

**URBAN TRANSPORT
MASTER PLAN STUDY
FOR THE
JOHOR BAHRU CONURBATION
MALAYSIA**



**TECHNICAL REPORT 5
SOCIO-ECONOMIC STUDY**

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**GOVERNMENT OF
MALAYSIA**



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1.0 INTRODUCTION

1.1 Background and Significance of Study

It can be reckoned that prevailing economic activities and future economic prospects forms a very important part of the entire study. Undeniably, the economic growth or upheavals in the economy of the region could be studied alongside levels of outputs and productivity, employment growth and income production, gross domestic and regional products etcetra. All these, in turn, constitute the essential inputs, not only for social and physical planning but also the basis for traffic planning and transportation studies. It is within this contention that the existing economic struture, in the Study Area is analysed and the likely future trends of the economy highlighted.

1.2 Scope of Study

Current economic development and prospects in the Study Area were reviewed within the overall framework of national, state and regional contexts. In particular, it was deemed to be of paramount importance to include, not only the perspectives from the impacts of both past and current economic trends and developments but also of future development strategies and policies vis-a-vis the five year Fourth Malaysia Plan 1981 - 85 (FMP) and the New Economic Policy (NEP).

2.0 ECONOMIC REVIEW OF MALAYSIA'S DEVELOPMENT PLAN

2.1 Development Under The New Economic Policy 1971 - 80

In line with the objectives of the NEP, the Government has embarked upon policies and programmes aimed primarily at eradicating poverty and restructuring of society. It was during the period 1971 - 80 that the Gross Domestic Product (GDP) grew to 7.8% per annum, thereby, reflecting favourable

economic growth. In the aspect of poverty eradication, the growth of the economy and favourable world prices for the nation's major export commodities have led to a decline in the incidence of poverty from 49.3% in 1970 to 29.2% in 1980¹. In terms of income distribution, the imbalances in the ownership of assets by ethnicity which prevailed in 1970, were to some extent, reduced. Although Malay mean income continued to be below the national average, their mean income grew at the highest rate as compared to other ethnic groups during 1971 - 79 thereby, reducing the gap between the Malay mean income and the national average from 34.8% in 1970 to 32.7% in 1979. Significant structural changes in the composition of output also occurred within the sectors, particularly in agriculture, mining and manufacturing. In terms of exports, the total exports of goods and non-factor services in real terms increased by 7.6% per annum. The performance of imports during the decade which was influenced by domestic demand for consumption, intermediate and investment goods, increased in real terms at a rate of 9.8% per annum.

Employment for the whole nation increase at an average annual rate of 4.1% between 1970 and 1980. In Peninsular Malaysia, the unemployment of the Malay decreased from 8.1% in 1970 to 5.1% in 1980; that of the Chinese from 7% to 5.3% and the Indians from 11% to 7.5%.

1. Fourth Malaysia Plan, PP4.

Table 2.1 : Summary of GDP and per capita GDP Growth by State, 1971 - 80

State	Gross Domestic Product		Average annual growth rate	Per capita GDP		Average annual growth rate
	1971	1980		1971	1980	
<u>High-Income</u>			1972 - 80			
Federal Territory						
Selangor	3,826	8,126	8.7	2,159.9	3,176	4.4
<u>Middle-Income</u>						
Johor	1,476	2,941	8.0	1,083.7	1,726	5.3
Melaka	373	708	7.4	877.0	1,469	5.9
Negri Sembilan	583	1,090	7.2	1,144.5	1,817	5.3
Pahang	647	1,218	7.3	1,169.8	1,486	2.7
Perak	1,927	2,967	4.9	1,166.7	1,583	3.5
Pulau Pinang	850	2,286	11.6	1,035.2	2,357	9.6
Sabah	905	1,816	7.9	915.2	1,382	4.7
<u>Low-Income</u>						
Kedah/Perlis	828	1,463	6.5	728.3	1,101	4.7
Kelantan	413	786	7.4	564.1	842	4.6
Trengganu	268	759	12.3	614.8	1,316	8.8
Malaysia	13,016	26,188	8.1	1,172.2	1,836	5.1

Source : Fourth Malaysia Plan

In terms of regional economic growth, at the beginning of 1970, Selangor (inclusive of Federal Territory) was the richest state with a per capita GDP² of 2,153 almost double the national average of 1,172 and an overall high rate of economic activity. Kelantan, Kedah, Perlis and Trengganu were low income states at the beginning of 1970. Johor and other states such as Malacca, Negri Sembilan, Pahang, Perak and Penang, the so-called middle-income states, have relatively high per capita income. By the end of 1980, income levels of the poor states were increased. (See Table 2.1).

2.2 Outline Perspective Plan - Targets and Prospects 1981 - 90

Notwithstanding the fact that considerable progress has been achieved in employment generation and poverty eradication, there has, however, existed shortfalls in the attainment of the restructuring target. The Outline Perspective Plan (1971 - 90) which embodied the goals of the NEP in the long term basis, will provide a framework for working towards targets during the decade 1981 - 90.

The average annual GDP growth rate during the period 1981 - 90 is projected at 8.0% (an increase of 0.2% from that of average annual rate of 0.78% for 1970 - 80). Export of goods and services are projected to increase at a higher rate of 9.1% per annum in real terms compared with 7.6% per annum achieved during the 1971 - 80 period. Although the economy will continue to depend on imports, import growth during the eighties is projected at 8.7% per annum in real terms, well below the 9.8% per annum as recorded in 1970 - 80.

2. In \$ million in 1970 prices.

The agricultural sector will continue to be developed despite its decline in importance in terms of contribution to GDP (its average annual growth rate is projected to drop from 4.3% in 1971 - 80 to 3.5% in 1981 - 90). The manufacturing sector is projected to grow at a rapid rate of 10.9% per annum, services sector at 8.5% per annum and utilities sector at 9.7% per annum. Expansion of the government services sector at 9% per annum will be largely due to continued provision of economic and social services to meet the NEP objectives.

Growth and structural changes projected for the period 1981 - 90 will give rise to a situation whereby 1990 full employment of the labour force can be attained. Employment is estimated to grow by 3.2% per annum during 1981 - 90, a rate higher than the labour force growth of 3% per annum, leading to an unemployment rate of 3.2%. Labour productivity will increase significantly during the period. About 1.9 million jobs will be created during 1981 - 90 of which 91.8% will be in the non-agricultural sectors.

In the Johor State the agricultural and manufacturing sectors will continue to be the important sectors in the economy, accounting for 18.7% and 31.7% respectively of the state's Gross Regional Product in 1990. The agricultural sector is expected to be expanded with the implementation of the Johor Barat Integrated Agricultural Development (IAD) project and the resource development programmes in the Johor Tenggara area. As for the manufacturing sector, substantial increases in the manufacturing output is anticipated from the already established industrial estates at Tampoi and Larkin, as well as from the newly established industrial estates at Pasir Gudang. The port at Pasir Gudang, together with the related establishment of a wide range of ancilliary activities will contribute to the expansion of the tertiary sectors in the Johor state.

2.3 Fourth Malaysia
Plan 1981 - 85

Under the FMP, GDP is projected to increase at 7.6% per annum in real terms. The agricultural sector will expand at 3% per annum (as compared to 4.3% in the last decade) whilst the manufacturing sector will experience the fastest rate of growth of an estimated 11% per annum. This sector will account for about 1/3 of the increase in GDP and its share in total. GDP will increase from 20.5% in 1980 to 23.9% in 1985.

In terms of employment generation, it is anticipated that about 860,600 new jobs will be created during the period 1981 - 85, increasing total employment from about 5,093,500 to about 5,954,100. The unemployment rate will be reduced from 5.3% in 1980 to 4.9% in 1985. In absolute terms, however, about 19,000 additional persons will be unemployed, increasing the total unemployed to about 305,500 by 1985. (See Table 2.2).

The agricultural sector is expected to provide 8.3% of the new jobs and its share in total employment will decline from 40.6% in 1980 to 35.9% by 1985.

In terms of public development allocation, the Johor State received an allocation of \$2,929.18 million, the third largest public funds to be allocated after Selangor, Sabah and Pahang states.

Table 2.2 : Employment Growth by Sector, Malaysia, 1980 -85

Sector	1980		1985		Increase 1981 - 85 ('000)	Share in job creation 1981 - 85 (%)	Average annual growth rate of employment 1981 - 85 (%)
	Estimated employment ('000)	Share of total (%)	Estimated employment ('000)	Share of total (%)			
Agriculture, forestry and fishing	2,066.9	40.6	2,138.4	35.9	71.5	8.3	0.7
Mining and quarrying	89.6	1.7	91.9	1.5	2.3	0.3	0.5
Manufacturing	803.1	15.8	1,070.1	18.0	267.0	31.0	5.9
Construction	262.8	5.2	325.9	5.5	63.1	7.3	4.4
Electricity, gas and water	49.5	1.0	61.3	1.0	11.8	1.4	4.4
Transport, storage and communications	193.2	3.8	223.6	3.8	30.4	3.5	3.0
Wholesale and retail trade, hotel and restaurants	648.5	12.7	816.9	13.7	168.4	19.6	4.7
Finance, insurance, real estate and business services	52.1	1.0	64.5	1.1	12.4	1.4	4.4
Government services	710.1	13.9	890.0	14.9	179.9	20.9	4.6
Other services	217.7	4.3	271.5	4.6	53.8	6.3	4.5
Total	5,093.5	100.0	5,954.1	100.0	860.6	100.0	3.2
Labour force	5,380.0		6,259.6				
Unemployment	286.5		305.5				
Unemployment rate (%)	5.3		4.9				

Source : Fourth Malaysia Plan

3.0 THE NATIONAL AND REGIONAL ECONOMY

3.1. Gross Domestic Product (GDP)

As mentioned earlier, during the period 1971 - 80, Malaysia have undergone not only rapid economic growth, but also of structural transformation of its economy. The average annual growth rate during the decade of the seventies stood at 7.8% per annum.

The average annual growth rate of the period 1972 - 1980 was approximately 8.1% and 8.6% within the last 6 years. (See Table 3.1). Within the last 4 years, the average annual growth of the GDP recorded was 8.1%.

Table 3.1 : Gross Domestic Product, Malaysia 1970-1980
(\$ Million in 1970 Prices)

Year	Gross Domestic Product (GDP)	Average Annual Growth Rate (%)
1970	12,308	*
1971	13,016	5.7
1972	14,238	9.4
1973	15,904	11.7
1974	17,227	8.3
1975	17,365	0.8
1976	19,288	11.1
1977	20,753	7.6
1978	22,284	7.4
1979	24,346	9.3
1980	26,188	7.6

} 8.6%
 } 8.1%

Sources : (1) Economic Planning Unit (EPU).
(2) Fourth Malaysia Plan.

In terms of GDP by industry of origin, the proportion increase in GDP in the manufacturing sector during the period 1971 - 80 is relatively high as compared to other sectors. (See Table 3.2). This is preceded by the construction sector and the services sector. The estimated per capita GDP in 1971 in Malaysia which was approximately 1,172.2 million dollars had increased to \$1,836 million by 1980.

Table 3.2 : Gross Domestic Product by Industry of Origin, Malaysia, 1971 and 1980
(\$ Million in 1970 Prices)

Sector	1971	1980	% increase in GDP 1971 - 1980
Agriculture, Forestry and Fishing	3,852	5,809	50.8
Mining and Quarrying	834	1,214	45.5
Manufacturing	1,858	5,374	189.0
Construction	541	1,186	119.0
Services ¹	5,533	11,793	113.0
Total	12,618	25,376	
GDP	13,016	26,188	
Population ('000)	11,104.4	14,261.2	
Per Capita GDP (\$)	1,172.2	1,836.0	

Source : Fourth Malaysia Plan, pp. 100 and 101.

Note : 1. Services include utilities, transport, storage and communications, wholesale and retail trade, hotels and restaurants, finance, insurance, real estate and business services, government and other services.

Consideration of past trends and likely changes of the world economy has prompted the Team to project the Gross Domestic Product based on 3 scenarios viz:-

- High Estimates : The GDP is anticipated to grow at an average annual growth rate of 8.5 per cent between 1985 and 1990 and subsequently, declining to 8.0 per cent between 1990 and the year 2000. (Based on EPU's projections).
- Medium Estimates : Between 1985 and 1990, the average annual growth rate is expected to be at 8.5 per cent and 7.9 per cent between 1990 and the year 2000. (Based on the growth rate of EMP).
- Low Estimates : The GDP is assumed to grow at a constant average annual growth rate of 7.6 per cent between 1985 and 1990 and between 1990 and the year 2000. (Based on the average annual growth rate between 1980 and 1985).

Based on these scenarios, the GDP for various period are forecasted such as for 1985, it was approximately \$37,824 million and \$39,400 million, depending on the kind of estimates. (See Table 3.3 and Fig. 3.1).

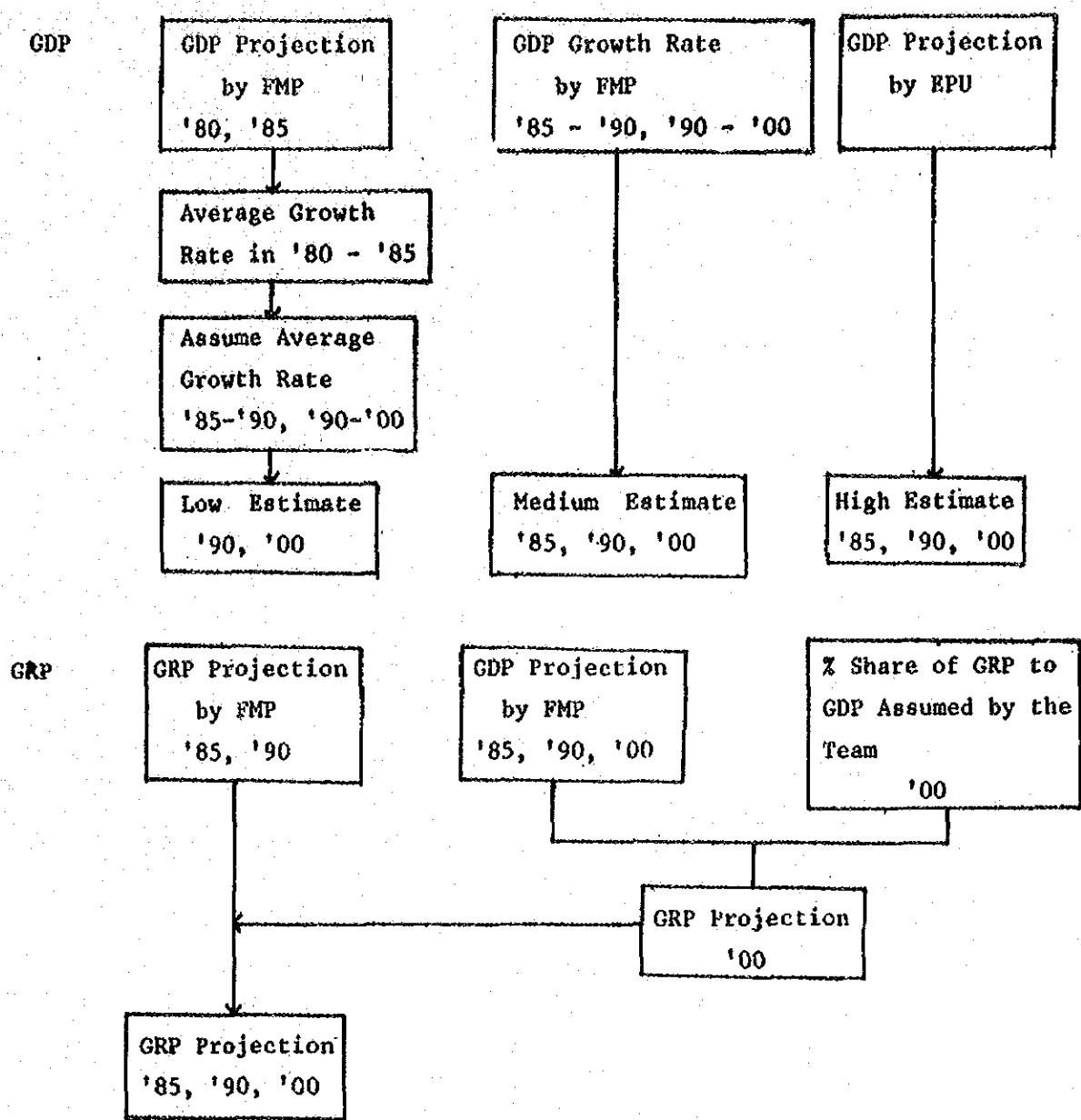


Fig. 3.1 : Methodology Flowchart for Projecting GDP and GRP 1980 - 2000

Table 3.3 : Projection of Gross Domestic Product, Malaysia 1980 - 2000
(\$ Million in 1970 prices)

Year	Estimates	Gross Domestic Product	Average Annual Growth (%)
1980 (Base Year)		26,188 ¹	*
1985	High	37,824 ¹	7.6
		39,400 ³	8.5
1990	Medium	56,760 ¹	8.5
	Low	54,500 ²	7.6
	High	59,200 ³	8.5
2000	Medium	121,400 ⁴	7.9
	Low	113,400 ²	7.6
	High	127,800 ³	8.0

- Sources : (1) Fourth Malaysia Plan (FMP).
 (2) Projected by the Team assuming constant growth rate of FMP 1980 - 85.
 (3) Projected by Economic Planning Unit (EPU).
 (4) Projected by the Team basing on trend growth of FMP estimates.

3.2 Gross Regional Product (GRP) In the Johor State

For the Johor State, the economy has also experienced fast growth rate over the past 10 years. The average annual growth of its GRP was 9.4 per cent between 1971 and 1980 and 8.1 per cent between 1972 to 1980³. The average annual growth rate was 7.4 per cent within the last 5 years.

In terms of the share of GRP to GDP, an increasing trend is observed from 1970 to 1975 but thereafter, its share to total GDP decreases from 11.8 per cent in 1975 to 11.2 per cent in 1980 (See Table 3.4).

3. Such high average annual growth rate in GRP is comparable to the State of Penang which achieved 9.6 per cent in the last 9 years and 6.9 per cent in the last 3 years.

Gross Regional Product, Johor State
(\$ Million in 1970 prices)

	Johor State		Malaysia		Share of GRP to GDP %
	GRP	Average Annual Growth %	GDP	Average Annual Growth %	
1970	1,194	*	12,308	*	9.7
1971	1,476	23.6	12,016	5.7	11.3
1975	2,055	6.8	17,365	7.5	11.8
1978	2,587	8.0	22,284	8.7	11.6
1980	2,941	6.6	26,188	8.4	11.2

Sources : (1) Third Malaysia Plan.
(2) Mid-Term Review of TMP.
(3) Fourth Malaysia Plan.

Nevertheless, the share of GRP to GDP has increased substantially from 9.7 per cent in 1970 to 11.2 per cent in 1980.

Based on the likely changes in the economy of the State and the country as a whole, the Team anticipated that there will be a further increase of the GRP from 11.2 per cent in 1980 to 11.3 per cent in 1985 and 11.6 per cent in the year 2000. (See Table 3.5). By this way, the GRP is projected basing on the share of GRP to GDP proportions. The GRP by industry of origin is depicted as in Table 3.6.

Table 3.5 : Projected Gross Regional Product, Johor State, 1980 - 2000
 (\$ Million in 1970 prices)

Year	Estimates	Gross Regional Product	Gross Domestic Product	Share of GRP to GDP %
1980 (Base Year)		2,941	26,188	11.2
1985	High	4,274	37,824 ¹	11.3 ³
		4,452 (4,286) ¹	39,400	
1990	Medium	6,471	56,760 ¹	11.4 ³
	Low	6,213	54,500	
	High	6,749 (6,460) ¹	59,200	
2000	Medium	14,082	121,400 ²	11.6
	Low	13,154	113,400	
	High	14,825	127,800	

- Sources : (1) Projected estimates in the Fourth Malaysia Plan.
 (2) Projected base on trend growth of FMP estimates.
 (3) Based on FMP estimates for GDP and GRP for Malaysia and the State of Johor.

Table 3.6 : GROSS REGIONAL PRODUCT BY INDUSTRY OF ORIGIN, JOHOR STATE 1971-1990
 (\$ Million in 1970 prices)

SECTOR	1971	1980	1985	1990	2000 ²	AVERAGE ANNUAL GROWTH RATE %			
						1971-80	1980-85	1985-90	1990-2000
Agriculture, Fishing, etc.	625	938	1042	1207	1400	4.6	2.1	3.0	1.5
Mining & Quarrying	32	12	13	12	12	-10.3	1.6	-1.6	0
Manufacturing	217	679	1195	2045	4968	13.5	12.0	11.3	9.3
Construction	32	99	160	261	613	13.4	10.1	10.3	8.9
Services ¹	530	1129	1752	2720	6618	8.8	9.2	9.2	9.3
TOTAL (GRP)	1,436 (1,476)	2857 (2941)	4162 (4286)	6245 (6461)	13611 (14082)	7.9	7.8	8.5	8.1

Note: 1. Inclusive of utilities, transport, storage and communication and insurance, wholesale and retail trade, banking, public administration and defence, and real estate and other services.

2. Projected by the Team.

Source : Fourth Malaysia Plan.

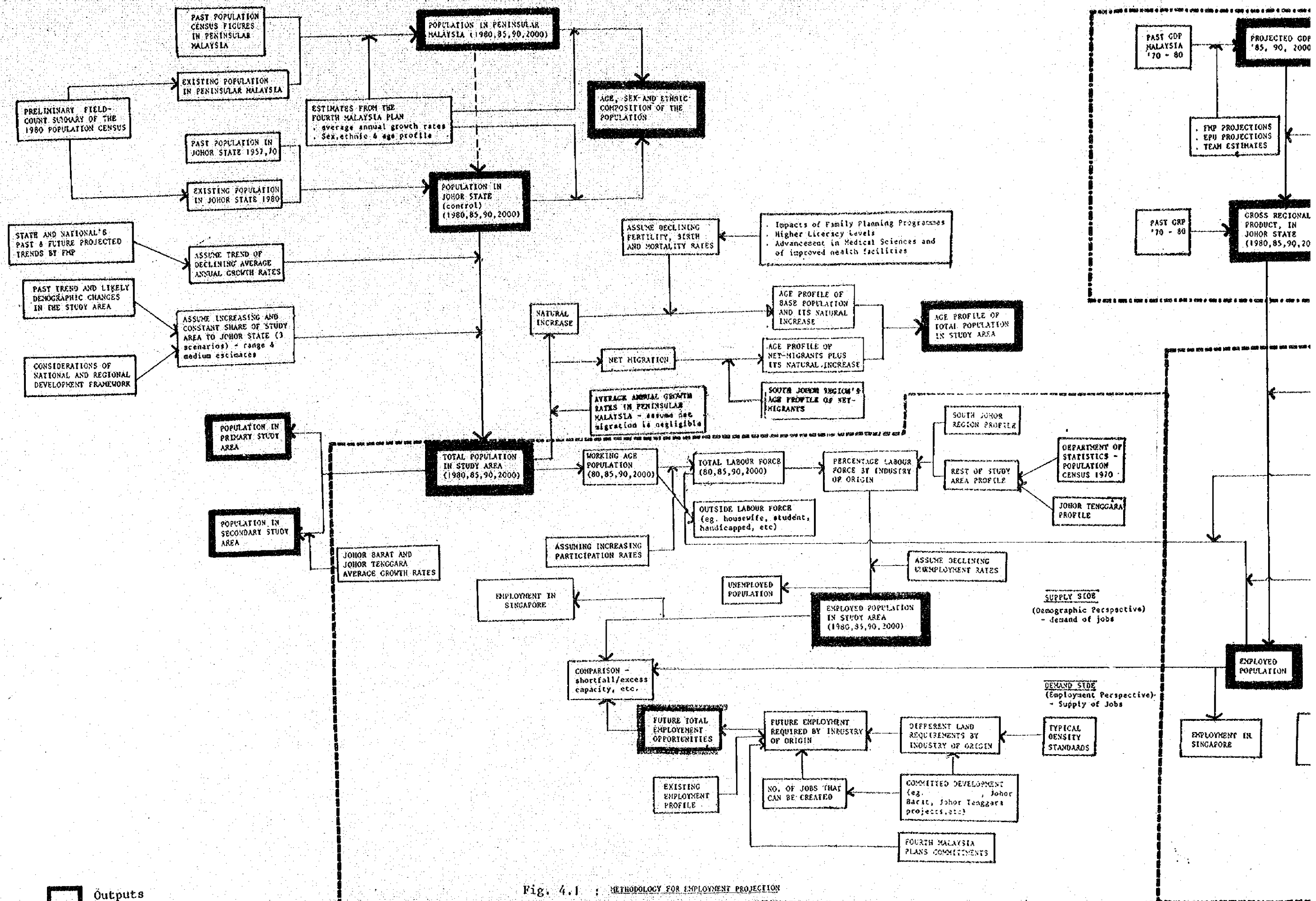


Fig. 4.1 : METHODOLOGY FOR EMPLOYMENT PROJECTION

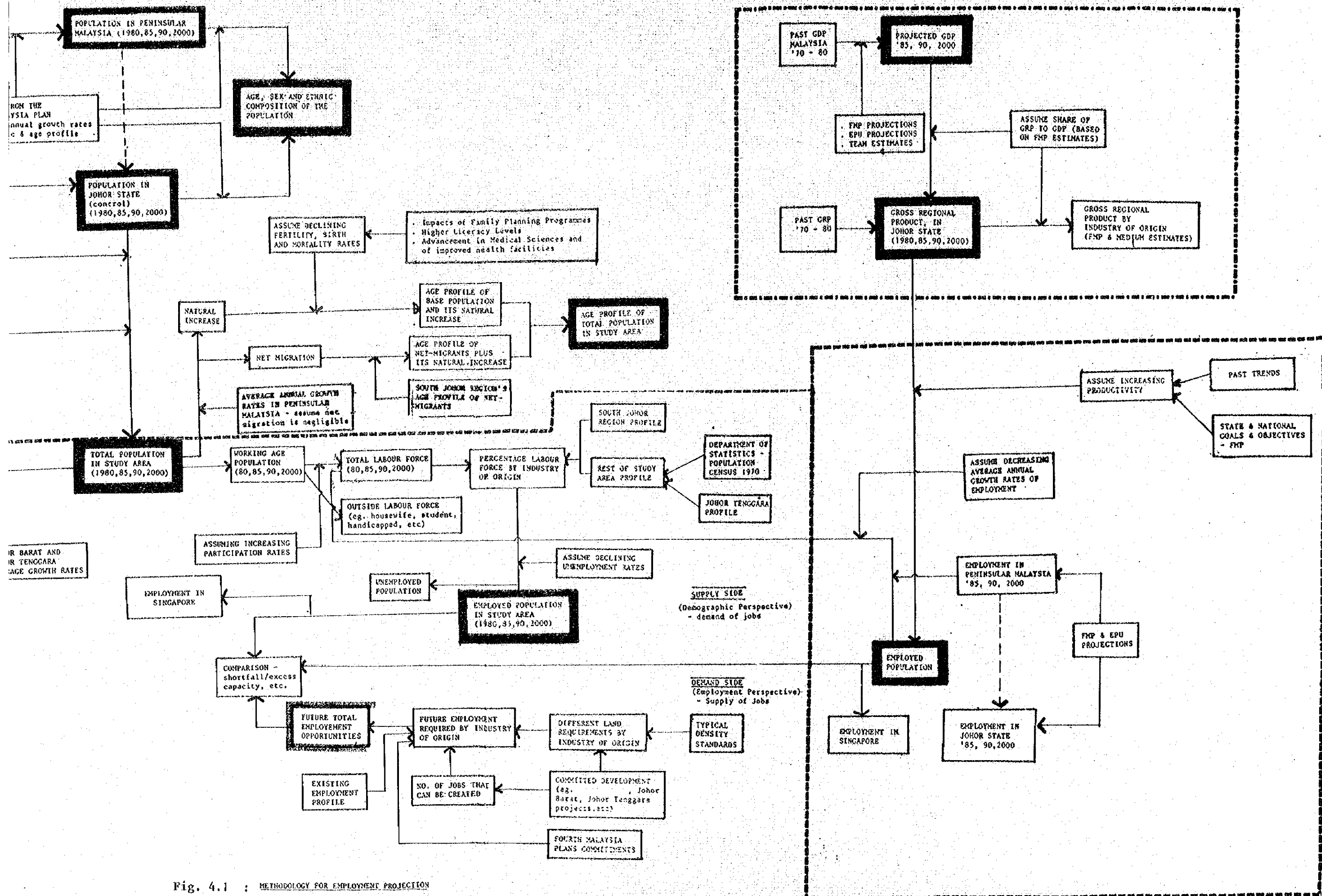


Fig. 4.1 : METHODOLOGY FOR EMPLOYMENT PROJECTION

Employment

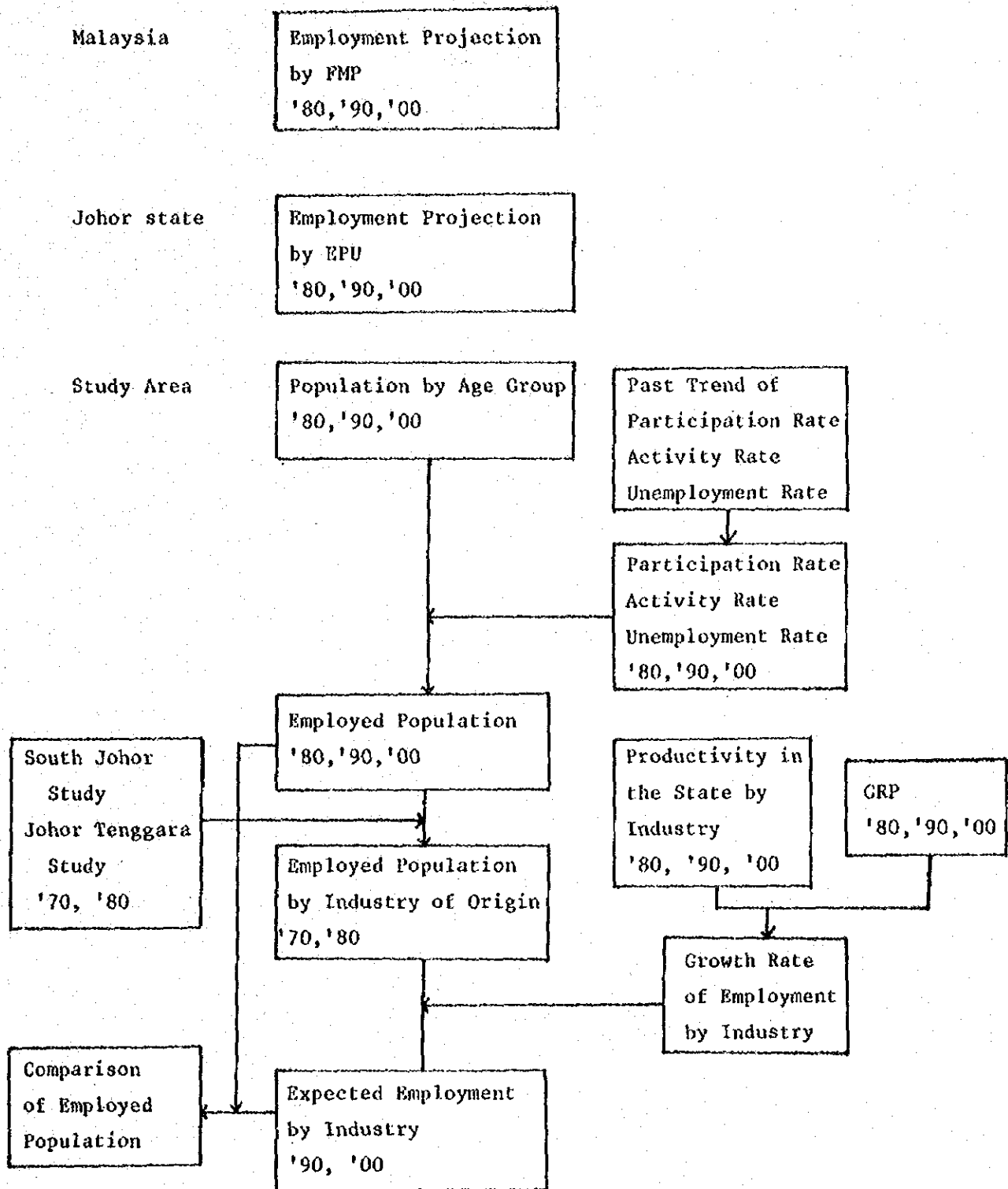


Fig 4.2 : General Framework of Employment Analysis

4.0 EMPLOYMENT GROWTH

4.1 Overall Framework of Employment Analysis

There are three levels of analysis viz. at the national, state and at the level of the Study Area (See Fig. 4.1 and 4.2). Employment forecasts in Malaysia were adopted based on Fourth Malaysia Plan estimates whilst at the State level, projections were based on that by the Economic Unit.

For the Study Area, the approach of employment study is to view the growth of workforce over the years, thereby ascertaining the future employment needs. There is also another approach, namely by increasing productivity assumption in terms of GRP per employed person. The future employment requirements were, compared with employment with employment creation or demand; the latter perspective is analysed from the optimum employment absorptive capacities of existing industry of origins as well as on committed developments

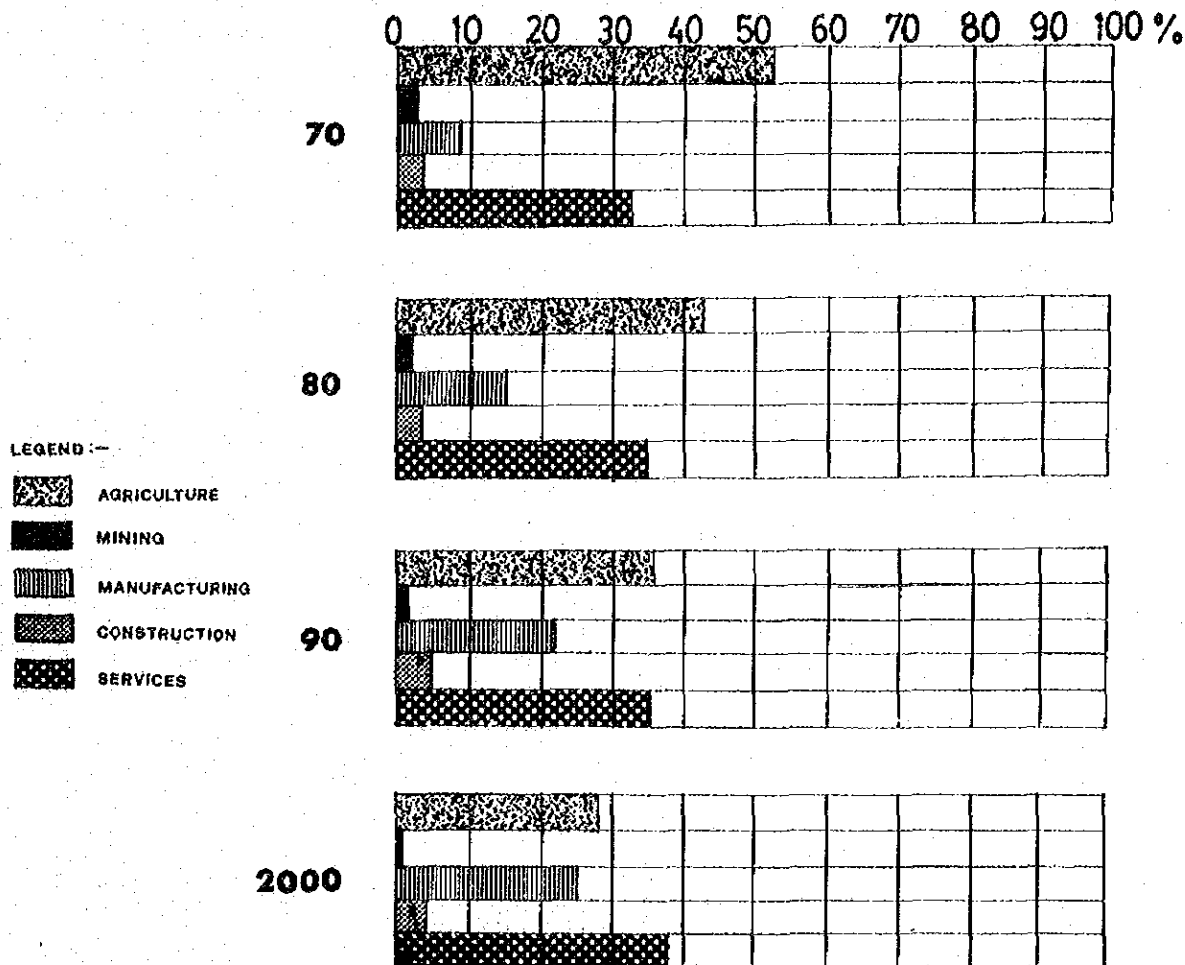
By such comparisons, any shortfall or surplus in employment can be determined. These figures are also checked with that forecasted by SPU.

Table 4.1 : EMPLOYMENT TARGETS BY INDUSTRY OF ORIGIN, MALAYSIA, 1970-2000

	1970 ('000)	1980 ('000)	1990- ('000)	2000 ('000)	AVERAGE GROWTH RATE %		
					1970 -80	1980 -90	1990- 2000
Agriculture & Fishing	1714.6	2066.9	2,223.9	2314.5	1.9	0.7	0.4
Mining	88.6	89.6	93.1	97.9	0.1	0.4	0.5
Manufacturing	386.5	803.1	1368.7	2105.2	7.0	5.2	4.2
Construction	136.7	262.8	413.6	556	6.3	4.5	3.0
Services	1065.5	1871.1	2902.4	3977.0	5.5	4.3	3.2
TOTAL	3395.9	5093.5	7001.7	9050.6	4.0	3.2	2.6

Source : FMP

Fig. 4.3 : EMPLOYMENT BY INDUSTRY OF ORIGIN AS PERCENTAGE OF TOTAL EMPLOYMENT, MALAYSIA, 1970-2000



Source: FMP

4.2 Employment in Malaysia

As projected by FMP, the average growth rate of the agriculture sector which had been on the decline in the last decade, is envisaged to continue such a trend (See Table 4.1). The mining subsector is relatively stable whilst the manufacturing sector, though also on the decline in terms of average annual growth rate, will increase from its employment absorption from 803,100 in 1980 to 2,105,200 in 2000. Another major increase in employment absorption lies in the services sector. The significance of each sector can also be seen in Fig. 4.3.

4.3 Employment in the Johor State

Employment targets by EPU for the State of Johor has similar characteristics to that of Malaysia in that agriculture is decreasing in significance whereas manufacturing and the tertiary sectors are gaining more and more importance (See Table 4.2)

Table 4.2: Employment Targets by industry of origin, Johor State, 1970-2000 ('000)

Sector	1970	1980	1990	2000	Average Growth Rate %		
					1970-80	1980-90	1990-2000
Agriculture/fishing, etc	218.9	257.0	280.0	290.0	1.6	0.9	0.4
Mining	2.3	3.0	3.0	3.0	2.9	0.0	0.0
Manufacturing	31.4	77.0	162.0	279.1	9.4	7.7	5.6
Construction	6.0	16.0	30.0	54.6	10.2	6.7	6.0
Services	105.0	160.0	223.5	294.6	4.3	3.4	2.8
Total	363.6	513.0	699.0	921.3	3.5	3.1	2.8
(Share to Malaysia %)	(10.7)	(10.1)	(10.0)	(10.2)			

Source: EPU

As a percentage share to total Malaysia, the employment share in the State of Johor has been on the decline since the last decade and is expected to continue slightly till 1990. By 2000, it is envisaged that Johor State will have an increased share from 10 percent in 1990 to 10.2 percent in 2000. Such an increase could be attributed to the fact that by 2000, most of the major development schemes and projects such as the Pasir Gudang Industrial Complex and Agriculture schemes by Kejora and Johor Barat will have been fully developed, thereby, capable of absorbing much more employed workforce than other States.

4.4 Growth of Labour Force and Employment Creation 4.4.1 Workforce Growth and Employment Needs

In 1970, the average participation and activity rates in Peninsular Malaysia are the highest relative to Johor State, the Study Area or MPJB (See Table 4.3). The unemployment rate in 1970 for Malaysia was 7.8 percent and for the Johor State, it was 5.34 percent⁴.

The forecasts on the growth of the labour force over the next two decades are based on the consideration of the following salient factors viz:-

1. The age composition of the labour force is expected to be higher in the future than at present because of improved health facilities, education and promotion of family planning programs which therefore, lowers the fertility and birth rates and mortality rates.
2. It is anticipated too that a substantial proportion of the population who are made up of migrants, tend to be centred around the economically active age-group. In view of all these, an increase in the percentage of the working age population (15 years and above) in the future is anticipated.
3. According to past trends, the participation rate on the average tend to increase over the years 1957-1970. Consideration of prospects of labour supply and demand and coupled with past trends, the participation ratio will increase.

4. Source: Department of Statistics

Table 4.3: Past Trend of Labour Force Growth 1970-80

	1970 ⁴				1980			
	Peninsular Malaysia	Johor State	Study Area	MPJB	Peninsular Malaysia	Johor State	Study Area	MPJB
Population	8,810,000	1,277,000	443,930	150,800	11,138,000	1,602,000	619,594	247,000
Working-age Population	4,607,630	635,950	230,365	88,220	6,404,000	878,000	*	146,538
Labour Force	3,098,000 (3,026,000) ⁵	380,390	144,440	45,650	4,512,100 ⁶ (4,403,300) ⁴	*	*	*
Participation Rate ²	67.2	59.8	61.4	51.8	70.5 (68.8)	*	*	*
Activity ³ Rate	35.2 (33.0)	29.8	32.5	30.2	40.5	*	*	*

Note: 1. Refers to the economically active age group ie those of 15 to 64 years age groups.

2. Labour Force Participation Rate = $\frac{\text{Total Labour Force}}{\text{Working Age Population}}$ %

3. Activity Rate = $\frac{\text{Total Labour Force}}{\text{Total Population}}$ %

4. Source: Department of Statistics, 'Population and Housing Census 1970'

5. South Johor Study, Vol 2

6. Source: EPU

Labour force growth rates in the Study Area are anticipated to be higher than the national's average of 3.1 percent per annum during the period 1980-85⁵. Activity rates are assumed to increase from 32.5 percent in 1970 to 35.2 percent in 1980, 37.7 - 38.7 percent in 1990 and 41.1 - 42.9 percent in 2000 (See Table 4.4). Projected labour force in the Study Area is anticipated to increase from 216,857 in 1980 to 298,146 in 1990 and 385,357 in the year 2000 (Medium estimates). However, the average annual growth of the labour force are expected to decrease slightly over the next two decades. Such a phenomenon associated with the relative decline in the economically active population, could be attributed in term to the following reasonings:-

1. There existed relatively longer mean length of life whilst the economically active life remained constant;
2. There is also the relatively longer educational period in relation to the economically active period;
3. There is an outflow of migrant workers to Singapore⁶, and
4. There existed hidden or disguised unemployment such as those engaged in the agricultural sector as well as employed persons who were classified as being outside the labour force but who are willing to work but did not register with the labour office.

5. Fourth Malaysia Plan, pp 223.

6. Based on Causeway Survey (1981), there are approximately 12,500 migrant workers to Singapore in 1980.

Table 4.4: PROJECTED LABOUR FORCE SUPPLY, AND EMPLOYMENT IN THE STUDY AREA 1980-2000.

	ESTIMATES	1980	1990	2000	AVERAGE ANNUAL GROWTH RATE%	
					1980-90	1990-2000
TOTAL POPULATION	MAXIMUM	619,590 ²	928,600	1,350,400 ³	3.3	2.6
	MINIMUM		774,800	917,200	2.3	1.7
WORKING AGE POPULATION (15 - 64)	MAXIMUM	350,915	552,632	871,827	3.8	3.5
	MINIMUM		468,713	597,902	2.9	2.5
LABOUR FORCE	MAXIMUM	218,269	359,210	579,764	4.2	3.7
	MINIMUM		327,053	406,969	3.0	2.6
PARTICIPATION RATE	MAXIMUM	62.2	65.0	66.5		
	MINIMUM		62.3	63.0		
ACTIVITY RATE		35.2	38.7	42.9		
			37.7	41.1		
UNEMPLOYMENT RATE%		7.0	6.0	5.0		
		5.0	4.0	3.0		
UNEMPLOYMENT		15,279	16,353	16,279		
		10,913	11,680	11,300		
EMPLOYMENT POPULATION		202,990	310,700	390,690	4.3	2.3
		-207,356	347,530	-568,464	5.3	5.0

Source: 1. Study Team Estimates, 1981.

2. Department of Statistics, 'Preliminary Fieldcount Summary of 1980 Population Census.

3. This refers to the maximum planning target population by year 2000.

Apart from basing on the likely trends of participation and activity rates in the Study Area being higher than the State, future employment in the Study Area will grow faster in view of the likely increase of economic activities and of major development projects in the region. Unemployment rate is expected to decrease substantially from 1970 to 2000.

In 1980, the employed population in the Study Area constituted as much as 39.6-40.4 percent of the State's share of total employment. In absolute terms, the employed population from demographic perspective, is envisaged to increase from 202,990 in 1980 to 310,700 in 1990 and reaching 390,690 in 2000 (low estimates) and from 207,356 in 1980 to 347,530 in 1990 and finally 568,464 in 2000 (high estimates).

4.4.2 Employment Growth and Increasing Productivity

Employment by industry of origin in the Study Area in 1970 and 1980 were estimated based on South Johor region and typical employment (See Table 4.5). The future employment by industry of origin in the Study Area which was obtained by Shift-Share Analysis, assumed increasing productivity and on FMP's future estimates of GRP by industry of origin for the Johor State.

Table 4.5: Employment in Study Area by Industry of Origin, 1970-1980

	1970			1980		
	SJR ¹	Partial Kota Tinggi in Study Area	Total	SJR ¹	Partial Kota Tinggi in Study Area ²	Total
Agriculture/fishing	58,528	6,307	64,835	55,520	12,752	68,272
Mining	276	76	352	300	-15,406	-70,926
Manufacturing	18,258	519	18,777	48,750	165	465
Construction	2,841	123	2,964	7,920	-200	-500
Services	43,541	2,416	45,957	68,940	2,050	50,800
Total	123,444	9,441	132,885	181,430	-2,420	-51,170
					541	8,461
					-645	-8,566
					6,052	74,992
					-7,254	-76,194
					21,560	202,990
					-25,926	-207,356

Sources: (1) South Johor Regional and Development Study, 1974.

(2) Refers to minimum and maximum estimates.

4.4.3 Employment Creation by Industry of Origin

Previously, the Study Area's employment structure was projected from 1990 and 2000 based on productivity assumptions derived from EPU's targets for GDP and GRP for Malaysia and the state of Johor (See Table 4.6). The projections represent employment targets from the one demand point of view and may not be reflective of the actual employment market capacity. It is thus necessary to examine employment creation from the view point of actual demand, that is, to assess the capacity of the economy in the absorption of labor within its various sectors.

Table 4.6 : Employment Targets by Sectors (1970 - 2000)

Sectors	Employment			
	1970	1980	1990	2000
Agricultural Fishing, etc.	65,328	69,599	92,435	103,595
Mining	352	483	483	483
Manufacturing	18,777	50,985	105,200	199,720
Construction	2,964	8,513	17,517	33,449
Services	45,957	75,593	113,978	160,271
Total	133,378	205,173	329,653	497,518

Source : Study Team Estimates (1981)

NB : Figures shown refer to medium estimates

(a) The Holding Capacity of the Agricultural Sector

Based on the productivity assumption method, the total number of persons engaged in the agricultural sector (inclusive of fishing and mining) was projected to be 69,599 in 1980 of which 86% or 60,270 comprised of cropping subsector workforce. The productivity assumption method however, fails to take into account the holding capacities of existing as well as future cropping activities in relation to land area and its availability, an ingredient crucial to a land-based

activity like cultivation. The methodology adopted to calculate the holding capacity of the agricultural sector, particularly that of the cropping subsector is illustrated in Fig. 4.3. Essentially the method applies various land-man ratios (defined as the number of hectares which could be cultivated by 1 man) to different types of crops under different management systems, eg. estate, private smallholding and government block schemes and smallholdings.

Table 4.7 : Land-man Ratios

Crop Type	Management Type	Land-man Ratio (Ha./person)
Rubber	Private estates and government block schemes	3.2
	Private and government smallholdings	2.4
Oil Palm	Private estates and government block schemes	4.5
	Private and government smallholdings	2.4
Other Crops	All management types	3.2

Source : Johor Tenggara Transportation Study (1980).

Applying the land-man ratios, it was estimated that the cropping subsector in 1980 was capable of sustaining 96,397 persons in contrast to the employment target of 60,273 in Table 4.6. This implies that the existing cultivated areas are underutilised and that an intensification of cropping use will further generate employment for over 35,000 people. (See Table 4.8).

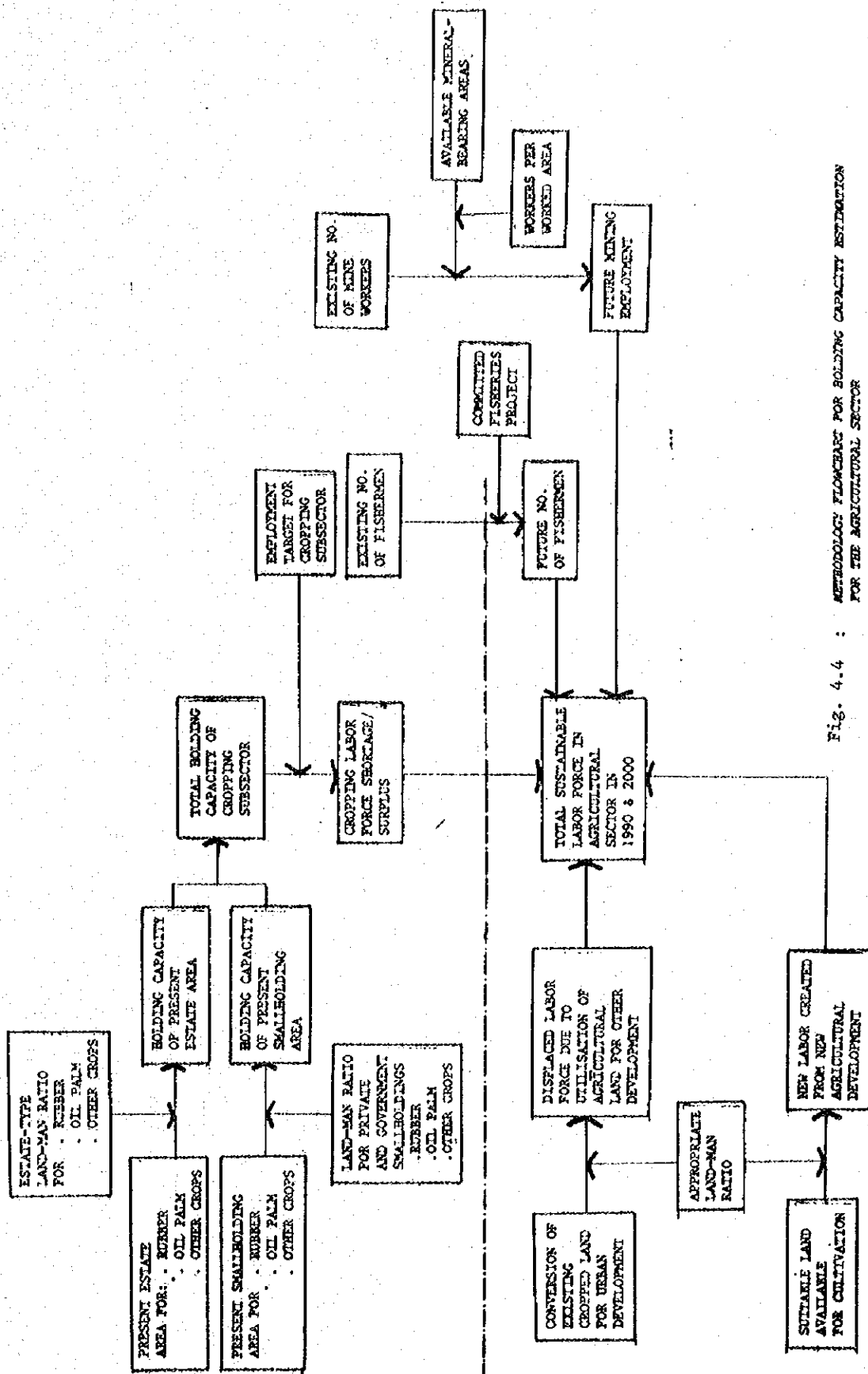


Fig. 4.4 : METHODOLOGY FLOWCHART FOR HOLDING CAPACITY ESTIMATION FOR THE AGRICULTURAL SECTOR

Table 4.8 : Holding Capacity of Cropping Subsector (1980)

District	Crop	Private smallholding		Government smallholding		Private and government estate		Total labor force
		Cropped area(Ha)	Labor	Cropped area(Ha)	Labor	Cropped area(Ha)	Labor	
Pontian	Rubber	28,659	11,941	-	-	1,017	318	12,259
	Oil Palm	2,434	1,014	-	-	833	185	1,199
	Other Crops	27,328	8,540	-	-	3,437	1,074	9,614
Johor Bahru	Rubber	23,949	9,979	4,819	2,008	40,289	12,589	24,576
	Oil Palm	1,056	440	8,077	3,365	31,192	6,931	10,736
	Other Crops	3,286	1,027	-	-	1,068	334	1,361
Kota Tinggi	Rubber	-	-	20,875	8,698	-	-	8,698
	Oil Palm	-	-	24,350	10,146	44,874	14,023	24,169
	Other Crops	11,785	3,683	-	-	-	-	3,683
	Total	98,497	36,624	59,121	24,217	122,708	35,454	106,369

Source : Study Team Estimate, (1981).

Besides estimating the labor-absorption capacity of existing cultivated area, it is also necessary to estimate potential labor-absorption due to new agricultural development schemes, as well as that displaced through the conversion of agricultural land for urban use. The Land Use Study established that there is only approximately 14,000 ha. of Class 1 and Class 2 Soils (soils suitable for cultivation of crops) in the Study Area that have yet to be developed. It is unlikely then that any major agricultural development will take place in the future.

As regards the conversion of agricultural land for urban development, it is estimated that approximately 4,950 ha. of existing agricultural area will be converted for housing, institutional, infrastructural and industrial development by 1990. By 2000, another 5,340 ha. is expected to be reduced from total cultivated areas. (For details of urban developments affecting agricultural land, refer to Land Use Study, Appendix 4.2).

In terms of employment opportunities, 37,822 agricultural jobs will be available between 1980 - 90, of which 92% is accrued to the shortfall in 1980 and the remaining 8% created through the opening of new land for agriculture (See Table 4.9). Thus, it is estimated that a total of 98,578 persons will be employed in the Cropping Sector in 1990 and 96,908 in 2000.

Table 4.9 : Holding Capacity of Cropping Subsector (1980 - 2000)

	1980	1990	2000
Existing employment	60,756	-	-
Actual holding capacity	96,397	-	-
Sustainable labor from 1980	-	35,641	-
Employment created from new agricultural development	-	3,111	-
Displaced labor from conversion of existing cropped area to other uses	-	-930	-
Net employment opportunities	-	37,822	-
Total employment		98,578	
Displaced labor from conversion of existing cropped area to other uses	-	-	-1,670
Total employment	-	-	96,908

Source : Study Team Estimates (1981)

On the whole, total employment in the agricultural sector is estimated to increase from 70,082 in 1980 to 110,618 in 1990 and 111,548 in 2000 (See Table 4.10). Cropping subsector employment is consistently dominant, employing over 90% of the agricultural labor force. It can be seen, that maximum capacity of this sector will be attained in the 1990's.

Employment in the fishing subsector is expected to increase by 3.0% and 2.0% in 1990 and 2000 respectively. The increase is anticipated in view

of the the construction of the 2-phased fishing complex by the Fisheries Department at Kuala Sedeli during the Third Malaysia Plan, such as a jetty, selling centre, parking bays as well as a trawlers project. Concurrent to this, MAJUIKAN had also set up a marketing complex at Kuala Sedeli.

It is estimated that by 1990, with the exception of the mines at the Tanjung Penggerang area, the mines in Johor Bahru District will be depleted. Hence, after 1990, mining employment will be sustained at 160 workers only by the bauxite mines at Teluk Ramunia, where upon, no further increases are anticipated.

Table 4.10 : Estimated Employment in the Agricultural Sector (1980 - 2000)

	Employment			Growth Rate (%)	
	1980	1990	2000	1980 - 90	1990 - 2000
Cropping subsector	60,756	98,578	96,908	4.9	-1.7
Fishing	8,843	11,880	14,480	3.0	2.0
Minings and others	483	160	160	-10.4	0
Total	70,082	110,618	111,548	4.7	0.1

Source : Study Team Estimates (1981).

(b) Employment Demand in the Industrial Sector

Industrial employment here is defined as follows:

- . Employment in manufacturing industries
- . Employment in agricultural-processing industries

The methodology applied in estimating the demand for manufacturing employment is shown in Fig. 4.4 :

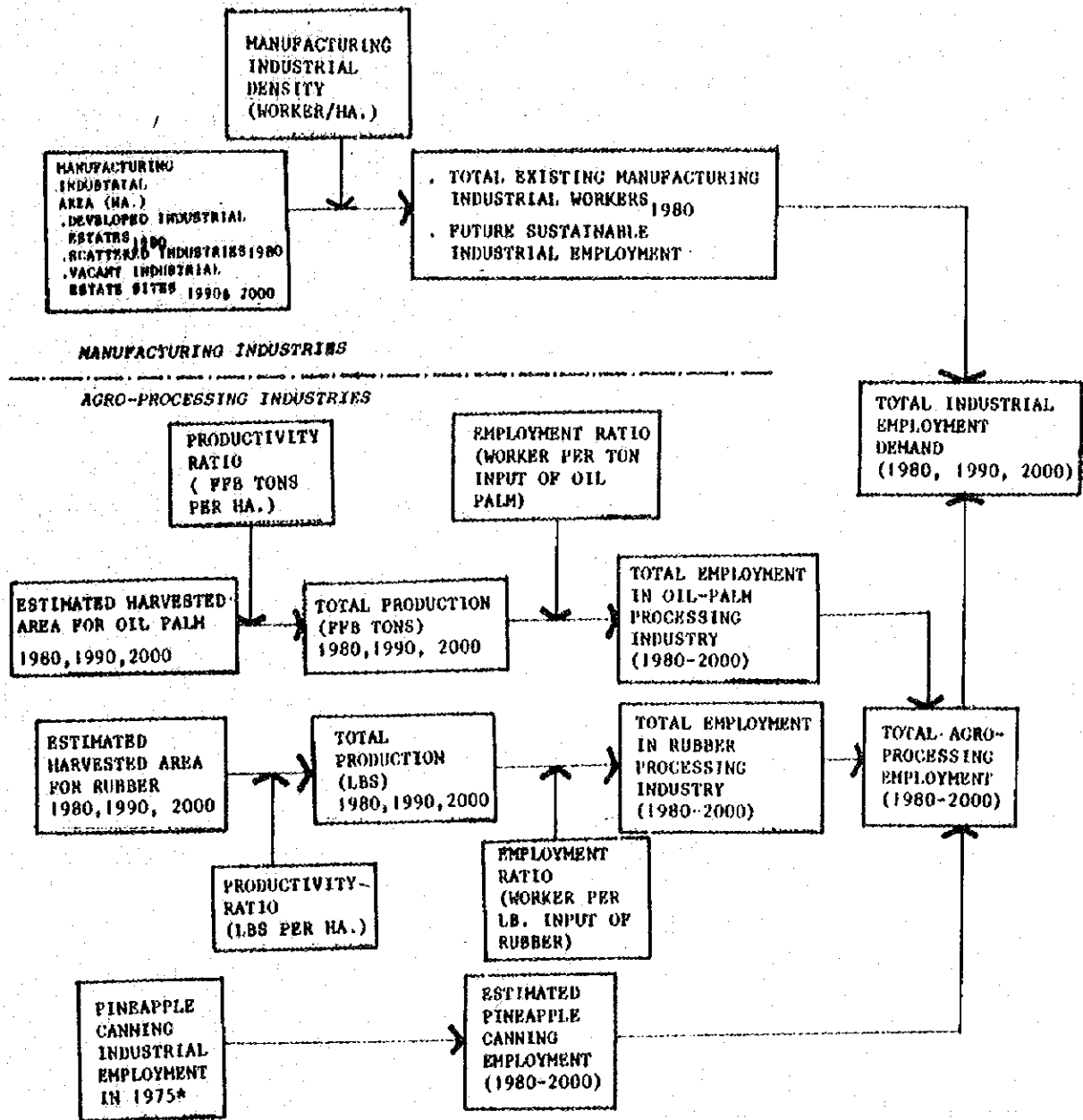


Fig. 4.5 : METHODOLOGY FLOWCHART FOR ESTIMATING DEMAND FOR INDUSTRIAL EMPLOYMENT

Source: Socio-economic Survey of Pineapple Smallholders (1975)

(i) Manufacturing Industrial Employment

In 1980, there were a total of 9 industrial estates in the State of Johor covering a surface of over 2,000 ha. Of these, 4 were located within the Study Area; in terms of land area, they comprised 84% or 570 ha. of total industrial area (See Table 4.11).

The industrial land area shown in Table 4.12 represent the developed portions of the industrial sites. It is estimated there are still 585 ha. of issued industrial land yet to be developed in the future. These areas are located mainly at the Pasir Gudang Complex and to a lesser extent, at Senai and Bandar Penawar. The sites at Tampoi and Larkin are already fully utilised, while new increased in dispersed industries⁷ area is not expected to be significant in view of current government policy of channelling all new applications for manufacturing industrial development into industrial estates wherein the appropriate infrastructural facilities worker-land ratio⁸, it was possible to estimate existing manufacturing employment

- . Free Trade Zone = 125 persons per ha.
- . General Industrial Area = 75 persons per ha.

The total number of manufacturing workers employed in the Study Area in 1980 was established at 53,196, of which 83% are working in the industrial estates and 17%.

Within the dispersed industrial areas especially along Jalan Abdullah Tahir, Jalan Tampoi and Jalan Skudai in Johor Bahru and in various other localities in the Districts of Pontian and Kota Tinggi.

7. Dispersed industries is defined here as those industrial enterprises not located within industrial estates.

8. South Johor Regional Study (1974).

Table 4.11 : Manufacturing Areas and Employment (1980)

Industrial Estates/Areas	Developed Area (Ha.)	Estimated Employment
Tampoi and Larkin	159*	11,925
Pasir Gudang	376*	28,200
Senai	24*	3,000
Bandar Penawar	11*	825
Industries in MPJB and Johor Bahru District	72	7,400
Industries in Pontian District	n.a.	1,092
Industries in Kota Tinggi District	n.a.	754
Total area of Industrial Estates	570*	53,196

Sources : (1) Economic Survey of Johor (1978).
 (2) Johor Barat Physical Planning Study (1980).
 (3) Study Team Estimates (1981).

The yet undeveloped land area at Pasir Gudang Complex, Senai and Bandar Penawar is estimated to have a holding capacity of 46,275 manufacturing workers over an area of 583 ha. (See Table 4.12). In addition to the employment generated by the formation of new industries in these areas, employment in existing industrial estates at Larkin and Tampoi are also expected to grow at 2.0% and 1.0% over the next 2 decades by reason of expansion of the firm's operations and activities. Dispersed industries will also generate new employment at a slightly greater rate of 3.0% in 1980 - 90 and 2.0% in 1990 - 2000⁹ due to both expansion of existing establishments and to the creation of new establishments.

9. Based on Johor Barat Physical Planning Study Estimates (1980).

Altogether, 86% of the new manufacturing jobs created in 1990 - 2000 will be industrial estates; the remaining 14% will arise from expansion of existing industries in industrial estates and dispersed areas.

Table 4.12 : Manufacturing Industrial Employment (1980 - 2000)

Industrial Estate	Employment creation	
	1980 - 90	1990 - 2000
Pasir Gudang - General Industry	39,150	-
Pasir Gudang - Free Trade Zone	4,000	-
Senai	2,000	-
Bandar Penawar	1,125	-
Employment from new industries in industrial estates	46,275	53,040
Employment due to expansion of existing industrial estates	2,605	9,570
Employment due to expansion of dispersed industries	1,804	2,720
Total new employment	50,684	65,330

Source : Study Team Estimates (1981).

Thus, there will be a manufacturing workforce of 103,880 and 169,210 in 1990 and 2000 respectively.

(ii) Agro-Processing Industrial Employment

In view of the fact that agricultural activities (especially rubber and oil palm cultivation) play such crucial roles in the region's economy, it is of significance to take into account the industrial employment generated by rubber and oil palm-processing mills and also pineapple-canning factories. These industrial activities are not located within the industrial estates but usually operate within or in close proximity to the agricultural schemes.

Essentially, the agro-processing employment is estimated by projecting future cropped area and their productivity per ha. for 1990 and 2000. The output per ha. is subsequently interpreted into labor force sustainable for these periods (See Appendices A and B).

On the whole, agro-processing employment is expected to increase from 5,300 in 1980 to 5,565 and 5,755 in 1990 and 2000 respectively. The sluggish increase is attributed mainly to the loss of existing cropped area for urban development, particularly rubber-processing employment.

Table 4.13 : Agro-Processing Employment (1980 - 2000)

Crop-type mill	1980		1990		2000	
	Emplot.	%	Emplot.	%	Emplot.	%
Rubber-processing	2,195	41	2,135	38	2,025	35
Oil Palm-processing	1,110	21	1,230	22	1,230	21
Pineapple-canning	2,000	38	2,200	40	2,500	44
Total	5,305	100	5,565	100	5,755	100

Source : Study Team Estimates (1981).

The existing number of people employed in rubber-processing industries was estimated at 2,195. This work force is not expected to increase over the next 20 years because as much as 10,000 ha. of existing rubber areas will be converted for housing, industrial, infrastructural and institutional development by 2000 (Refer to Land Use Study, Appendix 2.2). Consequently, rubber-processing work force will steadily decline to 2,135 and 2,025 in 1990 and 2000 respectively.

Oil palm-processing employment on the other hand is expected to increase as over 12,000 ha. of land is expected to be planted with oil palm by 1990, resulting in great production of crop. Thus, its

employment share will increase to 23% in 1980 - 90, thereafter no further change will take place as no new oil palm schemes are foreseeable.

Since 1975, there has been 5 pineapple-canning factories in the Study Area¹⁰, employing some 2,500 workers. It is estimated that the canning industry employed some 2,000 workers in 1980. The work force is expected to increase in 1990 and 2000 taking into account anticipated increases in crop output due to improvements in soil conditions created by the Johor Barat Scheme where much of the Country's pineapple is grown.

(iii) Total Industrial Employment

Total industrial employment in 1980 was established at 58,500. The industrial workforce is expected to be approximately 109,500 and 175,000 by 1990 and 2000 respectively. The increase is accrued mainly to the growth of manufacturing industries.

Existing committed industrial land in Pasir Gudang, Senai and Bandar Penawar which are expected to be fully developed by 1990 will generate some 46,000 jobs. It is estimated that in 1990 - 2000, the creation of some 53,000 out of 65,330 industrial jobs will be through the development of industrial estates. This implies a need for 707 ha. of industrial land in 1990 - 2000, the location of which is within the jurisdiction of the State. It is quite probable that no new industrial sites will be identified by the State until at least the Fifth Malaysia Plan.

10. Socio-Economic Survey of Pineapple growers (1975).

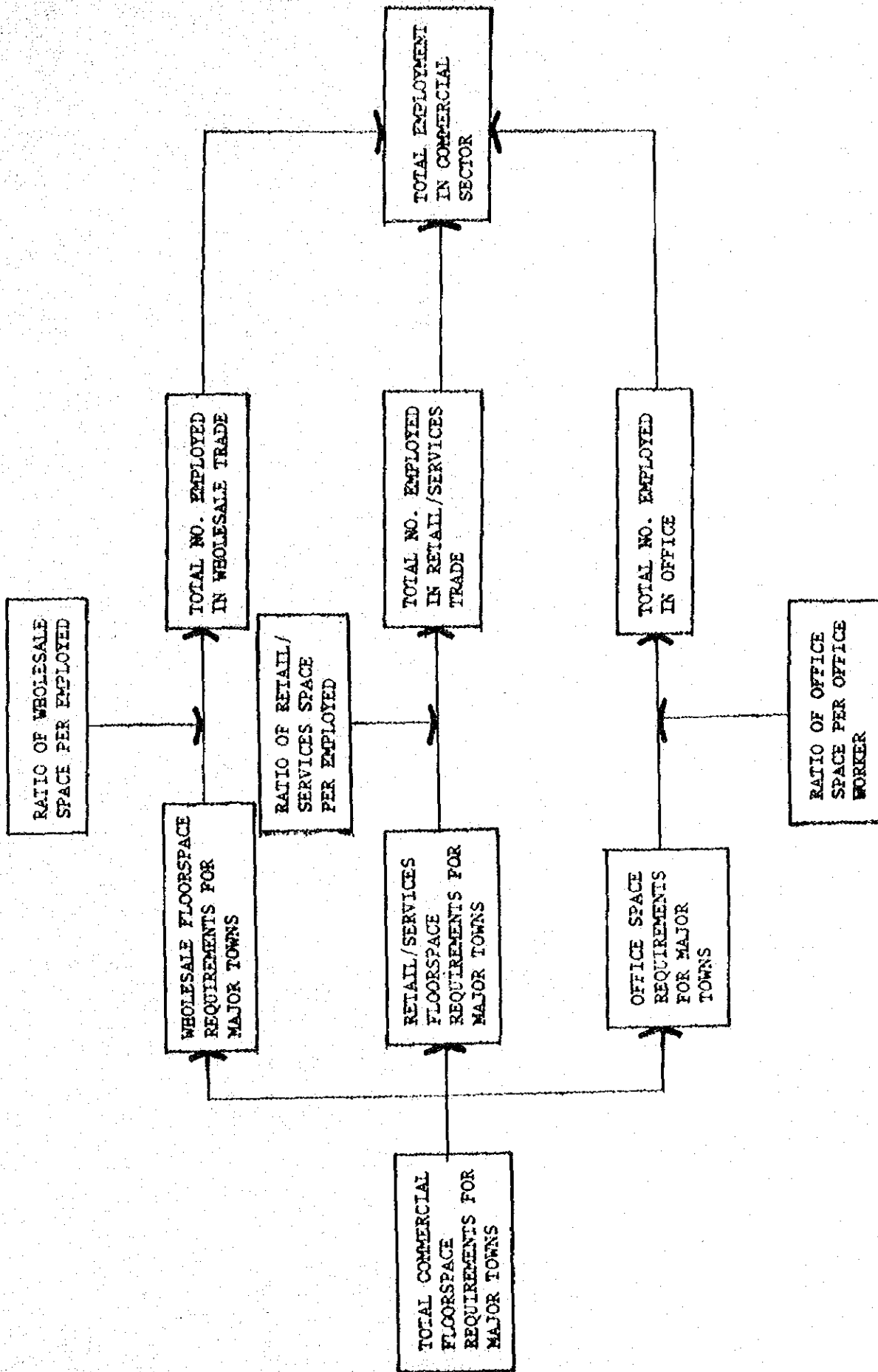


Fig. 4.6 : METHODOLOGY FLOWCHART FOR ESTIMATING COMMERCIAL EMPLOYMENT (1980-2000)

Table 4.14 : Total Industrial Employment (1980 - 2000)

Employment	1980	1990	2000	Increment	
				1980 - '90	1990 - 2000
Manufacturing employment	53,196	103,880	169,210	50,684	65,330
Agro-processing employment	5,305	5,565	5,755	260	190
Total industrial employment	58,501	109,445	174,965	50,944	65,520

Source : Study Team Estimates (1981).

A comparison of the estimated demand for industrial labor force with that targetted by the productivity assumption method (Refer Table 4.7), indicates that there is a surplus of demand by more than 2,000 in 1990 but a shortfall of about 9,000 by 2000.

(c) Employment Demand for Commercial Services Sector

The commercial sector comprises of 3 main trades:

- . Wholesale trades
- . Retail/Services trades
- . Office subsector

In the Land Use Study (Section 4.3), the existing and future requirements for commercial floorspace was estimated based on the correlation of commercial development to town size. The method broadly reflects the demand for commercial services goods (in terms of floorarea) as the size of a town increases. Subsequently, the demand for employment in the commercial sector is derived from the estimated demand for commercial floorspace using the ratio of commercial type floorspace per commercial worker. The methodology employed is shown in Fig. 4.6.

Table 4.15 : Commercial Floorspace Requirements (1980 - 2000)

Establishments	Floorspace ('000 sq. ft.)			% Distribution		
	1980	1990	2000	1980	1990	2000
Offices	2,288	6,147	9,099	20	27	31
Retail/Services	8,588	14,706	17,828	74	65	60
Wholesale	677	2,066	2,763	16	8	9
Total	11,563	22,719	29,690	100	100	100

Source : Study Team Estimates (1981).

The following space standards were employed to estimate the demand for commercial - services employment :

Office space : 100 sq. ft. per worker (1980)¹¹
 130 sq. ft. per worker (1990 a-d 2000)¹²

Retail/Service space: 250 sq. ft. per worker¹³

Wholesale space: 200 sq. ft. per worker¹³

It was estimated that there were 60,600 workers in the commercial-services sector in 1980. Of this, approximately half were engaged in retail and services and the remainder were wholesale and office workers. The labor force demand in the commercial-services sector is expected to be 110,150 in 1990 and 145,790 in 2000 (See Table 4.16).

11. South Johor Regional Study (1974).

12. Study Team Estimate (1981).

13. L.H. Lee and A.H. Lee, Planning Standards for the Design of Urban Settlements, USM (1980) - unpublished report.

Table 4.16 : Commercial-Service Employment (1980 - 2000)

Establishments	Employment			% Distribution		
	1980	1990	2000	1980	1990	2000
Offices	22,880	40,980	60,660	38	37	42
Retail/Services	34,350	58,830	71,310	57	53	49
Wholesale	3,390	10,340	13,820	5	10	9
Total	60,620	110,150	145,790	100	100	100

Source : Study Team Estimates (1981).

The increment demand for commercial workers in the following 10 years is estimated at 49,530; and that for the period 1990 - 2000 is 35,640. The increment in 1980 - 90 is expectedly larger in view of the growth stimulus provided by current government investments within the Study Area. A comparison of the demand estimates with the services employment targets using the productivity assumption method shows that existing employment in this sector has not expanded as fast as anticipated over the past 10 years. However, the demand is expected to exceed the target estimates in 1990 and 2000 taking into consideration commitments both private and public, which have growth stimulus effects on commercial sector development.

5.0 HOUSEHOLD INCOME

5.1 Income Trends and Differentials

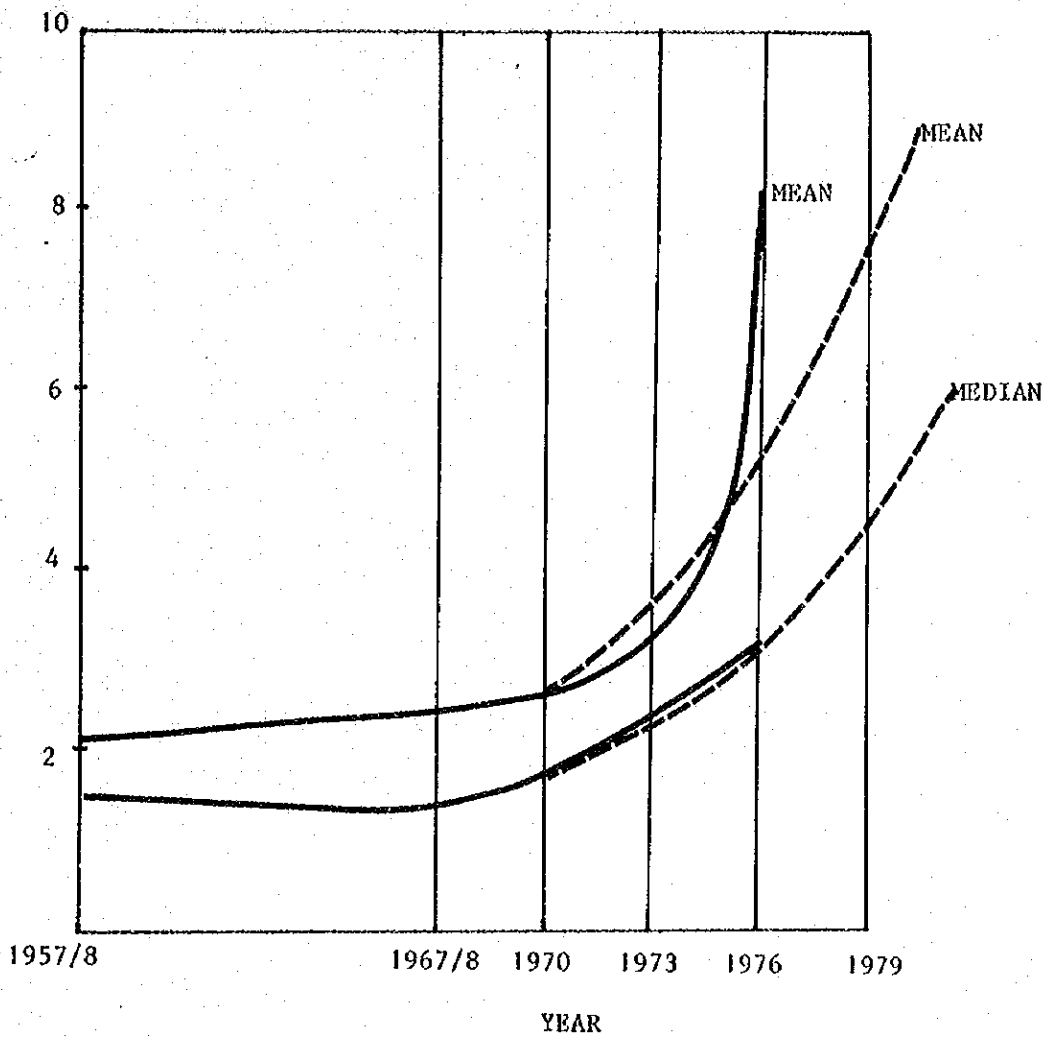
Table 5.1 and Fig. 5.1 show the changes in mean and median household income by ethnicity from 1970 to 1979 in Peninsular Malaysia. In 1970, the mean monthly income of an average household of 5.5 persons in the Peninsula was M\$246 and this grew to a mean of M\$459 (at constant 1970 prices) in 1979, at an average growth rate of 6.3 percent per annum. By ethnicity, in spite of the fact that Malay income ranked among the lowest in the last decade, their mean income as a proportion of national average, had increased substantially from 65.2 percent in 1970 to 67.3 percent in 1979. Chinese mean income had decreased from 149 percent in 1970 to 144 percent in 1979.

Table 5.1 : Mean and Median Incomes in Peninsular Malaysia (\$ per household per month)

Ethnicity		In constant 1970 prices				Annual growth rate 1971-79 (%)	In current prices			Annual growth rate 1971-79 (%)
		1970	1973	1976	1979		1973	1976	1979	
Malay	mean	172	209	237	309	6.7	242	345	513	12.9
	median	120	141	160	200	5.8	163	233	332	12.0
Chinese	mean	394	461	540	659	5.9	534	787	1,094	12.0
	median	268	298	329	383	4.1	343	480	630	10.1
Indian	mean	304	352	369	467	4.9	408	538	776	11.0
	median	194	239	247	314	5.5	277	360	522	11.6
Others	mean	813	1,121	870	1,132	3.8	1,299	1,268	1,881	9.8
	median	250	306	270	331	3.2	355	394	550	9.2
All	mean	264	313	353	459	6.3	362	514	763	12.5
	median	166	196	215	270	5.6	227	313	449	11.7
Urban	mean	428	492	569	675	5.2	570	830	1,121	11.3
	median	265	297	340	368	3.7	345	495	611	9.7
Rural	mean	200	233	269	355	6.6	269	392	590	12.8
	median	139	159	180	230	5.8	184	262	382	11.9

Source: Post Enumeration Survey of 1970 Population and Housing Census, Household Income Survey 1973, Labour Force Survey 1974 (reference 1973)

Agriculture Census 1977 (reference 1976) and Labour Force Survey 1980 (reference 1979)



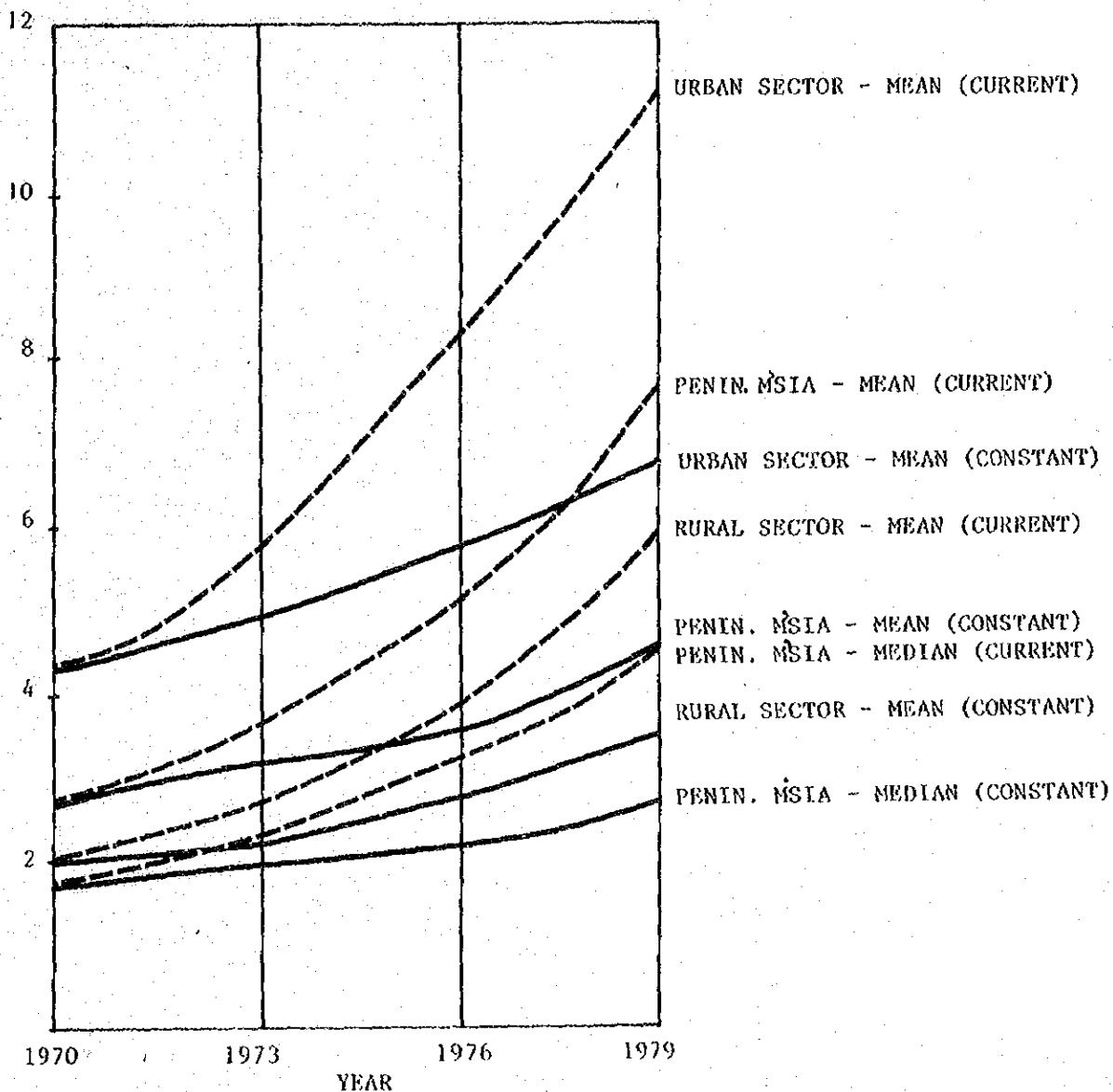
LEGEND

— PROJECTED BY DR J.K. SUNDARAM & ISHAK SHARI, 'INCOME REDISTRIBUTION AND THE STATE IN PENINSULAR MALAYSIA', MARCH 1981

- - - FOURTH MALAYSIA PLAN

Fig. 5.1 : MEAN AND HOUSEHOLD INCOME IN PENINSULAR MALAYSIA 1957-1979,
(AT CURRENT PRICES)

Although the mean urban household incomes were higher than rural incomes, the growth of the latter had been much faster. But, in both instances, inequality had been decreasing over the last decade. (See Fig. 5.2).

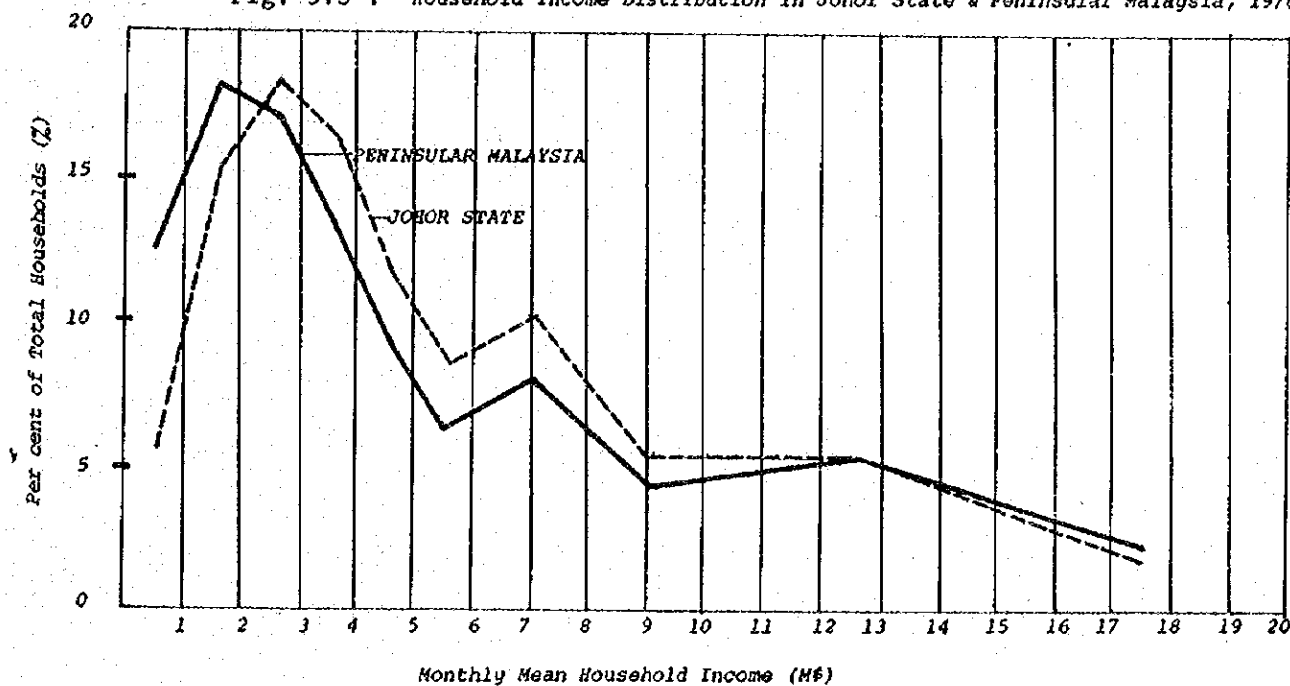


Source: Fourth Malaysia Plan

Fig. 5.2 : MEAN AND MEDIAN HOUSEHOLD INCOMES IN PENINSULAR MALAYSIA, 1970-79.

In Peninsular Malaysia and the Johor State, the monthly gross household income earned in 1976 was correlated with the monthly gross household income class (See Tables 5.2 and 5.3) and the income distributions so obtained are as depicted in Fig. 5.3. In the Peninsula, 18.2 percent of the total households receiving household income range of M\$100-200, constituted the largest proportion of households in the Peninsula. Comparatively, the income distribution in 1976 in the state of Johor consisted of a higher proportion of households earning higher incomes than that in the Peninsula.

Fig. 5.3 : Household Income Distribution in Johor State & Peninsular Malaysia, 1976



Source: Agricultural Census, 1976

Table 5.2 : Number of Households, Monthly Gross Household Income Earned By Monthly Gross Household Income Class In Peninsular Malaysia 1976

MONTHLY GROSS HOUSEHOLD INCOME CLASS ¹	TOTAL PENINSULAR MALAYSIA			URBAN		RURAL	
	NO. OF HOUSEHOLDS (%)	INCOME ² (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	
Less than \$100	249986 (12.8)	15108.1 (1.5)	16856 (3.1)	993.5 (0.2)	233130 (16.5)	14114.6 (2.5)	
\$100 <	178378 (9.1)	22016.3 (2.2)	17446 (3.2)	2126.8 (0.5)	160932 (11.4)	19889.5 (3.6)	
\$150 <	179343 (9.1)	31087.1 (3.1)	26951 (5.0)	4664.4 (1.0)	152392 (10.8)	26422.7 (4.7)	
\$200 <	337829 (17.2)	82822.9 (8.2)	76970 (14.2)	18932.8 (4.2)	260859 (18.4)	63890.1 (11.5)	
\$300 <	260128 (13.3)	89645.0 (8.9)	75382 (13.9)	25950.8 (5.8)	184746 (13.0)	63694.2 (11.5)	
\$400 <	182112 (9.3)	80787.8 (8.0)	61234 (11.3)	27132.8 (6.0)	120878 (8.5)	53665.0 (9.7)	
\$500 <	122478 (6.2)	66755.5 (6.6)	44268 (8.1)	24113.3 (5.4)	78210 (5.5)	42642.2 (7.7)	
\$600 <	156408 (8.0)	107370.7 (10.7)	64014 (11.8)	44077.1 (9.8)	92394 (6.5)	63293.6 (11.4)	
\$800 <	88570 (4.5)	78624.0 (7.8)	41554 (7.6)	36986.3 (8.2)	47016 (3.3)	41637.7 (7.5)	
\$1000 <	101814 (5.2)	122730.8 (12.2)	54436 (10.0)	65673.6 (14.6)	47378 (3.3)	56837.2 (10.2)	
\$1500 <	43056 (2.2)	73402.5 (7.3)	25642 (4.7)	43719.1 (9.7)	17414 (1.2)	29683.4 (5.3)	
\$2000 ≥	60839 (3.1)	235988.3 (23.5)	38868 (7.1)	156014.2 (34.6)	21971 (1.6)	79974.1 (14.4)	
TOTAL	1960941 (100.0)	1006339.0 (100.0)	543621 (100.0)	450384.7 (100.0)	1417320 (100.0)	555734.3 (100.0)	

Source: Agricultural Census 1976

Note: (1) Income data as presented refers to average gross household income ie. the average gross income earned by all income recipients of the household per month in 1976.

Gross Household income includes earnings from paid employment, net income from agricultural holdings and other businesses, net property income and transfer receipts. Gross income is income before deductions for transfer payments such as income tax, other direct taxes and remittances to other households.

(2) Monthly gross household income.

Table 5.3 : Number of Households, Monthly Gross Household Income Earned By Monthly Gross Household Income Class In Johore State 1976

MONTHLY GROSS HOUSEHOLD INCOME CLASS ¹	TOTAL JOHORE STATE			URBAN			RURAL		
	NO. OF HOUSEHOLDS (%)	INCOME ² (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)			
Less than \$100	14520 (5.4)	951.3 (0.7)	886 (1.2)	50.2 (0.1)	13634 (6.9)	901.1 (1.0)			
\$100 <	18563 (6.9)	2316.1 (1.7)	1171 (1.6)	142.9 (0.3)	17392 (8.8)	2173.2 (2.5)			
\$150 <	22163 (8.2)	3864.1 (2.8)	2897 (3.9)	511.8 (1.0)	19266 (9.8)	3352.3 (3.9)			
\$200 <	49271 (18.2)	12131.4 (8.8)	10390 (14.1)	2545.9 (4.8)	38881 (19.8)	9585.5 (11.2)			
\$300 <	44133 (16.3)	15266.8 (11.0)	11572 (15.7)	4018.4 (7.6)	32561 (16.6)	11248.4 (13.1)			
\$400 <	31867 (11.8)	14177.5 (10.2)	9980 (13.5)	4432.2 (8.4)	21887 (11.1)	9745.3 (11.3)			
\$500 <	22907 (8.5)	12487.9 (9.0)	7267 (9.9)	3956.3 (7.5)	15640 (8.0)	8531.6 (9.9)			
\$600 <	27494 (10.2)	18822.5 (13.6)	9956 (13.5)	6839.6 (13.0)	17538 (8.9)	11982.9 (14.0)			
\$800 <	14764 (5.4)	13086.6 (9.4)	6786 (9.2)	6051.8 (11.5)	7978 (4.1)	7034.8 (8.2)			
\$1000 <	14715 (5.4)	17802.5 (12.8)	7228 (9.8)	8890.4 (16.9)	7487 (3.8)	8912.1 (10.4)			
\$1500 <	5071 (1.9)	8557.7 (6.2)	3060 (4.2)	5133.4 (9.7)	2011 (1.0)	3424.3 (4.0)			
\$2000 >=	4878 (1.8)	19106.2 (13.8)	2517 (3.4)	10096.1 (19.2)	2361 (1.2)	9010.1 (10.5)			
TOTAL	270346 (100.0)	138570.6 (100.0)	73710 (100.0)	52669.0 (100.0)	196636 (100.0)	85901.6 (100.0)			

Source: Agricultural Census 1976

Note: (1) Income data as presented refers to average gross household income ie, the average gross income earned by all income recipients of the household per month in 1976.

Gross Household income includes earnings from paid employment, net income from agricultural holdings and other businesses, net property income and transfer receipts. Gross income is income before deductions for transfer payments such as income tax, other direct taxes and remittances to other households.

(2) Monthly gross household income.

Per capita monthly household distribution in Peninsula Malaysia in 1976 showed approximately 70 percent of the households have per capita income of less than M\$100 per month. (See Table 5.4). In the urban sector, there is lesser households of 50 percent earning per capita monthly income of less than M\$100 whilst in the rural sector, as much as 67 percent of households earned less than M\$100 per month. Such exemplified the vast income inequality between the urban and rural sectors.

Similarly, for Johor State, the per capita monthly income of less than M\$100 goes to 67 percent of the households which is slightly better than the Peninsular's situation. (See Table 5.5). However in terms of sectoral differentials, the situation showed more disparity in that almost 48 percent of households in the urban sector received income less than M\$100 whilst it was approximately 82 percent of households in the rural sector.

Table 5.4 : Number of Households, Monthly Gross Household Income earned by per capita Monthly Gross Household Income Class by sector in Peninsular Malaysia 1976

Per Capita Monthly Gross Household Income Class	TOTAL PENINSULAR MALAYSIA			URBAN			RURAL		
	NO. OF HOUSEHOLDS (%)	INCOME ² (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)			
\$ 20	195340(10.0)	15244.0(1.5)	11982(2.2)	963.2(0.2)	183358(12.9)	14280.8(2.6)			
\$ 20 < \$ 30	191836(9.8)	28964.3(2.9)	19615(3.6)	3552.1(0.8)	172221(12.2)	25412.2(4.6)			
\$ 30 < \$ 40	204376(10.4)	42908.4(4.3)	32291(5.9)	7703.1(1.7)	172085(12.1)	33205.3(6.3)			
\$ 40 < \$ 60	348618(17.8)	101719.4(10.1)	76466(14.1)	25197.4(5.6)	272152(19.2)	76522.0(13.8)			
\$ 60 < \$ 80	247923(12.6)	96840.1(9.6)	71796(13.2)	31157.8(6.9)	176127(12.4)	65682.3(11.8)			
\$ 80 < \$100	174617(8.9)	83290.5(8.3)	58993(10.9)	31096.8(6.9)	115624(8.2)	52193.7(9.4)			
\$100 < \$125	147760(7.5)	82611.2(8.2)	55659(10.2)	34052.7(7.5)	92101(6.5)	48558.8(8.7)			
\$125 < \$150	93403(4.8)	60763.1(6.0)	37523(6.9)	26875.4(6.0)	55880(3.9)	33887.7(6.1)			
\$150 < \$200	115802(5.9)	86282.6(8.6)	50039(9.2)	40864.4(9.1)	63765(4.7)	45418.2(8.2)			
\$200 < \$300	110013(5.6)	107178.9(10.6)	54310(10.0)	57310.7(12.7)	55703(3.9)	49868.2(9.8)			
\$300 < \$400	48166(2.5)	63181.4(6.3)	25511(4.7)	36393.3(8.1)	22655(1.6)	26788.1(4.0)			
≥ \$400	83087(4.2)	237355.8(23.6)	49436(9.1)	155417.6(34.5)	33691(2.4)	81938.2(14.7)			
Total :	1960941(100.0)	1006339.7(100.0)	543621(100.0)	450584.5(100.0)	1417320(100.0)	555754.9(100.0)			

Source: Agricultural Census 1976

Note : (1) Per capita monthly gross household income - monthly gross household income divided by number of persons in the household.
(2) Monthly Gross Household Income.

Table 5.5 : Number of Households, Monthly Gross Household Income earned by per capita Monthly Gross Household Income Class by sector in Johor State 1976

Per Capita 1 Monthly Gross Household Income Class	TOTAL JOHOR			URBAN		RURAL	
	NO. OF HOUSEHOLDS (%)	INCOME ² (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	NO. OF HOUSEHOLDS (%)	INCOME (\$'000) (%)	
\$ 20	13450 (5.0)	1390.7 (1.0)	607 (0.8)	47.5 (0.1)	12843 (6.5)	1343.2 (1.6)	
\$ 20 < \$ 30	20516 (7.6)	3606.5 (2.6)	1838 (2.5)	372.7 (0.7)	18678 (9.5)	3233.8 (3.8)	
\$ 30 < \$ 40	25729 (9.5)	6087.8 (4.4)	3817 (5.2)	1048.2 (2.0)	21912 (11.2)	5039.6 (5.9)	
\$ 40 < \$ 60	50501 (18.7)	16345.7 (11.8)	10796 (14.6)	3799.7 (7.2)	39705 (20.2)	12546.0 (14.6)	
\$ 60 < \$ 80	40180 (14.8)	17363.4 (12.5)	9657 (13.1)	4559.2 (8.7)	30523 (15.5)	12804.2 (14.9)	
\$ 80 < \$ 100	30748 (11.4)	15422.5 (11.1)	9728 (13.2)	5343.8 (10.1)	21020 (18.7)	10078.7 (11.7)	
\$ 100 < \$ 125	24846 (9.2)	14390.4 (10.4)	8606 (11.7)	5353.3 (10.2)	16240 (8.3)	9037.5 (10.5)	
\$ 125 < \$ 150	14846 (5.5)	9375.2 (6.8)	4997 (6.8)	3508.6 (6.7)	9849 (5.0)	5866.6 (6.8)	
\$ 150 < \$ 200	18873 (7.0)	13352.5 (7.6)	8489 (11.5)	6453.3 (12.2)	10384 (5.3)	6899.2 (8.0)	
\$ 200 < \$ 300	16236 (6.0)	14398.6 (10.4)	7589 (10.3)	7097.2 (13.5)	8647 (4.4)	7301.4 (8.5)	
\$ 300 < \$ 400	6030 (2.2)	6666.5 (4.8)	2999 (4.1)	3656.4 (6.9)	3031 (1.5)	3010.1 (3.5)	
\$ 400	8391 (3.1)	20171.1 (14.6)	4587 (6.2)	11429.6 (21.7)	3804 (1.9)	8741.5 (20.2)	
Total	270346 (100.0)	138570.9 (100.0)	73710 (100.0)	52669.3 (100.0)	196636 (100.0)	85901.8 (100.0)	

Source: Agricultural Census 1976

Note : (1) Per capita monthly gross household income - monthly gross household income divided by number of persons in the household.

(2) Monthly Gross Household Income.

In terms of proportion of total income earned, within the Peninsular, income differences are considerable. Approximately, two-thirds of all income goes to the top 20 percent of income earners whilst the bottom 40% received one-ninth of all incomes. (See Fig. 5.4). Like the pattern in Kuala Lumpur, the income distribution in the state of Johor in 1976 showed less disparity in that half of all incomes accrued to the top 20 percent of income earners whilst the bottom 40 percent received one-seventh of all incomes.

PROPORTION OF POPULATION	PROPORTION OF TOTAL INCOME EARNED		
TOP 20%	49.9%	55.2%	57.7%
MIDDLE 40%	35.3%	32.0%	31.2%
BOTTOM 40%	14.8%	12.8%	11.1%
	JOHOR	KUALA LUMPUR	PENINSULAR MALAYSIA

source : Agricultural Census 1976.

Fig. 5.4 : MONTHLY HOUSEHOLD INCOME, JOHOR, KUALA LUMPUR AND PENINSULAR MALAYSIA IN 1976.

5.2 Future Household Income Projections

5.2.1 General Methodology

The income growths in the State and the Peninsula projected at constant 1970/76 prices, are based on the two approaches of past trend and correlations of per capita Gross Domestic Product/ Gross Regional Product. With underlying considerations of future expectations of inflationary trends, increased productivity per employed person, decreasing household sizes and increasing number of employed persons per household, the estimated future household monthly income at constant prices can be translated into current prices.

The only available base income data for Johor State are the Agricultural Census (1976). Preliminary future household income growths in the State are based on assumption that the income growth in the State should at least be targetted to grow at the same rate as the Peninsula ie. at 6.3 per cent¹⁴. The urban and rural sectors in the State are envisaged to grow at 5.2 and 6.6 percent per annum. These growth rates compared credibly with past rates. In particular, on the average, the urban

14. Source : Post enumeration Survey of 1970 Population and Housing Census, Household Income Survey 1973, Labour Force Survey 1974 (Reference 1973), Agriculture Census 1977 (Reference 1976) and Labour Force Survey 1980 (Reference 1980).

household incomes of \$370¹⁵ in 1970 were derived basing on average household incomes earned in towns like Johor Bahru, Kota Tinggi, Skudai, etc and this yielded approximately an average growth of 5 percent per annum from 1970-76.

To further check the figures, the present and projected per capita GRP were correlated with the mean monthly household incomes in the State (see Fig 5.5). In this way, future estimates of the mean household income can be obtained (See Table 5.6). These results are similar to those projected by past trend approach. (see Table 5.7).

Similarly to derive future estimates of household incomes for Peninsular Malaysia, per capita GDP are correlated with the mean monthly household incomes in the Peninsula.

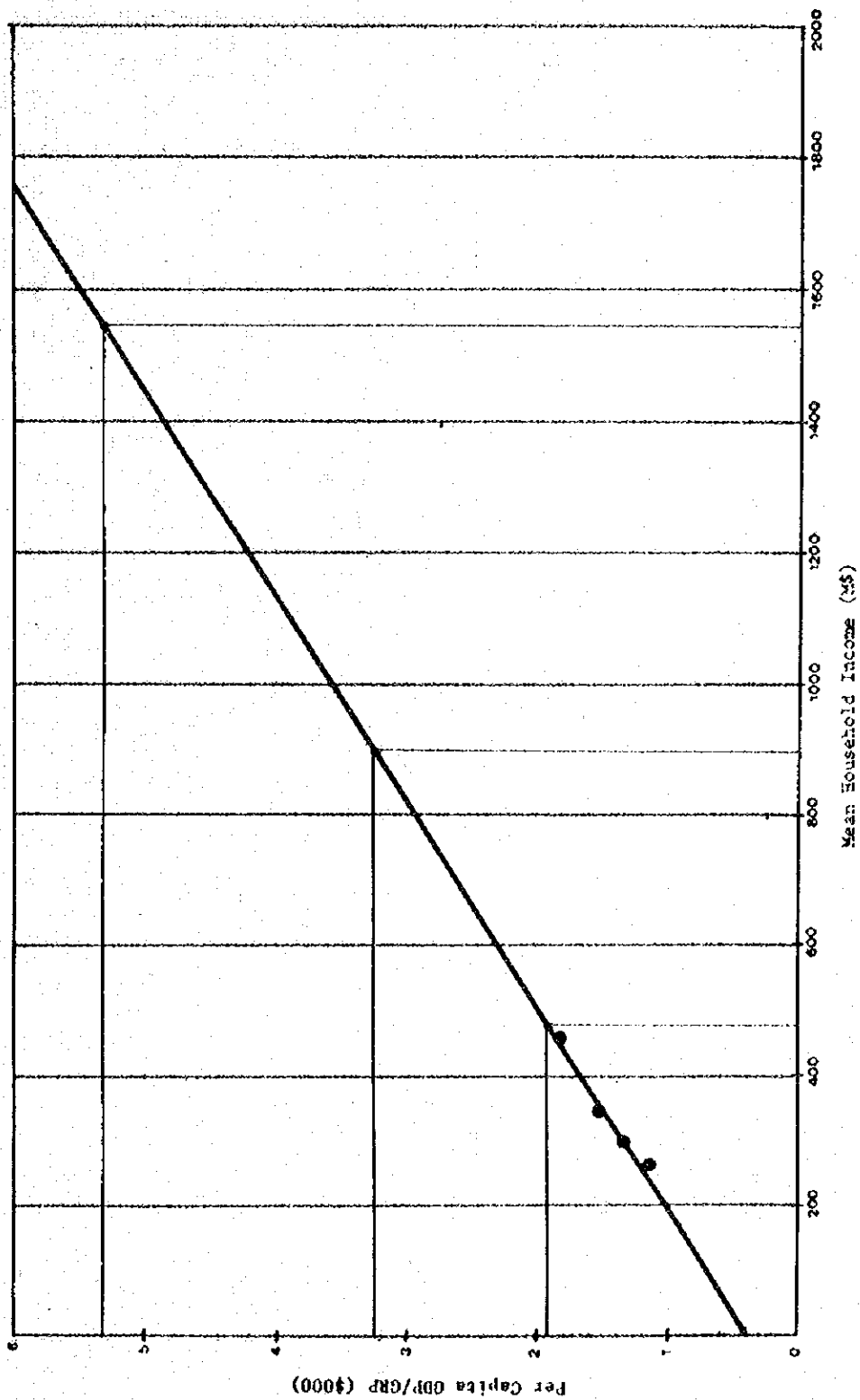
Table 5.6 : CORRELATION OF PER CAPITA GDP/GRP WITH MEAN MONTHLY HOUSEHOLD INCOME 1970-2000. (at constant 1970)

	1970	1973	1976	1979	1980	1990	2000
Per Capita GDP (\$)	1,172.2	1,362.4	1,533.0	1,795.3 ¹	1,836.0 ¹	3,128.5 ¹	5,315 ¹
Mean Household Income in Peninsular Malaysia	264	313	353	459	470 ²	890 ²	1,530 ²
Per Capita GRP (\$)	1,083.7	1,282.7	1,441.0	1,694.4	1,726.0	3,057.3	5,630
Mean Household Income in Johor State	220	260	320	400	430	830	1,640

Sources: 1) Fourth Malaysia Plan

2) Study Team Correlation Estimates, 1981.

FIG. 5.5 Correlation of per capita GDP/GNP with Mean Monthly Household Income (M\$)
 - At Constant 1970 Prices



5.2.2 Future Income Projections

Mean monthly household incomes in the state and the Peninsular are expected to grow in view of the anticipation of economic growth in the state and the nation, of increased productivity per employed persons, decreasing household sizes but with increasing number of employed persons per household. At constant 1970 prices, the average household income earned per month in the state is predicted to grow from M\$354 in 1976 to M\$412 in 1980, M\$651 in 1990 and M\$1008 by 2000. Urban household incomes are much higher than rural incomes but nevertheless, the latter is envisaged to grow at a faster rate, thereby over the years, narrowing the gap of inequality between urban-rural distributions. (See Table 5.7).

In Peninsular Malaysia, mean household incomes at constant 1970 prices, are predicted to grow from M\$459 in 1979 to M\$890 in 890 in 1990 and reaching M\$1,530 in the year 2000. (See Table 5.6).

Table 5.7 : Rural-urban Size Distribution of Mean Monthly Household Income, Johor State 1976-2000 (at constant 1976 prices)

	Mean Monthly Household Income ² (M\$)			
	1976	1980	1990	2000
Urban Johor	715 ¹	880	1,289	1,983
Rural Johor	437	515	831	1,315
Johor State 1976 prices	513	600	651	1,008

Note: 1) Source: Agricultural Census, 1976

2) Income predictions for the period 1980-1990 are based on the average growth rates of 4.5% for Urban sector and 6.6% for Rural sector. Whereas, income projections for the period 1990-2000 are based on the average growth rates of 4.4% for Urban sector and 4.7% for Rural sector.

6.0 MOTOR VEHICLE OWNERSHIP

6.1 An Overview

In recent times, the two kinds of population explosions that are worrying authorities in most parts of the world are nonetheless, of people and of motor vehicles. In a way, motor vehicles may be regarded as a separate population in a region or country with their own spatial requirements, activities and patterns. This vehicle population which is largely related to income determinants, is non-homogenous, comprising of different vehicular types, with each having its own specific trends of growth and interactions with their immediate environment.

This section discusses some important aspects of vehicle population such as trends of growth in absolute and relative terms, proportions of different types between and when related to people. The comparisons cover the entire Peninsular Malaysia and the various states in order to see whether all show similar trends and characteristics. Apart from these, the future vehicle ownership will be forecasted based on two approaches viz.

Notwithstanding the fact that the growth of vehicle population had been following an exponential curve, this growth is not expected to continue indefinitely due to two principal reasons, namely:-

- (1) The human population itself cannot increase indefinitely along an exponential curve and therefore, at some threshold point, the increase of vehicles will slow down as well; and
- (2) Economic slow-down, rising prices of fuel and in the extreme case of environmental deterioration, the growth of motor-vehicles are expected to be affected. Indeed, a decline has already been noted since the energy crisis of 1973 and the subsequent

economic slump, trend growth pattern as well as on income-level determinants.

6.2 Increase of
Vehicle
Population in
Malaysia

6.2.1 Past Trends

The increase in Peninsular Malaysia's vehicle population during the past two decades has been phenomenal. Table 6.1 and Fig. 6.1 represent the trends of increase in Peninsular Malaysia where the increase seems to accelerate with time (see also Appendix C). For instance, the number of motor vehicles in Peninsular Malaysia grew by 13 percent per annum from 293,014 vehicles in 1963 to 2,357,386 vehicles in 1980. However, in terms of annual average growth over the years, the yearly rates exemplified fluctuating trends but from 1977 till 1979, the trend was on the decline but increases, rapidly at 18.5 percent from 1979 to 1980.

In comparison, the growth of motor-cycles have been at a much faster pace than motor-cars. Over the years, the growth of taxis and buses have been relatively slow as compared to other vehicles (see Fig. 6.1).

Table 6.1: MOTOR VEHICLES BY TYPE REGISTERED IN PENINSULAR MALAYSIA 1963-1981

Year	Motor Cycles	Motor Cars	Buses	Taxis	Lorries and Van	Other Motor Vehicles	Total	Av. Annual Growth Rate %
1. 1963	112,086	124,651	3,332	5,073	35,637	12,235	293,014	16.9%
2. 1964	142,746	139,049	3,543	5,135	38,449	13,469	342,391	15.4%
3. 1965	175,842	154,277	3,763	5,301	41,854	14,081	395,118	14.4%
4. 1966	214,691	169,008	3,967	5,443	44,411	14,482	452,002	11.8%
5. 1967	251,529	182,447	4,234	5,608	46,502	15,135	505,455	8.4%
6. 1968	278,836	194,712	4,636	5,749	48,301	15,628	547,952	10.4%
7. 1969	312,686	213,247	5,347	6,029	51,375	16,681	605,362	10.6%
8. 1970	350,049	231,539	5,932	6,827	55,823	19,124	669,294	10.4%
9. 1971	389,133	253,491	6,447	7,377	60,543	22,174	739,165	10.8%
10. 1972	435,334	279,300	6,839	7,427	64,979	24,778	818,657	14.8%
11. 1973	507,096	316,894	7,274	7,562	72,164	28,961	939,951	17.1%
12. 1974	611,822	357,910	7,738	8,200	81,584	33,031	1,100,285	15.2%
13. 1975	722,309	398,014	8,688	9,239	92,207	36,662	1,267,119	12.8%
14. 1976	830,834	436,939	9,735	10,432	101,620	40,295	1,429,845	13.4%
15. 1977	951,080	491,933	10,545	11,285	112,025	44,403	1,621,271	12.9%
16. 1978	1,079,020	555,358	11,589	12,051	122,543	49,397	1,829,958	8.7%
17. 1979	1,183,391	595,600	12,094	12,034	131,723	54,084	1,989,391	18.5%
18. 1980	1,391,899	714,742	13,079	14,347	154,533	68,786	2,357,386	7.3%
19. 1981*	1,495,956	766,333	13,488	16,027	163,192	75,498	2,530,494	

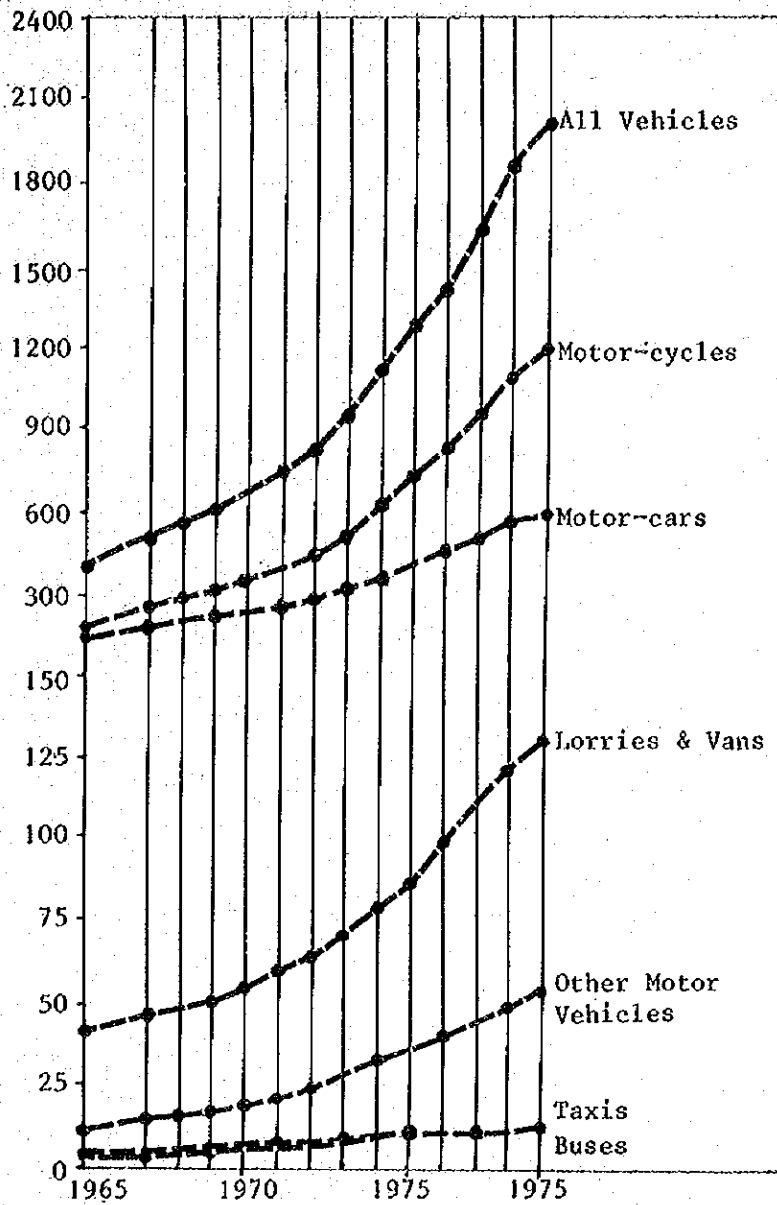
NOTES:

1. Vehicle figures given are cumulative totals of previous years.
2. The figures for hired cars, "hire and drive" cars are included under taxis
3. The vehicle types included are tractors, rollers, trailers, etc.

Source: Road Transport Department, Ministry of Transport, Kuala Lumpur.

* as at 31st July, 1981.

Fig. 6.1 : Peninsular Malaysia's Vehicle Population 1965-79
(Cumulative)



Source : Road Transport Department, Ministry of Transport, Kuala Lumpur.

6.2.2 Vehicular Composition

The analysis of growth of vehicle composition over the years 1965 to 1979 in Peninsular Malaysia showed that with the exception of motor-cycles, all the other vehicle types are on the decline (see Fig. 6.2). Motor-cycles have predominated in the overall percentage composition of vehicles and such trend is unlikely to vary much in the future. Motor-cars, constituting the second major vehicular type after motor-cycles, were having decreasing compositional trend over the past years.

The composition of lorries and vans, on the other hand, have remained relatively unchanged and the same is true with taxis and buses. It may also be inferred from this vehicular composition pattern that the role of public transport still have yet to gain much importance in the context of transportation in Peninsular Malaysia.

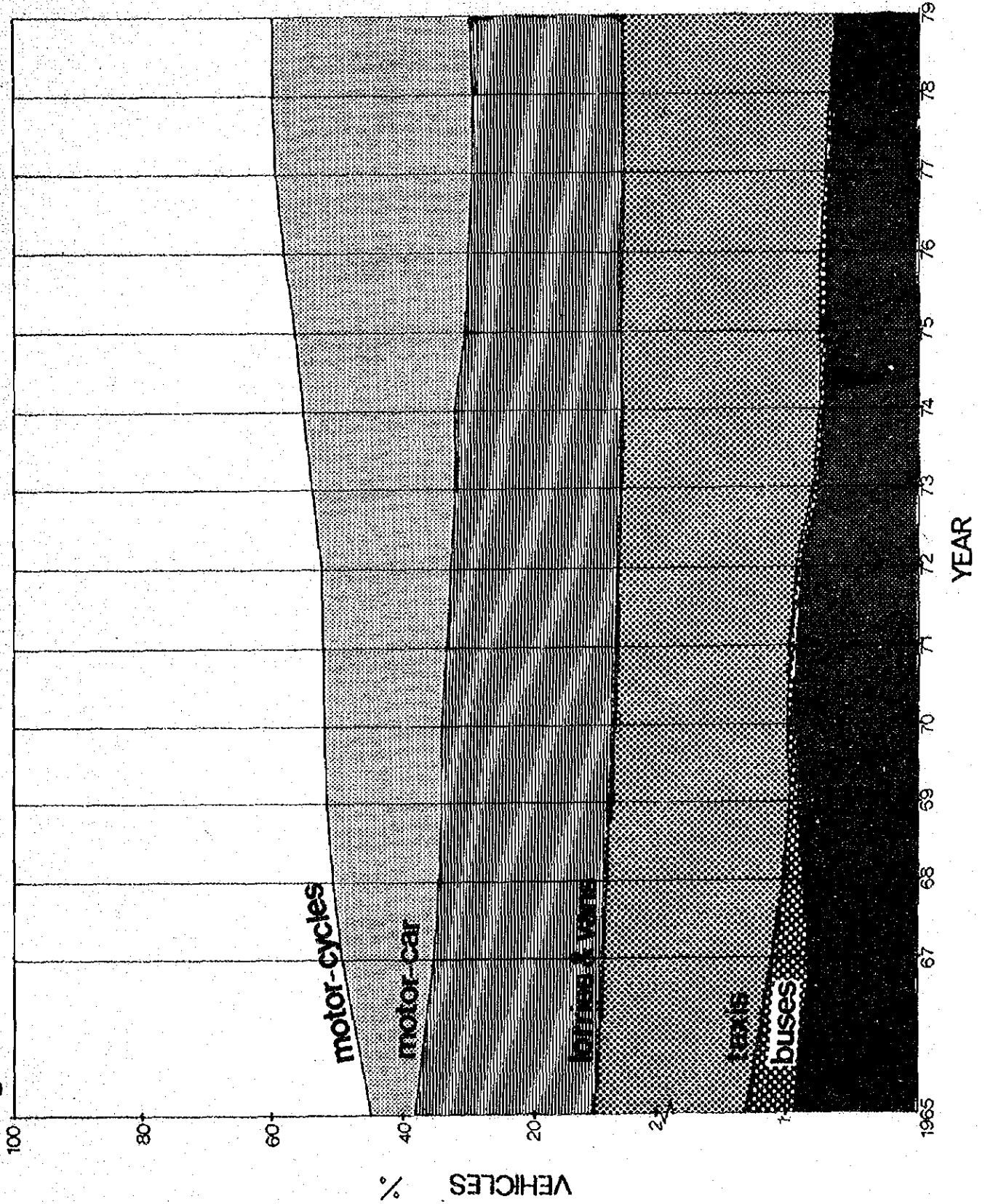
6.3 Motorization and Vehicle Ownership

6.3.1 Significance of Motorization

Apart from the analysis of growth of vehicles in absolute terms and of its compositional change over the years, it is important to recognise the usefulness of the Motorization¹⁶ component as it constitutes one of the most important factors in transportation analysis and the basis for forecasting future travel characteristics. The greater significance of the ratio of number of cars and population over the absolute number of cars can be recognised from the fact that although in 1970, Johor State has 14.5 percent of Peninsular Malaysia's population (which is higher than the figure of 11.1 percent in Selangor), there are only 27,376 private motor

16. H is essentially the ratio of number of cars to the human population, often expressed as the number of cars per 100/1000 population or the number of cars per household.

Fig 6.2: COMPOSITION OF VEHICLES, PENINSULAR MALAYSIA 1965-79.



cars as compared to 82,958 cars in Selangor State (see Table 6.2). In this relation, the motorization levels of Johor State in 1970 and 1980 which are 2.1 and 7.3 respectively are slightly lower than that of Selangor.

Of significance is the comparison of Johor State with that of Peninsular Malaysia which showed that in 1970, the Johor State has motorization level which is below the corresponding figure in Peninsular Malaysia. However, the reverse is true in 1980. This implied that the growth of motor-cars in relation to its population increase in the State of Johor has outstripped that in the case of Peninsular Malaysia.

Table 6.2: MOTORIZATION OF PRIVATE MOTOR-CARS IN SOME STATES IN PENINSULAR MALAYSIA 1970 AND 1980.

	1970			1980		
	No. of motor -cars ¹	Population ²	No. of cars/ 100 population	No. of Motor -cars	Population ³	No. of cars/ 100 population
Johor	27,376	1,273,990	2.1	117,581	1,601,504	7.3
Penang	28,326	776,124	3.6	75,812	911,586	8.3
Selangor	82,958	982,090	8.4	214,258	1,467,441	14.6
Peninsular Malaysia	231,539	8,809,557	2.6	714,742	11,138,000	6.4

Sources: (1) Road Transport Department, Ministry of Transport, K.L.

(2) Department of Statistics, 'Population Census 1970'

(3) Ibid, 'Preliminary Fieldcount 'Summary of 1980 Census'.

6.3.2 Motorization in Peninsular Malaysia

Table 6.3 represent the levels of motorization by various types of vehicles in Peninsular Malaysia for the period 1970 to 1979. The trend showed that the rate of increase of motorization over time is slow for taxis and buses which occupy low levels of motorization. On the other hand, the motorization of motor-cycles is relatively high, increasing rapidly - the slope of line is the steepest among all the vehicles. For motor-cars, its motorization increases steadily over time. It can be inferred that for the same period of time, the rate of increase of motor-cycles predominates over motor-cars and there are more motor-cycles accruing to the population than of motor-cars or for that matter, any other vehicle.

Table 6.3: MOTORIZATION BY VEHICLE TYPE IN PENINSULAR MALAYSIA 1970-1980

YEAR	POPULATION	MOTOR-CARS		MOTOR-CYCLES		BUSES		TAXIS	
		No.	cars/head (Per 1000)	No.	MC/head (Per 1000)	No.	Buses/head (Per 1000)	No.	Taxis/head (Per 1000)
1970	8,809,557 ¹	231,539	26.3	350,049	39.7	5,932	0.67	6,827	0.77
1975	9,918,679 ²	398,014	40.1	722,309	72.8	8,688	0.88	9,239	0.93
1976	10,156,727 ²	436,939	43.0	830,834	81.8	9,735	0.96	10,432	1.03
1977	10,400,488 ²	491,933	47.3	951,080	91.4	10,545	1.01	11,285	1.09
1978	10,650,100 ²	555,358	52.1	1,079,020	101.3	11,589	1.09	12,051	1.13
1979	10,905,702 ²	595,600	54.6	1,183,391	108.5	12,094	1.11	12,034	1.10
1980	11,138,227 ³	714,742	64.2	1,391,899	125.0	13,079	1.17	14,347	1.29

Sources: (1) Department of Statistics, 'Population Census 1970'

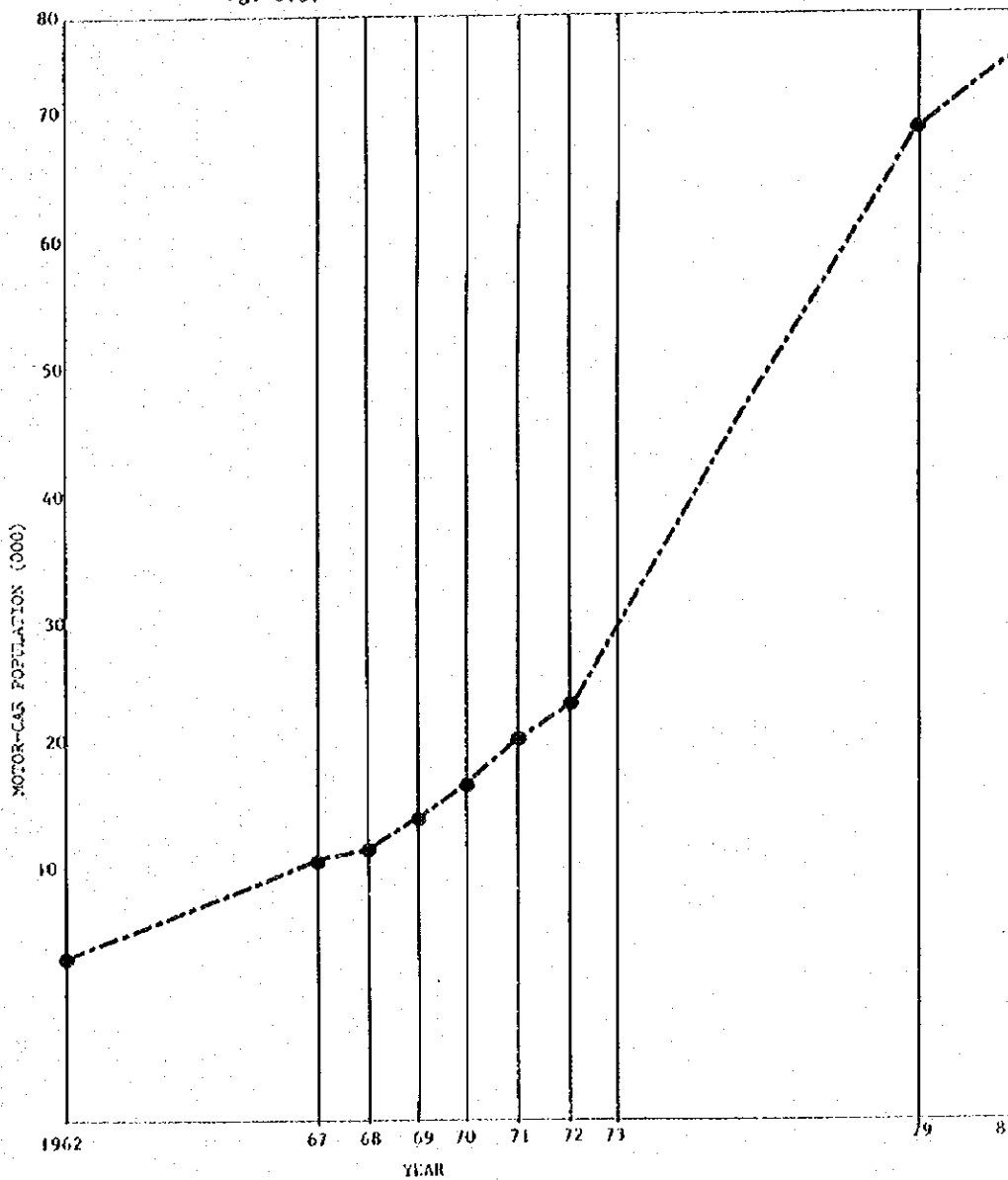
(2) Based on 2.4% average annual growth rate from 1970-80 (FME)

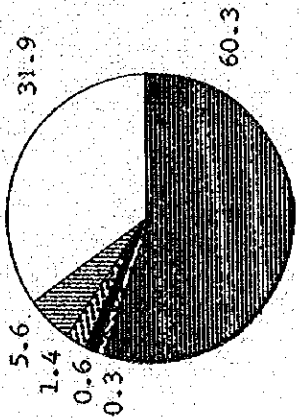
(3) Op. Cit, 'Preliminary Fieldcount Summary of 1980 Census'.

6.3.3 Motorization and Vehicle Ownership in Johor State

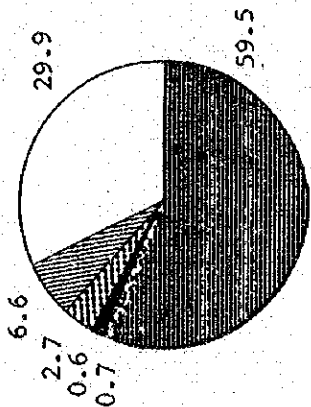
The number of private cars in the Johor State has grown from 13,000 in 1962 to 27,376 in 1970 at an average annual rate of 9.8% and at an average growth of 15.7% per annum between 1970-1980. In fact, the average growth of private cars was 9.9% per annum from 1962 to 1972 and increases to an average growth rate of 13.0% per annum from 1973 to 1979. (See Table Fig.6.3).

Fig. 6.3: PRIVATE MOTOR-CAR POPULATION IN JOHOR STATE 1962-79 (CUMULATIVE)

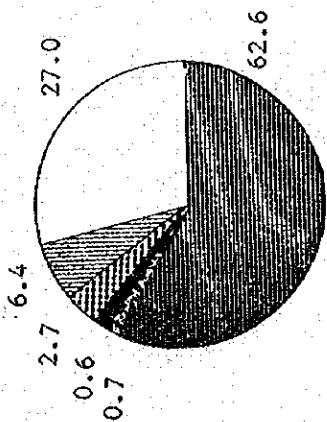




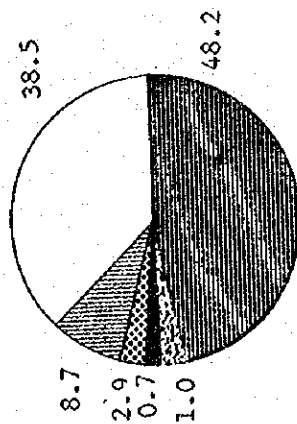
PENANG



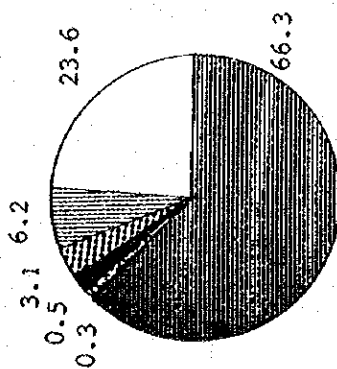
PENINSULAR MALAYSIA



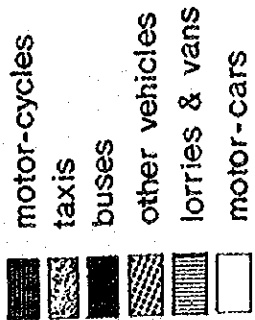
JOHOR



SELANGOR



PAHANG



NOTE: FIGURE IN PERCENTAGE

fig 6.4: composition of motor-vehicles 1979

In 1979, Johor State ranked third after Selangor and Perak in having the most number of motor vehicles (See Table 6.5).

The analysis of the composition of motor vehicles in the State of Johor showed that out of a total of 305,330 vehicles in 1979, 62.6% are motor-cycles, 27% motor-cars, 6.4% lorries, 0.6% buses and 0.7% taxis. In comparison to Peninsular Malaysia, motorcycles in the Johor State constitutes a greater proportion than that in Peninsular Malaysia; however, the reverse is true in terms of motor-cars (See Fig. 6.4). Comparison across the states showed that apart from Pahang, the State of Johor has one of the highest proportion of motorcycles but much lesser proportion of cars as compared to Penang and Selangor (See Table 6.5).

In terms of motorization, it has also been increasing rapidly from 12.2 cars per 1000 population in 1962 to a figure of 52.5 by 1979 (See Fig. 6.5).

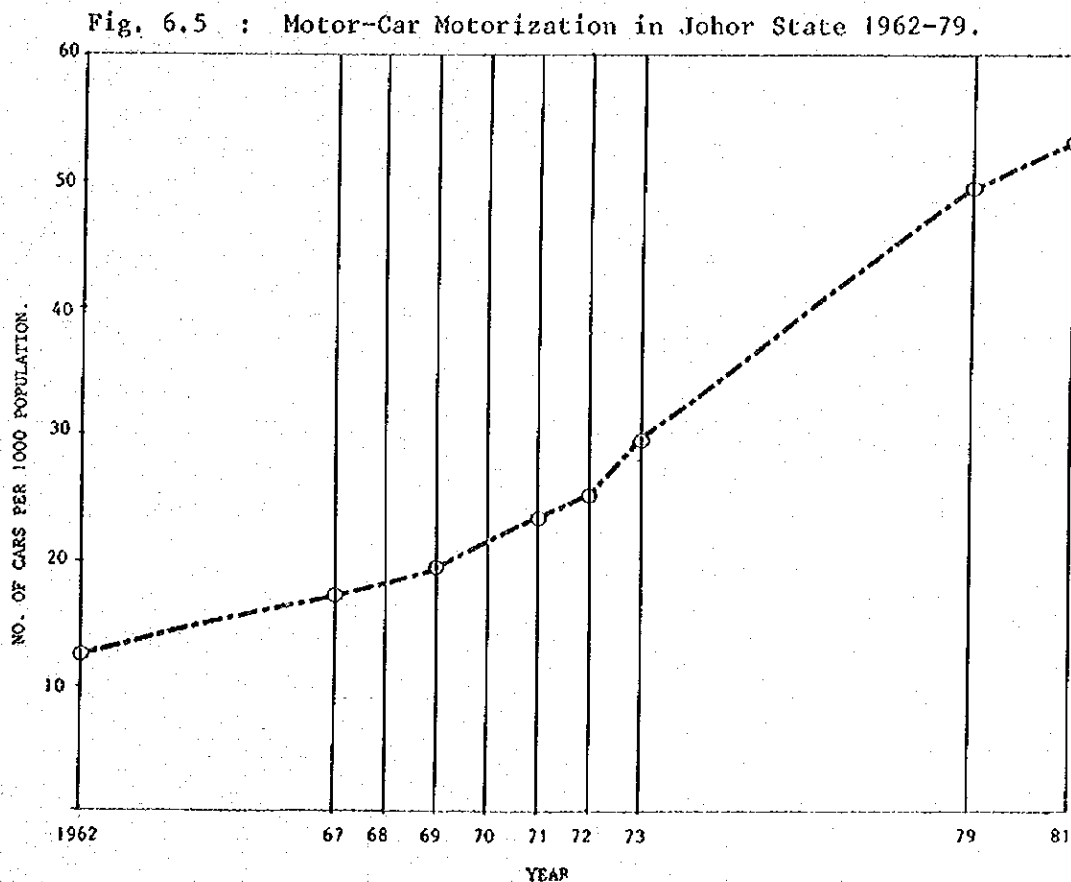


Table 6.4: Motor Vehicle by Type Registered in Johor State 1963 - 81

Year	Motor Cycles	Motor Cars	Buses	Taxis	Lorries & Vans	Other Motor Vehicles	Total	Av. Annual Growth Rate %
1962	-	13,000	-	-	-	-	-	-
1963	12,758	14,024	432	1,246	6,233	2,349	37,042	16.9
1964	16,418	15,770	479	1,287	6,744	2,616	43,314	12.8
1965	19,875	17,268	499	1,291	7,136	2,798	48,867	17.4
1966	25,784	19,350	520	1,291	7,461	2,952	57,358	12.0
1967	30,478	21,036	553	1,359	7,729	3,087	64,242	7.9
1968	33,858	22,134	684	1,502	7,925	3,202	69,305	13.0
1969	39,739	24,544	822	1,544	8,213	3,456	78,318	12.3
1970	45,265	27,376	969	1,587	8,897	3,874	87,968	12.5
1971	51,528	30,738	1,115	1,622	9,552	4,426	98,981	10.4
1972	57,934	34,037	1,173	1,638	9,838	4,652	109,272	18.1
1973	71,016	39,514	1,244	1,652	10,575	5,073	129,074	19.7
1974	89,392	44,588	1,336	1,788	11,873	5,506	154,483	13.6
1975	104,340	48,805	1,434	1,862	13,083	5,938	175,462	14.2
1976	121,788	54,269	1,575	1,943	14,414	6,340	200,329	16.1
1977	142,621	63,263	1,692	1,978	16,264	6,769	232,587	15.1
1978	166,720	72,301	1,806	2,072	17,643	7,249	267,791	14.0
1979	191,154	82,319	1,948	2,117	19,520	8,272	305,330	31.8
1980	246,566	117,581	2,048	2,273	24,034	9,798	402,300	6.9
1981*	264,812	124,670	2,115	2,554	25,291	10,448	429,890	

Notes: (1) Vehicle figures given are cumulative total from previous years.

(2) The figures for hired cars, "hire and drive" cars are included under taxis.

(3) The vehicle types included are tractors, rollers, trailers, etc.

* As at 31st. July, 1981.

Table. 6.5: MOTOR VEHICLE BY TYPE AND BY STATE REGISTERED IN PENINSULAR MALAYSIA, AS ON 31ST DECEMBER, 1979

State	Motor Cycle	Motor Cars	Taxis and Hired Cars	Hire and Drive Cars	Buses	Lorries and Vans	Trailers Others Tractors Rolles, etc.	Total
Selangor	255,056	203,327	4,712	374	3,552	46,203	15,500	528,724
Perak	199,652	82,425	1,111	29	1,249	17,459	10,605	312,530
Pulau Pinang	129,885	68,661	487	31	1,132	12,071	2,976	215,243
Johor	191,154	82,319	2,092	25	1,948	19,520	8,272	305,330
Kedah	99,418	32,081	752	-	1,359	7,818	3,829	145,257
Perlis	16,307	4,528	129	-	113	981	622	22,680
Negeri Sembilan	75,461	34,663	633	-	726	6,843	2,849	121,175
Melaka	52,534	26,946	519	-	625	5,160	1,717	87,501
Pahang	81,547	29,056	382	6	601	7,634	3,733	122,959
Kelantan	53,784	20,736	918	-	508	4,784	2,076	82,802
Trengganu	28,593	10,858	299	-	281	3,254	1,905	45,190
Total	1,183,391	595,700	12,034	465	12,094	131,723	54,084	1,989,391

NOTES:

1. The number of vehicles given against the states and vehicle types are cumulative totals from the previous years.

Source: Road Transport Department, Ministry of Transport, Kuala Lumpur.

6.3.4 Motorization by Areas in Johor Bahru

Car Motorization by areas in 1970 showed that in Johor Bahru, only 25 per cent of households owned a car. In the South Johor region, only 13 percent of households have a car available (see Table 6.6).

Table 6.6 : Motor-car Motorization by Areas

Region	Total Number of cars		Motorization				No. of Cars per Household in 1970 ²				
	1970	1979	Cars/Household Cars/1000 Pop.		1979		in 1970 ²				
			1970	1979	1970	1979	0	1	2	3	4+
Johor Bahru (% of total)	5,490	n.a.	0.26	n.a.	36.4	n.a.	15,940 (75)	4,631 (22)	564 (3)	69	32
South Johor Region (% of total)	8,500 ²	n.a.	0.12	n.a.	20.3	n.a.	53,653 (87)	6,958 (12)	786 (1)	106	64
Study Area	n.a.	35,570	n.a.	0.31	n.a.	59.4					
Johor State	26,741	82,319	0.12	0.29	20.9	52.5					
Peninsular Malaysia	231,539	595,600	0.14	0.28	26.3	54.6					

Sources: (1) RIMV, Johor Bahru and Road Transport Department, Kuala Lumpur.
(2) South Johor Regional and Development Study Estimates.

In terms of motorization, the number of cars per household in the South Johor region in 1970 was 0.12 and 20.3 cars per thousand population. Comparatively, Johor Bahru with an ownership record of 5,490 motor-cars in 1970, has higher motorization levels than South Johor region with 0.26 cars per household and a corresponding figure of 36.4 cars per thousand population. Indeed, the higher motorization levels in Johor Bahru relative to the South Johor region, the State or even Peninsular Malaysia could be viewed within the perspective of the rapid rate of urbanisation and growth of Johor Bahru as a regional hub for economic, social and commercial activities. The growth and demand for motor-cars relative to the growth in population in Johor Bahru has outstripped that in the case of the state or Peninsular Malaysia. However, the car ownership in terms of cars per household in Johor Bahru was 0.3 in 1973 (see Appendix D for vehicle composition) and this is much lower compared to large urban areas like Petaling Jaya where the corresponding figure was 0.76.

6.3.5 Vehicle Registration in Study Area

The number of motor-vehicles registered in the Study Area is as depicted in Table 6.7. The vehicle population in the Study Area constituted approximately 27 percent of the total vehicles registered in the State (as at mid-1981).

There are comparatively much more vehicles in the Primary than the Secondary Area. Vehicle registration in 1980 by mukims and zonal bases are as shown in Table 6.8..

Table 6.7 : Vehicle Registration in the Study Area, 1981
(as at May, 1981)

Type	No of Vehicle Registration			No. of vehicles registered in other areas	No. of vehicles registered in J.B. RIMV
	Primary	Secondary	Total Study Area		
Motor vehicles ¹	42,441	6,895	49,336	13,720	63,056
Motor-cycles	44,289	23,877	68,166	32,131	100,297
Total	86,730	30,772	117,502	45,851	163,353

Notes : (1) Excludes motor-cycles.

Source : Road Transport Department, Johor Bahru, 1981.

Table 6.8: Vehicle Registration, Study Area by Zones, Study Area, 1981
(As At May, 1981).

District	Mukim	Traffic Zones	Cars	Motor-Cycles	Goods Vehicle	Total
J O H O R	B A H R U	111	924	378	238	1,540
		112	154	70	63	287
		113	518	497	238	1,253
		114	847	350	245	1,442
		121	798	525	98	1,421
		122	357	161	28	546
		123	1,232	679	217	2,128
		211	70	63	7	140
		212	231	196	0	427
		213	259	238	35	532
		221	686	322	14	1,022
		223	259	245	14	518
		224	63	28	0	91
		225	112	63	0	175
		231	420	189	28	637
		232	847	434	287	1,568
		241	1,099	749	161	2,009
		242	2,492	1,134	455	4,081
		243	1,057	287	84	1,428
		251	371	287	63	721
		252	770	392	56	1,218
		261	518	238	35	791
		262	1,841	539	189	2,569
		263	637	91	77	805
		264	7	0	0	7
		265	1,134	301	56	1,491
		271	1,085	742	119	1,946
		272	392	252	42	686
		281	329	350	14	693
		311	616	672	224	1,512
		312	21	21	0	42
		313	168	203	7	378
314	966	854	154	1,974		
315	1,680	1,106	189	2,975		
321	637	756	119	1,512		
322	315	294	49	658		

District	Mukim	Traffic Zones	Cars	Motor-Cycles	Goods Vehicle	Total	
JOHOR BAHRU		323	742	889	119	1,750	
		324	315	448	49	812	
		325	259	203	7	469	
		331	679	392	35	1,106	
		332	308	1,554	35	1,897	
		333	301	462	49	812	
		341	651	959	84	1,694	
		342	609	875	35	1,519	
		351	378	364	70	812	
		352	189	329	28	546	
		353	0	0	0	0	
		354	0	0	0	0	
			Total	28,840	20,524	4,165	53,529
JOHOR BAHRU	Kulai/ Senai	421	1,071	1,883	238	3,192	
		422	1,813	3,815	420	6,048	
		423	147	742	7	896	
		424	490	1,295	63	1,848	
				3,521	7,735	728	11,984
	Pelentong	361	189	329	28	546	
		361A	-	-	-	-	
		362	385	1,050	91	1,526	
		363	119	252	49	420	
		364	63	189	7	259	
		371	175	623	7	805	
		372	805	1,876	182	2,863	
		373	14	77	7	98	
		374	77	504	28	609	
				1,827	4,900	399	7,126
	Jeluntong/ Pulai	412	224	1,267	56	1,547	
		413	182	392	28	602	
414		378	1,043	84	1,505		
			784	2,702	168	3,654	

District	Mukim	Traffic Zones	Cars	Motor-Cycles	Goods Vehicle	Total
JOHOR BAHRU	Sedenak	431	238	1,449	56	1,743
		432	91	273	14	378
	Tebrau		329	1,722	70	2,121
		441	203	385	42	630
		442	7	49	7	63
		443	140	98	21	259
	Sg. Tiram	444	84	357	7	448
			434	889	77	1,400
		461	28	259	7	294
	(A)	Tg. Kupang	462	7	63	0
			35	322	7	364
KOTA TINGGI	Tg. Kupang	411	7	84	0	91
			7	84	0	91
	Kota Tinggi	452	57	719	12	788
		453	695	3,425	170	4,290
	Ulu Sg. Johor	451	104	1,267	12	1,383
		856	5,411	194	6,461	
(A)	Primary Area		36,633	44,289	5,808	86,730
KOTA TINGGI	Johor Lama Pantai Timur Pengerang Sedeli Kechil Tg. Surat	521	1,934	5,285	225	7,444

District	Mukim	Traffic Zones	Cars	Motor-Cycles	Goods Vehicle	Total
PONTIAN	Ayer Masin	511	290	2,462	33	2,785
	Serkat					
	Sg. Karang	512	2,377	11,569	569	14,515
	Api-Api					
	Jeram Batu					
	Pengkalan Raja	513	1,208	4,561	259	6,028
	Pontian					
Rimba Terjun						
Ayer Baloi						
Benut						
			3,875	18,592	861	23,328
(B)	Secondary Area		5,809	23,877	1,086	30,772
	Total Study Area		42,629	68,166	6,924	117,502

6.4 Projection of Motor Vehicle

6.4.1 Projection Methodology

Fig. 6.6 represents the flowchart methodology used for predicting the growth of future vehicles. Essentially, there are two approaches viz. by past trend growth and the incorporation of household income determinants. There is indeed, a positive correlation between vehicle ownership and household income. Nevertheless, the future estimates obtained by both approaches are to be compared to each other so as to reaffirm its accuracy.

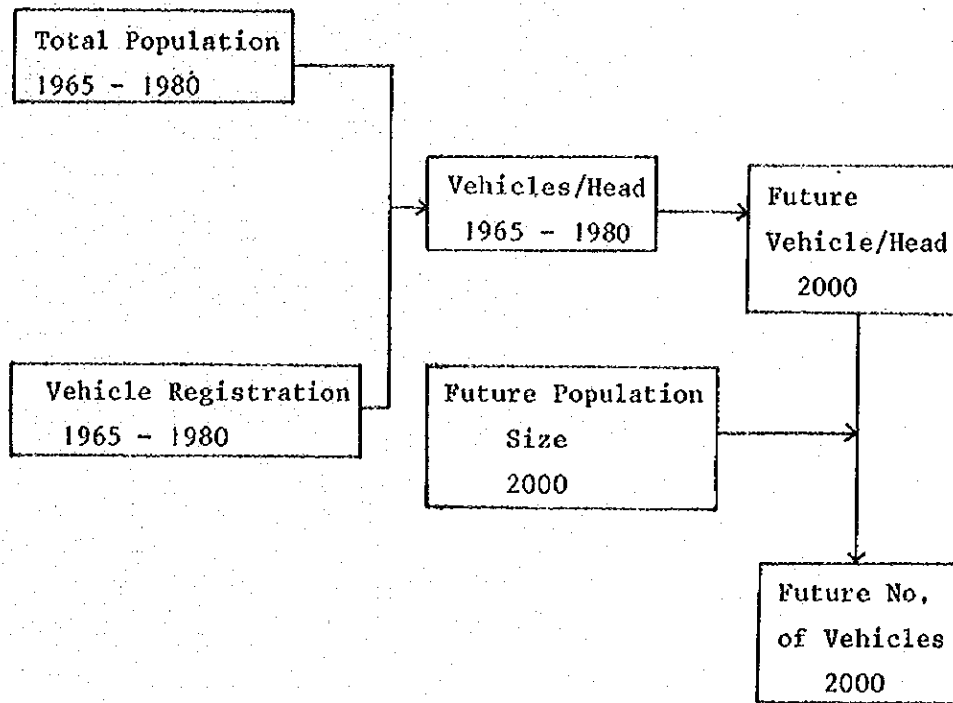


Fig. 6.6 : Projection Methodology for Future Vehicle Ownership

.4.2 Future Private Motor-car Ownership by the Compound Growth Component Method

The growth of future motor-cars in Peninsular Malaysia and Johor State are projected as shown in Table 6.9. By assuming 3 growth scenarios (basing on past trends), the likely vehicle population per head are established. With future population estimates, the total motor-car population can be determined.

As seen, the car population in Peninsular Malaysia is projected to grow from 714,742 cars in 1980 to 2,003,474 in 1990 and reaching 5,368,568 in 2000. (Medium estimates). In the Johor State, cars are anticipated to increase from 117,581 in 1980 to 318,318 in 1990 and finally to 820,020 in 2000 (Medium estimates).

Table 6.9: PROJECTED CAR-OWNERSHIP BY TREND GROWTH

CARS/HEAD 1980	AVERAGE ANNUAL GROWTH %	CARS/HEAD			TOTAL NO. OF CARS		
		1985	1990	2000	1985	1990	2000
0.064	10.1 ¹ 8.5 ² 4.8 ³	0.104 0.096 0.081	0.168 0.144 0.102	0.440 0.326 0.163	1,304,160 1,203,840 1,015,740	2,337,384 2,003,472 1,419,126	7,245,920 5,368,568 2,684,284
0.073	11.0 ⁴ 8.1 ⁵ 5.3 ⁶	0.123 0.108 0.095	0.207 0.159 0.123	0.588 0.346 0.206	222,999 195,804 172,235	414,414 318,318 246,246	1,393,560 820,020 488,220

Note: 1. Maximum average annual growth rate between 1970-79

2. Average annual growth rate from 1970-79 (Median rate)

3. Minimum average annual growth rate between 1970-79

4. Maximum average annual growth rate between 1962-79

5. Medium average annual growth rate from 1962-79

6. Minimum average annual growth rate between 1962-79.

APPENDIX

APPENDIX A

Calculation of Rubber-Processing Employment (1980 - 2000)

Peninsular Malaysia :

Employment ratio = 1 worker : 108,386 lb. input

Selangor :

Productivity . Estates = 3,029 lbs./ha.

. Smallholdings = 2,043 lbs./ha.

Rubber-processing employment (1980 - 2000)

	1980		1990		2000	
	Estate	Small-holding	Estate	Small-holding	Estate	Small-holding
Total area under rubber (Ha.)	73,993	45,613	71,041	45,613	65,701	45,613
(Ha.)						
Total area tapped (75% assumption)	55,495	34,210	53,281	34,210	49,276	34,210
Total production (million lbs.)	168.1	69.9	161.4	69.9	149.3	69.9
Total employment	1,550	645	1,490	645	1,380	645
	2,195		2,135		2,025	

APPENDIX B

Calculation of Oil Palm-processing Employment (1980 - 2000)

Johor (1980)

Total production = 3,522,904 FFB tons

Tapped area = 203,671 ha.

. Productivity = 17 tons per ha.

No. of mills = 32

Total input = 3,522,904 tons

Production capacity of 1 mill = 110,090 tons

= 85 wokers*

Hence, 1 worker = 1,295 tons input

Source : Survey of Manufacturing Industries, Dept. of Statistics, 1974

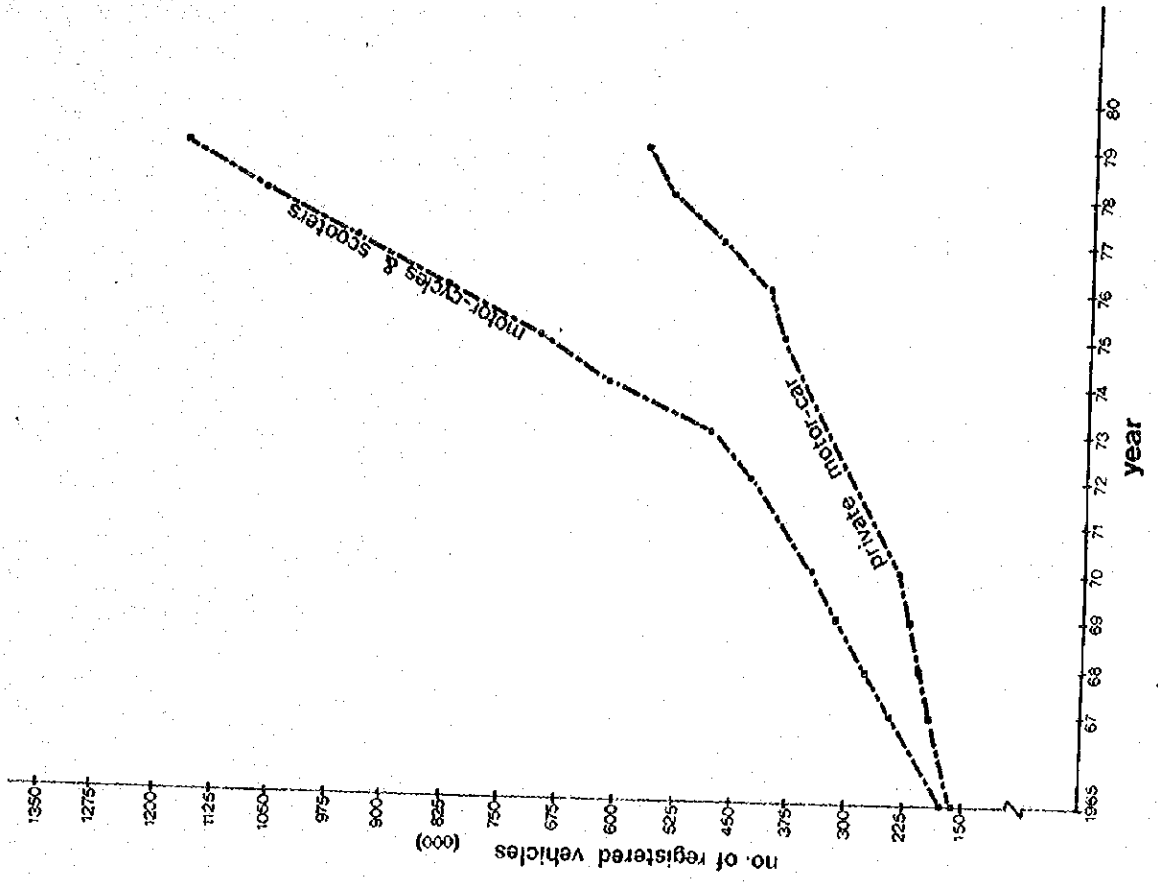
Study Area

Oil Palm-processing Employment (1980 - 2000)

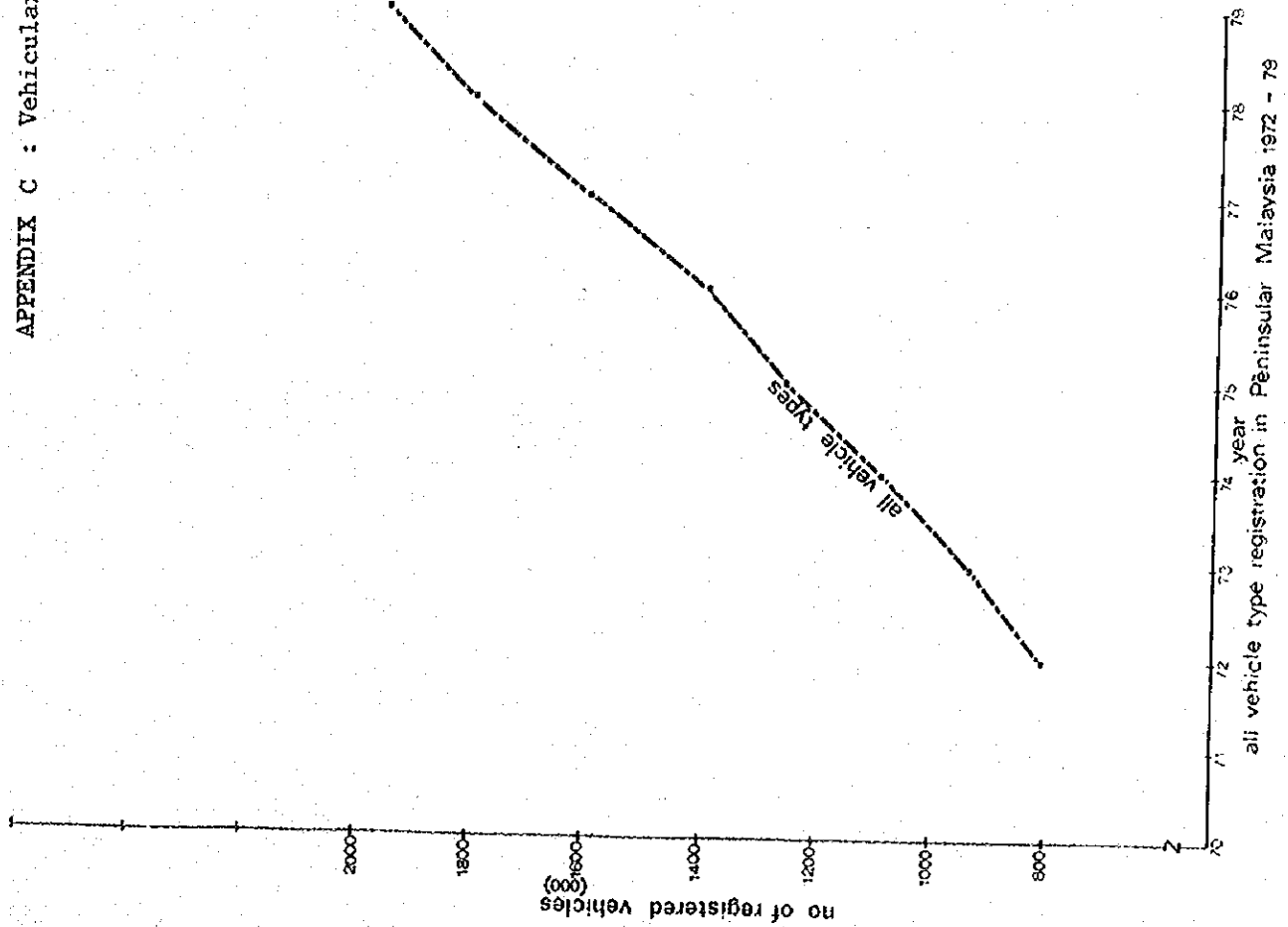
	1980	1990	2000
Total area under oil palm (ha.)	112,815	124,815	no change
Total area tapped (assuming 75%) (ha.)	84,611	93,611	
Total production (1000 FFB tons)	1,438.4	1,591.4	
Total employment	1,110	1,230	

Source : Study Team Estimates (1981).

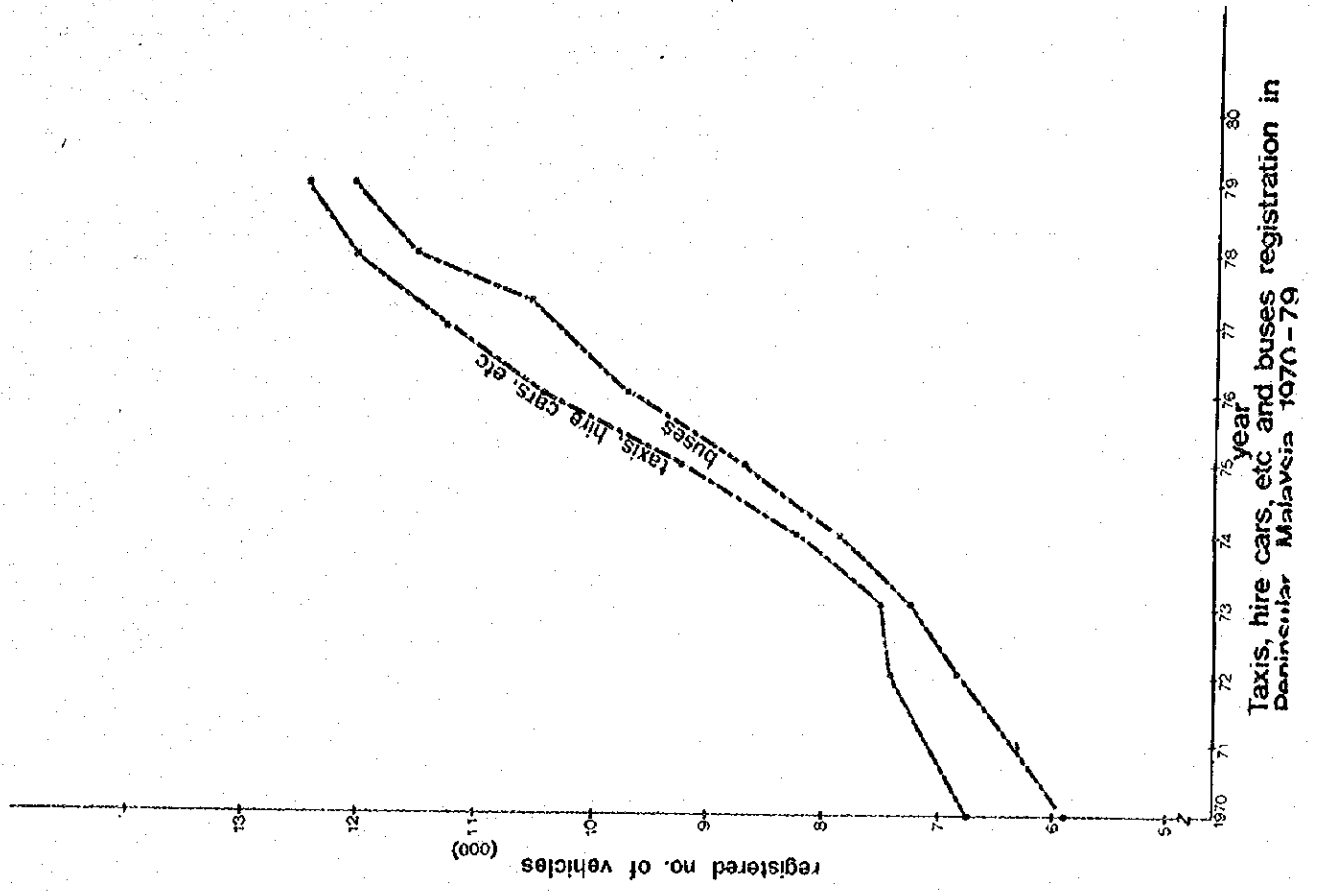
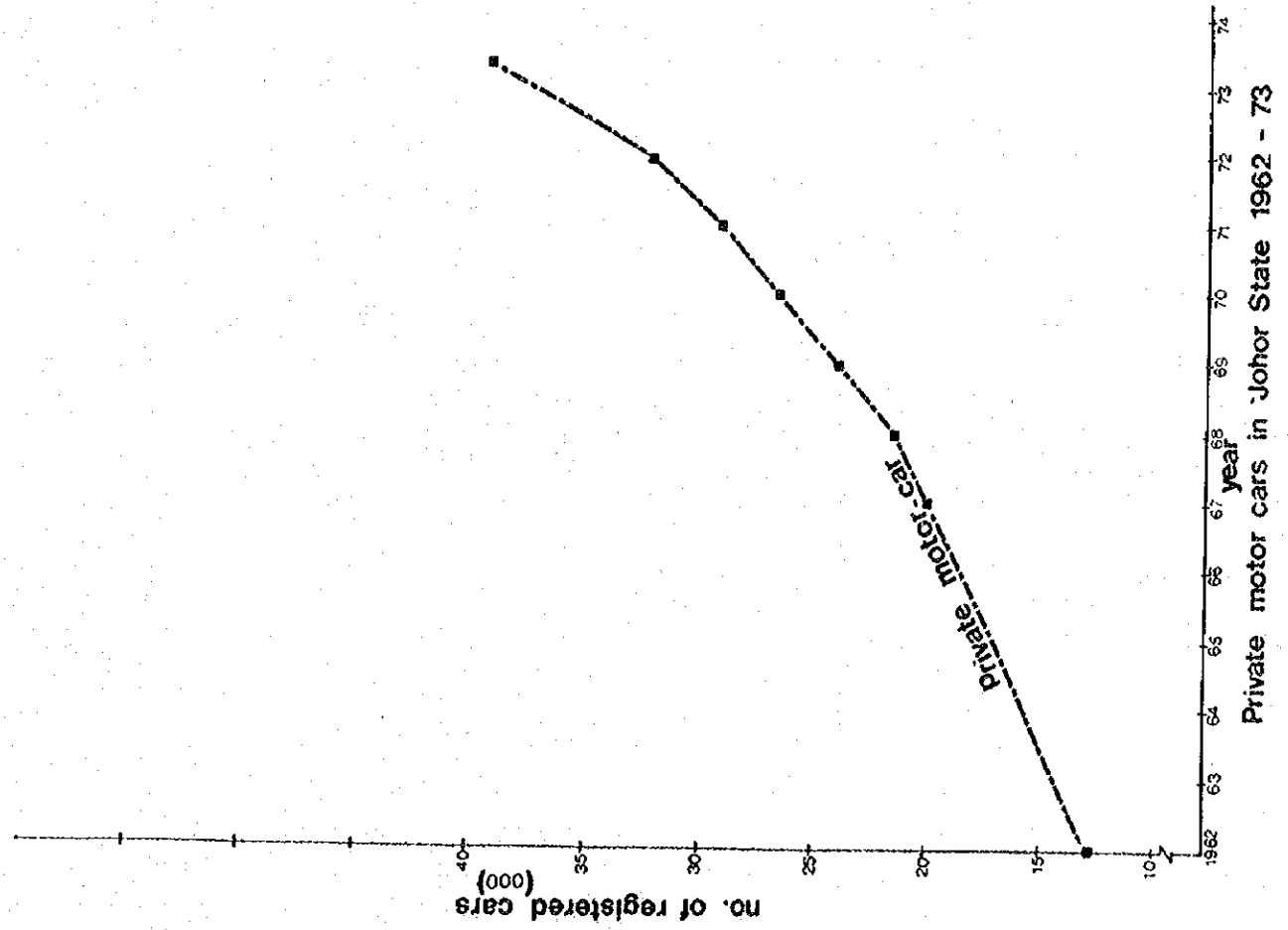
APPENDIX C : Vehicular Trends in Peninsular Malaysia and Johor State



Private motor-car and motor-cycle ownership in Peninsular Malaysia 1965 - 79



all vehicle type registration in Peninsular Malaysia 1972 - 79



APPENDIX D

Vehicle Composition in Johor Bahru 1973

Vehicle Type	Number
Motor Cars	7,574
Motor Cycles	3,928
Lorries	1,756
Others	171
Total	13,429

Source: RIMV, Johor Bahru.

