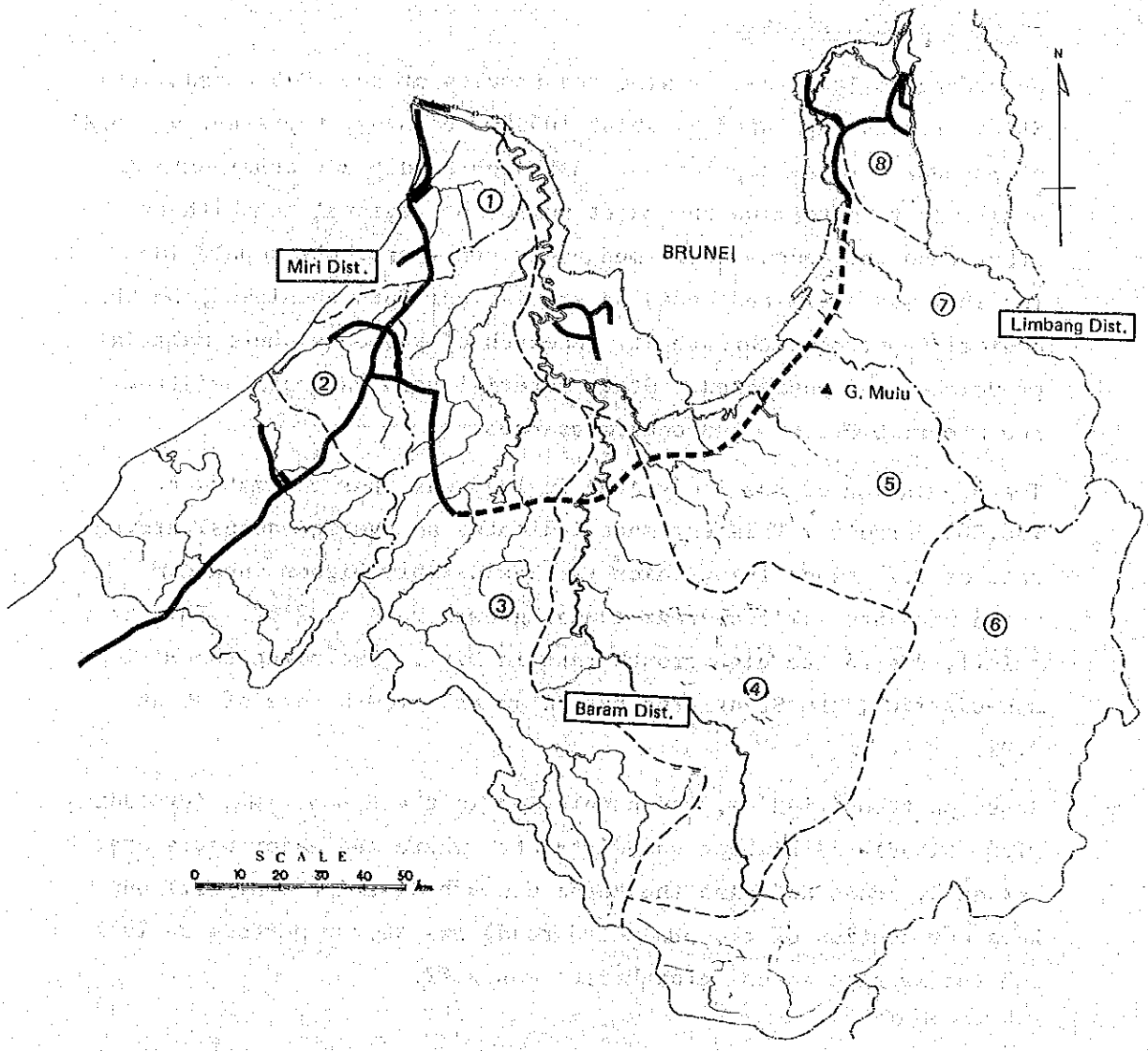
(300 to 600 feet), this area is characterized by long steep slopes and deep narrow river valleys with hilly terrain. Only quite limited areas of land have agricultural potential.

(4) Highlands: ranging in altitude from 180m (600 feet) to over 2,096m (7,000 feet) in the Tamabu mountain range, the area is characterized by very steep slopes with severe dissection and deeply incised drainage. Since the terrain is very hilly to mountainous, if contains virtually no land with agricultural potential, the exception being some limited segments in the Bario areas.

Within the boundaries of the Study Area there are two major river systems (the Limbang in the north and the Baram in the south) of which the Baram has tributaries of considerable size, such as the Tinjar, Tutoh/Apoh and Bakong. Most rivers are prone to flash flooding especially in their middle and upper reaches.

Due to the influences of the topographic features outlined above, the distribution of farming lands and communities are spread rather widely over the flat areas. Where rivers provide the only means of transport, a concentration of communities along these waterways is common with the practice of "shifting cultivation" prevailing among these communities. Roads in Miri, rivers in Baram District and both rivers and roads in Limbang District serve as major transport channels along which agricultural and community developments are observed.

Fig. 2-1 LOCATION OF ADMINISTRATIVE BOUNDARY IN THE STADY AREA



① Miri Sub-district
② Sibuti S/D
③ Bakong S/D
④ Baram Tengah S/D
⑤ Baram S/D
⑥ Baram Ulu S/D
⑦ N. Medamit S/D
⑧ Limbang S/D

District Boundary
Sub-district Boundary
Existing Major Roads
Project Road

2.2 Population/Communities

2-2-1 Population Distribution

According to Table 2-1 showing the results of the 1970 census, the Study Area is populated by about 105,500 persons, representing 10.8% of Sarawak's total population. Although hardly any other data is available to determine the exact number of regional inhabitants, other than the census performed every ten years, the population for 1977 was estimated based on statistical data obtained from the Medical Department through its research of kampongs where malarial prevalence was suspected. Other material used was obtained from the District Offices and others sources.

The population of the Study Area in 1977 was thus estimated at 136,000 persons. This estimate indicates an average annual growth rate of 3.7% since 1970, which is considerably higher when compared with Sarawak's average annual growth rate of 2.6%. This is chiefly due to the high growth rate in Miri. Excluding the Miri sub-district, the Study Area has an annual growth rate of about 2.9%.

Based on these figures, the population in the Study Area, (excluding Miri, Sibuti and Limbang sub-districts, where the major parts are served by roads and also the Baram Ulu sub-district that will not have any section of the projected road) was 48,200 persons in 1977 and the average annual growth rate was 2.5%.

2-2-2 Racial Composition

The Study Area is populated by a number of different races with Chinese composing the largest share and accounting for 28.5%, followed by Ibans (23.0%) and Malays (18.1%). Together, these races account for about 70% of the total population: a ratio similar to that for the whole of Sarawak. The indigenous races prevalent in the area other than the Iban are the Kayan, Kenyah, Bisaya, Kedayan, Penan, Kelabit etc.

Table 2-1 Distribution of Population by Sub-district

Sub-district	Area Sq. km.	Area (%)	Population 1970	(%)	Population 1977	(%)	Density 1977 (Ps./sq.km.)	Annual Growth Rate (%)
Miri	961	(3.4)	35,702	(33.8)	50,700[1/]	(37.3)	52.8	5.14
Sibuti	997	(3.6)	10,483	(9.9)	12,900[2/]	(9.5)	12.9	3.01
Bakong	5,489	(19.6)	12,602	(11.9)	16,000[3/]	(11.7)	2.9	3.47
Baram Tengah	4,857	(17.4)	7,287	(6.9)	9,000[3/]	(6.6)	1.9	3.06
Baram	4,870	(17.4)	13,768	(13.1)	17,000[3/]	(12.5)	3.5	3.06
Baram Ulu	6,830	(24.4)	5,851	(5.6)	6,200[3/]	(4.6)	0.9	0.83
N. Medamit	2,990	(10.7)	5,300	(5.0)	6.200[3/]	(4.6)	2.1	2.27
Limbang	986	(3.5)	14,507	(13.8)	18,000[3/]	(13.2)	18.3	3.13
Total	27,980	(100.0)	105,500	(100.0)	136,000	(100.0)	4.8	3.69
Excluding Miri, Sibuti, Limbang and Baram Ulu	18,206	(65.1)	38,957	(36.9)	48,200	(35.4)	2.5	3.09

1/ Estimated as follows:

	1970	1977	Annual Growth Rate (%)
Miri/Lutong	27,021	40,000	5.8 *
Other Areas	8,681	10,700	3.0 **
Miri Sub-district	35,702	50,700	5.1

* Actual Growth Rate

** Assumption

2/ Estimated based on the assumed growth rate of 3.0%. Annual growth rate of 4th Division between 1960 and 1970 was 3.5%.

3/ Estimated based on the population survey being carried out by Medical Department.

Regions other than the Study Area have considerable and characteristic racial compositions with the major inhabitants being Chinese and Malays in Miri, Ibans followed by other indigenous races such as the Kayan, Kenyah and so on in Baram, and with Malays, Ibans, Chinese, Bisaya and Kedayan in Limbang.

In Sarawak, the races differ in their outlooks towards vocation, modes of living and customs.

Table 2-2 Population Distribution by Race, 1970

(Unit: %)

Sub-district	Malay	Melanau	Sea Dayak (Iban)	Land Dayak (Bidayuh)	Other Indigenous	Chinese	Others
Miri	26.1	4.4	7.6	0.7	2.9	56.2	2.1
Sibuti	15.2	2.7	48.0	0.2	19.2	14.4	0.3
Baram, Bakong, Baram Tengah, Baram Ulu	5.7	0.3	30.2	0.1	49.7 1/	13.6	0.4
N. Medamit, Limbang	30.0	0.2	23.0	0.3	30.2 2/	16.0	0.3
Study Area (Population):	18.1 (19,100)	1.9 (2,026)	23.0 (24,245)	0.4 (383)	27.1 (28,662)	28.5 (30,097)	0.9 (987)
SARAWAK (Population):	18.7 (182,709)	5.5 (53,234)	31.1 (302,984)	8.5 (83,276)	5.1 (49,960)	30.1 (294,020)	1.0 (9,735)

1/ Including Kayan : 17.6%, Kenyah : 16.7%, Kelabit : 5.1% and Penan : 5.6% etc.

2/ Including Bisaya : 14.3%, Kedayan : 11.4%, Murut : 2.4% and Kelabit/Tabun : 2.3% etc.

Source : Annual Statistical Bulletin Sarawak and information from the District Office.

2-2-3 Urban Areas/Communities

(1) Size and Distribution of Communities

In the Study Area, Miri, Marudi and Limbang are the only three that can be called cities in terms of their function and size. There are also three urbanized areas: Long Lama, N. Medamit and Beluru. Other than these areas, most of the communities consist of kampongs or long houses which mainly function only as a base for farming and habitation. Table 2-3 shows the number of towns/-kampongs by population size in Limbang and Baram Districts. According to the table, most of the communities are populated with less than 500 inhabitants, with 45 to 50% of the total number of kampongs having less than 100 inhabitants. Kampongs with a population of 500 or more in Baram District are listed in Appendix Table A-2-2.

The map in Fig. 2-2 shows the distribution of kampongs. Most of them being concentrated along roads or rivers.

Fig. 2-2 LOCATION OF KAMPONGS BY POPULATION

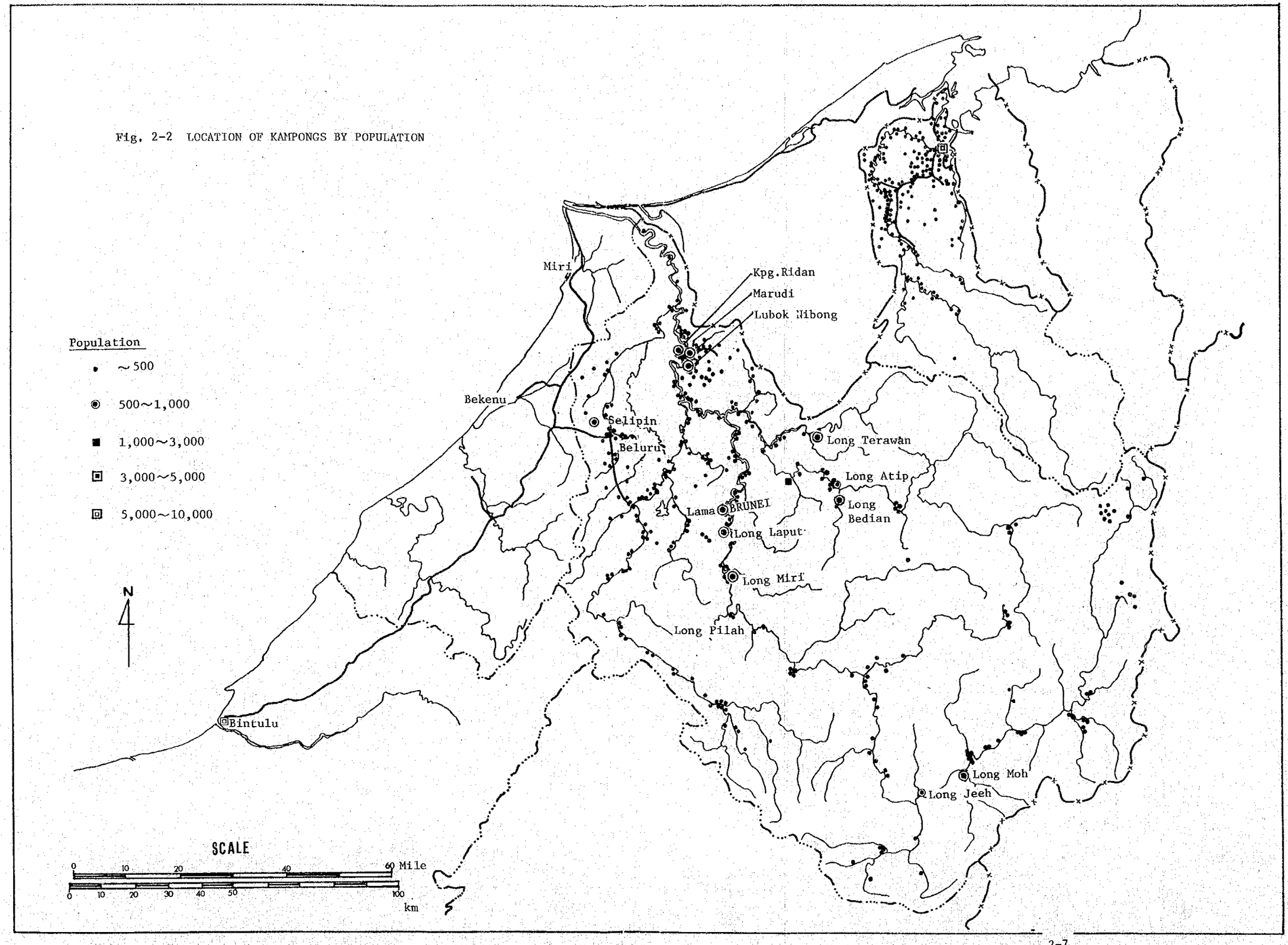


Table 2-3 Number of Town/Kampongs in Baram Limbang Districts by Population, 1977

Population	Baram Dist.		Limbang Dist.	
	Number	(%)	Number	(%)
1 - 99	128	44.3	73	49.3
100 - 199	80	27.7	51	34.5
200 - 299	37	12.8	16	10.8
300 - 399	24	8.3	6	4.1
400 - 499	6	2.1	1	0.7
500 - 599	5	1.7	0	0
600 - 699	3	1.0	0	0
700 - 799	2	0.7	0	0
800 - 999	1	0.3	0	0
1,000 - 2,999	2	0.7	0	0
3,000 - 4,999	0	0	0	0
5,000 - 9,999	1	0.3	1	0.7
10,000 -	0	0	0	0
	289	(100.0)	148	(100.0)

Source: Worked out by the Consultant based on the information provided by the Government Departments

(2) Outline of Major Cities

Over the period from 1960 to 1970, Sarawak's urban population has grown from 12.6% to 16.7%. This means a growth of 1.73 times from 93,810 to 162,396 persons and an annual average growth rate of 5.6%. A similar trend is observed in the Study Area. As summarized in Table 2-4, the population influx into Miri has been accelerating since 1970. Even Marudi and Long Lama which are inaccessible by road show higher growth rates than that for the whole of Sarawak.

The high population growth rates of Marudi and Long Lama, however, are mainly due to the increase in the number of students resulting from the Government policy of providing higher educational opportunities in these isolated areas. The population excluding that of students remains almost unchanged.

Table 2-4 Population of Major Centres

Area / Settlement		1960	1970	1977	Annual Growth Rate (%) 10/ 1960-70	1970-77
Urban	Miri/Lutong	16,222 1/	27,021 1/	40,000 2/	5.2	5.8
	Marudi	2,663 1/	3,910 1/8/	5,000 3/7/	3.9 (2.5)	3.6 (0.8)
	Limbang	n.a.	n.a.	8,000 4/	-	-
Semi-Urban	Long Lama	496 1/	902 4/5/	1,512 9/6/	6.2 (4.4)	5.3 (Δ0.6)
	N. Medamit	n.a.	100 4/	378 4/	-	21.0
	Beluru	n.a.	330 4/	472 4/	-	5.2
	Total	n.a.	n.a.	55,362	-	-

1/ Miri-Bintulu Regional Study
2/ Information Office, Miri
3/ Estimated on the basis of information collected from District Office, Police Office etc., in Marudi
4/ Medical Department, Limbang
5/ Including 136 Secondary School Students
6/ Including 773 Secondary School Students
7/ Including 1,400 Secondary School Students
8/ Including 500 Secondary School Students
9/ District Office, Marudi
10/ Figures in parenthesis is the Population growth rate excluding the number of Students

1) Miri

Miri is the third largest city in Sarawak, and together with Lutong, which is located nearby, has a total estimated population of about 40,000. Miri has been expanding due to the oil and natural gas developments taking place off its coast. In addition, due to regional development focusing on agriculture progress, the city has diversified its functions and, is playing an increasingly important role in the local economy for distribution of goods and other commercial activities. The administrative offices of the Fourth Division government are located in the city. The planning policies to improve Miri are aimed at balanced regional development by decentralizing the present population and accompanying functions which are now concentrated in limited areas such as at Kuching and Sibu. In accordance with this program, various survey and research activities are being carried out such as for the construction of a deep sea port at Tg. Kidurung, and also, for the hinterland development of the Bintulu area. The port of Miri, as many other ports in Sarawak, has sand bars and shallows which impede the port's functions and facilities, and prevent vessels of large sizes from docking for cargo handling. The projected port close by to Bintulu,

located about 230 km (144 miles) by road from Miri, will greatly improve the cargo handling conditions.

The hinterland of Miri abounds in forest resources, with about 50% of the round timber exports for the whole of Sarawak coming from this area. Industries of various sectors led by timber related industries is gradually increasing along with related infrastructures, and it is considered that the population growth, now at a rate of about 5.8%, will continue for quite some time into the future.

2) Marudi

The town of Marudi serves as the administrative and distribution centre of the Bg. Baram river basin.

With K. Baram situated close to the river mouth, Marudi is located some 110 kms (69 miles) further upstream and is active in the out going distribution of farm products produced in upstream areas and also as a distributor of goods coming into these upstream areas through the present port, handling vessels with loading capacities of up to 500 tons, plying between areas of Sarawak and foreign destinations.

With an estimated population of about 5,000, Marudi has other economic activities (apart from its commodity distribution) such as rubber culture, agricultural and timber processing industries. In addition Marudi also has a secondary school with 1,400 students, along with about 50 commercial facilities such as hotels, markets and retail shops. In terms of transportation, express launch services are available to and from K. Baram and Long Lama, with regular air flights available to and from Marudi; both can be expected to expand services at a constant rate due to the forestry development that is becoming increasingly active in the Baram river basin providing that the Project Road is not realized. With the Project Road completed, however, Long Lama is expected to take over many of the present functions of Marudi.

3) Long Lama

Long Lama is located further upstream, about 115 km (72 miles) from Marudi and 225 km (141 miles) from K. Baram. The township developed from one of the more active longhouses which was located on the

opposite side of the river from the present town. The town has grown from the Bazaar which was initiated in the 1920s to its present size. The population is estimated at around 1,500 persons. The town facilities include a branch of Divisional Office, a hospital, primary and secondary schools, and about ten retail shops. The only transportation means to and from other areas is a daily express launch service operating in both directions, with requiring about five hours in travel time each way. The town functions as a commodity distribution centre and also provides opportunities for secondary education, but to a lesser extent than Marudi.

Vessels with capacities of 200 to 300 tons can call at Long Lama without navigational difficulty. In the future Long Lama is expected to grow in importance due to the expansion of forestry development in the interior areas.

The town will be greatly influenced by the Project Road, when completed, since the Road will greatly reduce the travel time to Miri from two days by river at present, to 2 to 3 hours over the 132 kms (82.5 miles) Project Road.

Consequently, it is considered that Long Lama will share many of the urban functions which Marudi now has, along with changing the requirements for industrial location.

4) Limbang

Although Limbang is the administrative centre of the Fifth Division, it is isolated due to the non-existance of roads and only a very limited air service. On the other hand, it is at only about 20 minutes travel time by speedboat between Brunei where a road leads to Miri. With a long history of close relations, the tow areas have enjoyed an interchange of both commodities and people. Limbang's estimated population is about 8,000, with the town providing various social and economic services through its administrative institutions, schools, hospitals, and various commercial facilities (about 75 shops). Its port, like others in Sarawak, suffers from the existance of sand bars and shallows limiting the size of vessels which can enter. At present, most of the vessels utilizing the port have capacities of 200 to 300 tons, but even

such ships experience great difficulty in entering during the "landas" season.

2-2-4 Estimation of Future Population

This section deals with projection of the future population of the Study Area estimated on the basis of past trends. The basic concepts and assumption for estimation are as follows:

(1) It was assumed, as shown in Appendix Table A-2-3, that Sarawak as a whole will have differing growth rates for in the future: 2.5%/year for 1977-85, 2.4%/year for 1985-95 and 2.3%/year for 1995-2005. The population of each division was calculated assuming that it will grow following the trend of the period from 1960 to 1970 and that the total of the estimate will equal the total population of Sarawak, estimated at the abovementioned rates.

(2) Although the Study Area has a higher growth rate than other areas in the Fourth and Fifth Divisions due to the high growth rate in Miri, it is assumed that the share of the Study Area in the Fourth and Fifth divisions will become constant after 1995 since the population concentration will accelarate in Bintulu from that time on.

(3) The population of each Sub-district within the Study Area was estimated based on the assumption that their respective growth rates will remain the same or similar in the future.

According to Table 2-5 showing the estimates thus obtained, Miri will increase further to reach a level of 106,000 in 1995. In the year 2005, it will expand to 153,100 and represent about 50% of the total population of the Study Area. Following Miri, the populations of Bakong, Baram Tengah, Baram and Limbang are expected to grow at relatively higher rates. N. Medamit will have a moderate growth rate while the population of Baram Ulu will most likely remain constant.

Table 2-5 Forecast Population in The Study Area

Sub-district	1977		1985		1995		2005		Average Annual Growth Rate (%)		
	Popul. (000)	(%)	Popul. (000)	(%)	Popul. (000)	(%)	Popul. (000)	(%)	77-85	85-95	95-05
Miri	50.7	(37.3)	72.1	(41.3)	106.5	(46.0)	153.1	(50.7)	4.50	3.96	3.70
Sibuti	12.9	(9.5)	15.7	(9.0)	19.1	(8.3)	22.7	(7.5)	2.49	1.98	1.75
Bakong	16.0	(11.7)	20.2	(11.6)	25.9	(11.2)	32.4	(10.7)	2.96	2.51	2.26
Baram Tengah	9.0	(6.6)	10.9	(6.2)	13.6	(5.9)	16.4	(5.4)	2.43	2.22	1.89
Baram	17.0	(12.5)	20.6	(11.8)	25.2	(10.9)	30.0	(9.9)	2.43	2.04	1.76
Baram Ulu	6.2	(4.6)	6.3	(3.6)	6.4	(2.8)	6.4	(2.1)	0.21	0.12	0.00
N. Medamit	6.2	(4.6)	7.0	(4.0)	7.8	(3.4)	8.5	(7.8)	1.53	1.08	0.87
Limbang	18.0	(13.2)	21.9	(12.5)	27.0	(11.7)	32.5	(10.8)	2.48	2.10	1.88
Study Area	136.0	(100.0)	174.7	(100.0)	231.5	(100.0)	302.0	(100.0)	3.18	2.84	2.69
4th + 5th Division	211.8		266.3		350.7		457.5		2.91	2.84	2.69
% of 4 + 5 Division		(64.2)		(65.6)		(66.0)		(66.0)			

Table 2-6 below gives an estimate of the future population for major urban centers. The calculation used growth rates based on their past growth rates and developmental characteristics.

Table 2-6 Forecast Population of Major Urban Centres

Urban Centre	1977	1985	1995	2005	Average Annual Growth Rate (%) 77-85	85-95	95-05
Miri/Lutong	40,000	59,700	91,300	135,200	5.17	4.37	4.00
Marudi	5,000	5,700	6,600	7,300	1.68	1.50	1.02
Limbang	8,000	10,000	12,600	15,400	2.85	2.37	2.03
Long Lama	1,500	2,000	2,700	3,300	3.67	3.15	2.02
Beluru	380	540	790	1,100	4.52	3.93	3.38

2-3 Agriculture

Agricultural activities in the Study Area are mostly small-scale operations utilizing widespread traditional agricultural methods with the exception of oil palm cultivation in Bukit Peninjau and Danau in the Limbang area. The areas along the Project Road have serious handicaps for their agricultural development since they are mostly located far from markets, covered to a large extent with jungle, and are sparsely populated. In this section, the current state of agricultural production in the Study Area is outlined along with the discussion of the feasibility for future development.

2-3-1 Agricultural Production

(1) Paddy

Table 2-7 shows the extent of paddy production in the Study Area. In 1977 production included about 17,000 tons of wet paddy and about 10,000 tons of hill paddy, accounting for 17% and 20% respectively of the total production for Sarawak. About 85% of the paddy cultivation in the Study Area is concentrated in Baram and Limbang (80% for wet paddy and 90% for hill paddy). The paddy production in these districts shows that the yield per acre under cultivation was higher than the average for Sarawak by about 30% for both wet paddy and hill paddy.

Table 2-7 Paddy Production in The Study Area

	Miri		Baram		Limbang		Total	
	1975/76	1976/77	1975/76	1976/77	1975/76	1976/77	1975/76	1976/77
Wet Paddy								
Area Planted (ha)	1,102	1,214	4,026	4,160	2,311	2,236 1/	7,439	7,610
Area Harvested (ha)	1,034	1,174	3,574	4,100	2,033	1,642 1/	6,641	6,916
Production (tons)	2,985	3,266	8,984	10,501	4,951	3,422 1/	16,920	17,189
Yield (ton/ha)	2.89	2.78	2.51	2.56	2.44	2.08 1/	2.55	2.49
Hill Paddy								
Area Planted (ha)	901	882	5,787	6,077	2,025	2,120	8,713	9,079
Area Harvested (ha)	878	842	5,787	6,077	2,025	2,120	8,690	9,039
Production (tons)	1,024	1,070	6,080	5,429	3,036	3,154	10,140	9,653
Yield (ton/ha)	1.17	1.27	1.05	0.89	1.50	1.49	1.17	1.07
Total								
Area Planted (ha)	2,003	2,096	9,813	10,237	4,336	4,356	16,152	16,689
Area Harvested (ha)	1,912	2,016	9,361	10,177	4,058	3,762	15,331	15,955
Production (tons)	4,009	4,336	15,064	15,930	7,987	6,576	27,060	26,842
Yield (ton/ha)	2.09	2.15	1.61	1.57	1.97	1.75	1.77	1.68
Average Yield of Whole State (ton/ha)	1975/76 :		Wet Paddy = 1.91 Hill Paddy = 0.80					

Source: District Agricultural Annual Report

1/ Significant decrease is due to serious flood.

In the Limbang and Baram areas, rice production equals or exceeds the demand in the respective areas with surpluses being transported to Miri for urban consumption. Table 2-8 shows the regional supply and demand balance of paddy estimated from the tonnages produced and imported. The table, shows that the First and Third Division suffer with a deficit while the Fourth and Fifth Division have a supply and demand ratio that is fairly balanced. Further details regarding the paddy in the Study Area will be discussed later in Section 3, Chapter 4.

Table 2-8 Regional Supply/Demand Balance of Rice, 1976

Division	Production (Tons)		Population (No.)	Presumed 2/ Consumption (Tons)	Deficit/ Surplus (Tons)	Import of Rice (Tons)
	Paddy	Rice 1/ Equiv.				
FIRST	17,186	10,655	411,000	56,924	Δ 46,269	36,815 (Kuching)
SECOND	39,660	24,589	156,000	21,606	2,983	-
THIRD	8,827	5,473	192,000	26,592	Δ 21,119	26,348 (Sibu)
FOURTH	36,888	22,871	166,000	22,991	Δ 120	40 (Miri)
FIFTH	10,866	6,737	42,000	5,817	920	-
SIXTH	23,973	14,863	107,000	14,820	43	-
SEVENTH	13,673	8,477	58,000	8,033	444	-
TOTAL	151,073	93,665	1,132,000	156,782	Δ 63,118	63,203

1/ 1 ton of paddy = 0.62 ton of rice

2/ Calculated based on the per capita consumption of 138.5kg.

(2) Rubber

There are two rubber plantations: one in the suburbs of Miri and the other in the suburbs of Limbang. In Baram District where sections of the Project Road lie, no estate type cultivation exists while what rubber there is, is mostly produced by farmers on a very small scale. This limited cultivation is due to limited land suitable for growing rubber, and also the shortage of labor. Table 2-9 shows the amount and acreage under cultivation for various areas in 1977. From this, the present level of production is estimated to be approximately 6,500 tons, of which the majority is exported. Appendix Table A-2-4 gives the export tonnage by port. The reasons why the export tonnage is smaller than the productuon is because some of the product is transported to Kuching by road.

Table 2-9 Rubber Production in the Study Area, 1977

Area	Ordinary				High Yielding			
	Acreage (ha)		Yield	Produ.	Acreage (ha)		Yield	Produc.
	Mature	Immature	(lb/tree)	(tons)	Mature	Immature	(lb/tree)	(tons)
Miri	4,087	n.a.	4 - 6	n.a.	1,963	300	12 - 14	n.a.
Baram	1,497	210	6	810	4,124	1,021	14	1,640
Limbang[1/]	4,450	n.a.	6	n.a.	750	n.a.	8	n.a.
Total	10,034	n.a.	4 - 6	n.a.	6,837	1,321	8 - 14	n.a.

Source; District Agricultural Annual Report

1/ Figures are those of 1976, production in 1975 was 1,738 tons including both ordinary and high yielding types.

(3) Pepper

Although pepper has a high profitability compared with other farm products, it does require a high labor input resulting in high costs and, furthermore, no income can be gained in the first three years of its planting. Therefore pepper cultivation cannot be attempted without ample funds. In view of this and the governmental plans to increase its production, farmers without enough funds are subsidized, allowing them to purchase tools, materials, and fertilizers. The amount of pepper produced in the Study Area (in the range of 1,200 tons), as shown in Table 2-10, is only a small percentage of the total tonnage from Sarawak. Even so, the pepper crop is expected to increase in the Study are from now on, encouraged by the subsidy scheme, the introduction of adequate production guidance, and the high suitability of land once used for "shifting cultivation" which contains potassium and other nutritive elements.

Table 2-10 Pepper Production in the Study Area, 1977

Area	Acreage 1/ (ha)			Yield	Production (Tons)		
	Mature	Immature	Total	(lb.)	Black	White	Total
Miri	145.7	99.2	244.9	12-16	95	460	555
Baram	145.0	80.1	235.1	13	305 3/	260 3/	565 3/
Limbang	77.6	60.8	138.4	6-8	55 3/	29 3/	84 3/
Total	378.3	240.1	618.4		455	749	1,204

Source: District Agricultural Annual Report

1/ 1 acre = 800 vines or 1 ha = 1977 vines
2/ lb. green berries per mature vine
3/ Figures are those of 1975

(4) Others

Other than the foregoing, the Study Area Produces agricultural crops as listed in Table 2-11. An Agricultural Diversification Scheme has been introduced in order to stabilize the fluctuation of agricultural household income by diversifying crops. In accordance with the scheme, SLDP succeeded in introducing oil palms, while the culture of other perennial and annual crops, such as cashew nuts, sago palms and fruit crops, was encouraged by the subsidy system.

Table 2-11 Production of Other Agriculture Crops in the Study Area, 1977

Crops	Miri	Baram	Limbang[3/]
Coconut;			
Acreage (ha); Mature	2,873	-	2,592
Immature	830	-	6,646
Yield (No. of nuts per ha)	202	-	80-100
Production (No. of nuts)	71,000	-	128,080
Oil Palm;			
Acreage (ha); Mature	n.a.	-	273
Immature	649[1/]	-	-
Yield (tons fresh fruit/ha)	n.a.	-	n.a.
Production (tons fresh fruit)	n.a.	-	n.a.
Sago;			
Acreage (ha); Mature	-	-	192
Immature	-	-	249
Yield (ton/ha)	-	-	n.a.
Production (tons)	-	-	n.a.
Cocoa;			
Acreage (ha); Mature	70	12	-
Immature		40	3,000[2/]
Yield	n.a.	n.a.	-
Production (tons)	n.a.	n.a.	-
Maize;			
Acreage (ha)	796	534	783
Yield (kg/ha)	(560)	990	n.a.
Production (tons)	50	528	n.a.
Other Crops;	Fruit trees, Clove, Cashewnut, Nutmeg, Coffee, Groundnuts, Ginger, Water-melon, Vegetables etc.	Fruit trees, Coffee, Sugarcane, Groundnut etc.	Fruit trees, Clove, Cashew-nut, Nutmeg, Soyabean, Groundnut etc.

Source: District Agricultural Annual Reports

1/ Includes small holders only
2/ No. of trees
3/ Figures are those of 1976

(5) Livestock

Table 2-12 shows the livestock population in Miri, Baram and Limbang Districts including the Study Area. Pigs accounting for 68% of the total, are the most important type of livestock, in the whole of Sarawak, and are raised throughout the Study Area. Subsidy schemes have been adopted for cattle, buffaloes and goats in the hopes of increasing production.

Table 2-12 Livestock Population in the Study Area, 1977

District	Cattle	Buffaloes	Pigs	Goats	Total
Miri	2,683	215[1/]	11,987[2/]	659[3/]	15,544
Baram	434[4/]	1,000[5/]	7,794[2/]	199[3/]	9,427
Limbang	200	3,355	895[2/]	763[3/]	5,213
Total	3,317	4,570	20,676	1,621	30,184

Source: Veterinary Annual Report for 4th & 5th Divisions, 1977

1/ Mostly found in Sibuti areas

2/ More or less evenly distributed in the areas

3/ Mostly found in coastal areas

4/ 90% found in Bario areas

5/ Nearly all are found in Bario areas

2-3-2 Agricultural Development Potentials

(1) Problems in Development

Little information could be obtained regarding the potentialities for agricultural development along the Project Road. The major source of data is the Miri-Bintulu Regional Survey Report giving the results of the soil survey conducted by the Department of Agriculture. In the case of interior areas especially, only limited research has been attempted due to the very low accessibility and consequent difficulties. Agricultural Development in the interior areas along the Project Road is greatly handicapped mainly due to the following:

a) Topographic Restrictions: the areas have hilly and mountainous topography, and are mostly covered by jungle. Flat parts are generally swampy with peat deposits and bad draining conditions. Hilly terrain has slope gradients of 10° to 35° and limited flat portions. Those with steeper gradients have outer layers that have been greatly eroded.

b) Insufficient Soil nutriments: the areas are covered by tropical rain forests having high temperatures and humidity. The soil is very acidic as well as lacking in organic nutriments.

c) Lack of transport: the areas depend totally on rivers for transportation which causes great difficulty to transport goods to markets, replenish agricultural inputs, such as fertilizers, chemicals, farming tools etc., and to have agricultural techniques introduced.

d) Lack of Labor: most of the Study Area suffers from low population density. Large-scale development projects will have serious problems in obtaining sufficient labor force and the oil palm culture in Bukit Peninjau has already encountered difficulties due to this factor. In the case of the Limbang Valley Development Project, a labor obstacle is also expected. Moreover modern agricultural methods face problems in being accepted by the tradition-bound people in the interior.

(2) Agricultural Development Potential Areas

Distribution of agricultural development potential areas in the Study Area, particularly those along the Project Road is discussed in two reports: one of the Department of Agriculture and the other, the Miri - Bintulu Regional Study Report. In the former report, the agricultural potential areas were selected by carrying out field surveys based on aerial photos taken in 1964, by semidetailed soil surveys and by excluding areas unsuitable for cultivation such as swamps and hilly/mountainous terrains with slope gradients steeper than 35°.

Fig. 2-3 shows the location of the agricultural development potential blocks. Those located in the areas along the Project Road are summarized in the Table 2-13. The table indicates that completion of the Project Road will allow access to approximately 82,000 ha for cultivation. Further description of the blocks selected by the Department of Agriculture such as Nos. 8 through 10 and 12 through 18 is presented in the Appendix Table A-2-5 and Appendix Fig. A-2-1.

Though some blocks are at present being cultivated to some extent, most of them are left untouched due to their very poor accessibility.

The Limbang Valley Development Project aims at developing approximately 27,000 hectars of potential land for wet paddy cultivation by introducing good drainage and irrigation systems. Since August 1978, a feasibility study by the Belgium Survey Team has been underway. Although the details of the Project will not be known until the completion of the study in about two years, it is expected to show that the flat alluvial land sandwiched in-between the Sg. Limbang and Brunei river is suitable for paddy cultivation. The results of the field survey carried out by the Survey Team also suggest this conclusion.

Table 2-13-(1) Potential Areas for Agricultural Development in The Project Road Influence Area Identified by Dept. of Agriculture

Block No.	Name of Block	Arable Area (ha.)	Present Cultivation	Suitable Cultivation
8.	Bain-Lama	8,782; 53% under primary forest	Largely hill rice, partly rubber gardens close to villages	Cultivation of dry land, annual and perennial crops
9.	Selemen-Aroh	3,480; 28% under primary forest	Mainly hill rice with seedling rubber gardens close to villages	- do -
10.	Maloi-Tabih	3,035; 91% under primary forest	Mainly hill rice and rubber	- do -
14.	Berei Selemat-West	2,914; 85% under primary forest	Hill rice in the west	- do -
15.	Berei Selemat-East	607; all under primary forest	nil.	Cultivation of dry land, annual and perennial crops but mostly marginal
12.	Terawan-East	1,012; 96% under primary forest	Hill rice in the north	- do -
13.	Gak	1,457; 94% under primary forest	nil.	- do -
16.	Ulu Terawan	890; all under primary forest	nil.	Cultivation of irrigated crops
17.	Ulat-North	486; all under primary forest	nil.	Cultivation of dry land, annual and perennial crops but mostly marginal
18.	Ulat-South	890; all under primary forest	nil.	- do -
	Total	23,533		

Fig. 2-3 LOCATION OF AGRICULTURAL POTENTIAL AREAS

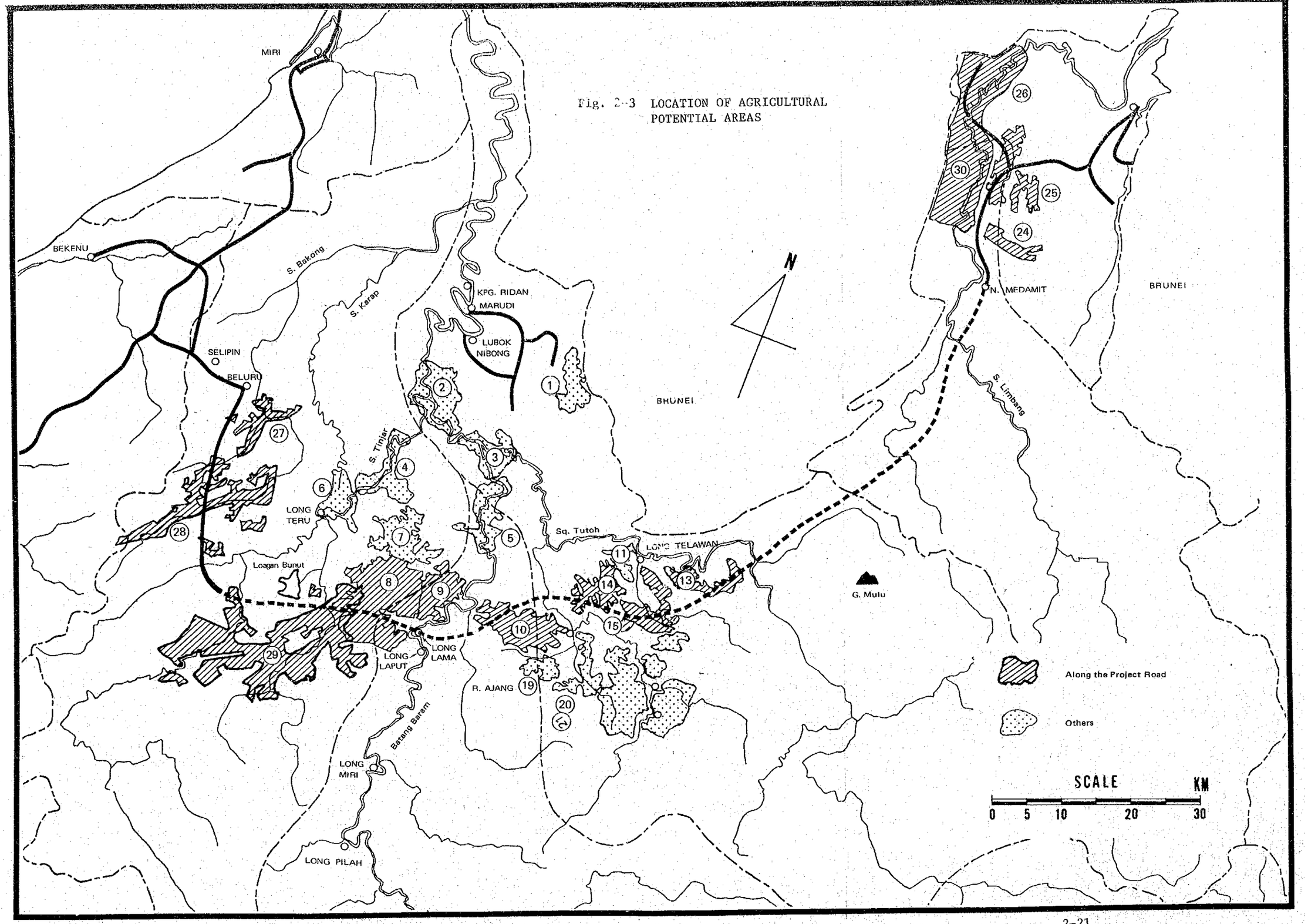


Table 2-13-(2) Potential Areas for Agricultural Development in The Project Road Influence Area Identified by Other Sources

Block No.	Name of Block	Area (ha.)	Suitable Cultivation
24		750	(Rubber)
25		1,050	(- do -)
26		1,200	(- do -)
27		2,100	Improvement
28		7,000	Potential
29		19,100	
30	Limbang Valley	27,000	(Wet Paddy)
	Total	58,200	

2-3-3 Forecast of Agricultural Production

Agricultural production in the Study Area is forecast in two cases: "with" and "without" the Project Road. In the "without" case, the future production was estimated taking account of past trend, probable increase in yields due to the diffusion of various subsidy schemes and technical training, and also the expansion of cultivation areas. In the "with" case, estimates were made assuming that the potential blocks, previously mentioned, will be able to be opened up for cultivation in addition to the production of the "without" case.

(1) Case 1: "Without" the Project Road

Tables 2-14 and 2-15 give the estimate of rice products in the Study Area. Regarding wet paddy, it was assumed that the acreage will increase at an annual rate of 1% from 1977 onwards, with the yield expected to increase a little as well. As to hill paddy, it was assumed that the acreage and yield will not increase since the existing "shifting cultivation" is neither beneficial nor recommendable from the viewpoint of the preservation of forest resources, and it is expected to be controlled more strictly in the future.

Table 2-16 gives the estimates for rubber and pepper production. It was assumed that rubber will not have increased acreage while pepper will have an increase in its acreage of about 1.5% per year and that both will have an increase in yield of 2% per year.

Table 2-14 Forecast Acreage and Production of Wet Paddy in The Study Area

Area		Base year 1977	1985	1995	2005
Miri	Acreage (ha) 1/	1,150	1,245	1,376	1,519
	Yield (ton/ha)	2.80	2.90	3.00	3.00
	Production (tons)	3,220	3,611	4,128	4,557
	Rice Equiv. (tons) 2/	1,996	2,347	2,683	2,962
Baram	Acreage (ha) 1/	4,100	4,440	4,904	5,417
	Yield (ton/ha)	2.50	2.60	2.70	2.80
	Production (tons)	10,250	11,544	13,241	15,168
	Rice Equiv. (tons) 2/	6,355	7,504	8,607	9,859
Limbang	Acreage (ha) 1/	2,000	2,166	2,392	2,643
	Yield (ton/ha)	2.30	2.40	2.50	2.70
	Production (tons)	4,600	5,198	5,980	7,136
	Rice Equiv. (tons) 2/	2,852	3,379	3,887	4,638
Total	Production, Rice (tons)	11,203	13,230	15,177	17,459

1/ Acreage is estimated based on the following increase rate; 1.0% per year.

2/ Rice Equivalent ratio is assumed as follow; 0.62 for 1982 and 0.65 thenafter due to improved practice.

Table 2-15 Forecast Acreage and Production of Hill Paddy in The Study Area

Area		1977	1985	1995	2005	Yield (ton/ha)
Miri	Acreage (ha)	860	860	860	860	1.22
	Production (tons)	1,049	1,049	1,049	1,049	
	Rice Equiv. (tons) 1/	650	650	650	650	
Baram	Acreage (ha)	5,900	5,900	5,900	5,900	1.00
	Production (tons)	5,900	5,900	5,900	5,900	
	Rice Equiv. (tons) 1/	3,658	3,658	3,658	3,658	
Limbang	Acreage (ha)	2,070	2,070	2,070	2,070	1.50
	Production (tons)	3,105	3,105	3,105	3,105	
	Rice Equiv. (tons) 1/	1,925	1,925	1,925	1,925	
Total	Production, Rice (tons)	6,233	6,233	6,233	6,233	

1/. Rice Equivalent ratio of 0.62 is assumed for whole years.

Table 2-16 Forecast Acreage and Production of Rubber and Pepper in The Study Area

Crop	Area		1977	1985	1995	2005
Rubber	Miri	Acreage (ha)	6,500	6,500	6,500	6,500
		Production (tons)	2,000	2,343	2,856	3,482
	Baram	Acreage (ha)	6,850	6,850	6,850	6,850
		Production (tons)	2,500	2,929	3,571	4,353
	Limbang	Acreage (ha)	6,000	6,000	6,000	6,000
		Production (tons)	1,750	2,050	2,499	3,047
	Sub-total	Production (tons)	6,250	7,322	8,926	10,882
Pepper	Miri	Acreage (ha)	245	276	320	372
		Production (tons)	555	731	1,031	1,454
	Baram	Acreage (ha)	235	265	307	357
		Production (tons)	565	744	1,050	1,480
	Limbang	Acreage (ha)	138	155	180	209
		Production (tons)	85	435	613	865
	Sub-total	Production (tons)	1,205	1,910	2,694	3,799

(2) Case 2: "With" the Project Road

It is very complex to estimate the extent of agricultural development from the construction of the Project Road due to the particular conditions of the Study Area described as follows:

a) Complicated land tenure customs and traditions vary from race to race;

b) The traditional way of life and system of production relying on rivers;

c) There is psychological resistance to the introduction of new (and unfamiliar) technology and mastering new techniques;

d) There is a lack of capital and labour force required for agricultural development; and so on.

All regional development projects in Sarawak are destined to be subjected to the influence of socio-economic factors; however, these are more distinct in the Study Area due to its backwardness and also the fact that infrastructure is very inadequate.

On the other hand, however, it is quite certain that such traditional beliefs are gradually being changed by virtue of increased education and improved communication. Also the Government is exerting its effort to modernize agriculture through various subsidy schemes and technical training programs, etc.

Accordingly, although the realization of the Project Road does not necessarily guarantee that the agricultural development in the development potential blocks will progress automatically, it is quite certain that the Government's leadership will make it easier for regional development to take place, with agriculture being at the core. Since it is expected that the population growth will continue at 2 to 2.5% per year throughout the 1980s and since controls in the cutting of forest resources for the purpose of "shifting cultivation" will become more and more strict, the expansion of arable land as well as an increase in yields will become vital factors to support the population. If the proper development policies/strategies are planned, it can be expected that the agricultural development along the Project Road will be encouraged

and progress rapidly.

Although the Baram area at present produces a surplus of rice. It will be insufficient in the near future if the regulations on shifting cultivation are tightened and productivity is not improved. In other words, if rice productivity remains at the level of one ton per hectare, but the population in the area increases at an average annual rate of 2.5%, arable land should be expanded by about 1,300 hectares by 1985, and by a further 1,700 hectares each by 1995 and by 2005. Consequently, the areas along the Project Road will experience strong pressure to be developed as land suitable for shifting cultivation which will be facilitated by the road access.

It is essential, both for the prevention of loss of forest resources by shifting cultivation and for the establishment of an economic base for inland inhabitants for whom self-sufficiency in rice would otherwise be difficult, that agricultural modernization and the programmed development of land suitable for agricultural development will be accomplished concurrently along with the construction of the Project Road. Assuming the size of agricultural development areas along the Project Road as 22,000 hectares in Limbang Valley and 10,000 hectares in the Long Lama, Tutoh/Apoh area, it is expected that production increases will be as shown in Table 2-17.

Table 2-17 Assumed Production due to The Agricultural Development of the Potential Areas

Area	Potential Block	Area (ha)	Crop	Assumed Yield (ton/ha)	1990	1995	2005
Long Lama	8,9						
		3,000	H. Paddy	1.2	1,800	3,600	3,600
		1,500	Rubber	0.54	405	810	810
		500	Pepper	3.65	913	1,825	1,825
	Sub-total	5,000			3,118	6,235	6,235
Apoh/Tutoh	10,14,12 13,15,16,17						
		3,000	H. Paddy	1.2	1,800	3,600	3,600
		1,500	Rubber	0.54	405	810	810
		500	Pepper	3.65	913	1,825	1,825
	Sub-total	5,000			3,118	6,235	6,235
Limbang Valley	30	22,000	W. Paddy	3.0	22,000	66,000	66,000