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

## TECHNICAL REPORT 6 LAND USE STUDY

MARCH 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

GOVERNMENT OF MALAYSIA

TECHNICAL REPORT 6 LAND USE STUDY

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# 1.0 THE STUDY FRAMEWORK

## 1.1 Introduction

In response to the request made by the Government of Malaysia for technical cooperation in conducting an Urban Transport Master Plan Study for the Johor Bahru Conurbation (hereinafter referred to as "the Study"), the government of Japan, through the Japan International Cooperation Agency (JICA) sent a Study Team to carry out the Study jointly with the government of Malaysia.

The Study commenced on 21st. May, 1981 when the Steering Committee Meeting was held and accepted the Inception Report for the Study.

The objective of the Study is to formulate a transport master plan comprising of transport policies and short term improvement plan and program, as well as long term, that will effectively serve the present and future needs and complement the overall structure plan for the orderly development in the Johor Bahru Conurbation.

The Study is being carried out jointly by JICA and the government of Malaysia in close cooperation with the other related agencies.

The organization of the Study is presented below:

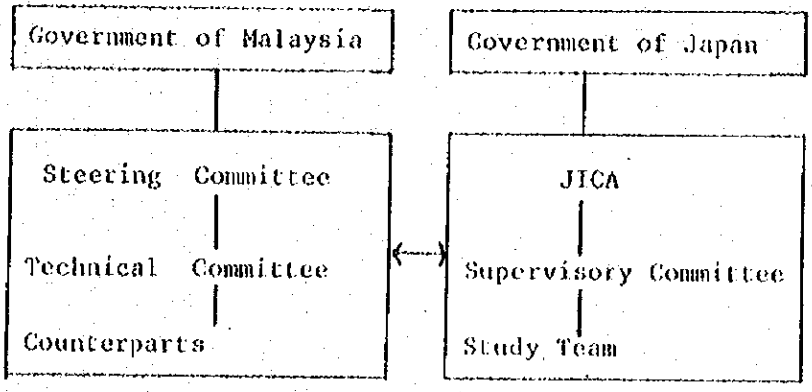



Fig 1-1 Organization Chart

In order to accomplished the objective of the Study the following components of the Study are to be conducted:

a. Preparatory Works

b. Regional Framework Planning, Land Use Planning and Environmental Consideration

c. Traffic Survey, Data Processing and Traffic Projection

d. Urban Transport Planning

e. Road Planning and Preliminary Design

f. Traffic Engineering and Management Study

g. Public Transport Improvement Planning

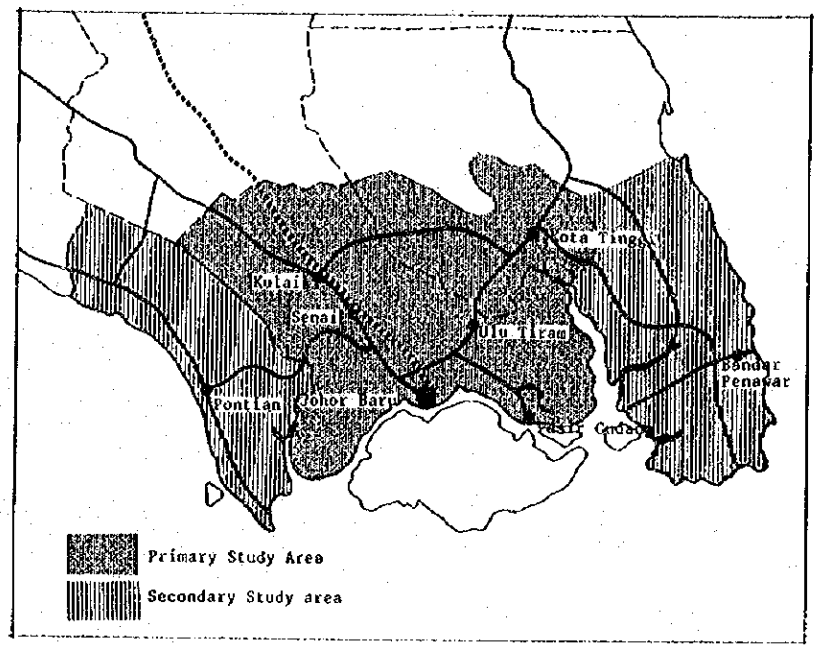
## 1.2 Purpose of the Land Use Study

Explicit within the overall study objective of formulating a master plan for the development of a comprehensive transport network and system was the need to identify a rational land use pattern. It was thus appreciated from the outset that the existing urban and regional development pattern should be examined prior to identifying the future development from which will lead to the realisation of the transport master plan.

The land use study is principally aimed at generating long-term development plan of future land use in the year 2000. The study of alternative land use plans will include land use configuration and distribution patterns in terms of residential, industrial, agricultural and business and commerce land uses besides identifying major development areas in relation to housing and industries.

## 1.3 Study Area

Fig. 1-2 The Study Area



## 1.4 Study Framework

The methodology for formulating the landuse pattern in 2000 is composed of 4 major stages :

| | | |
|---|---|---|
| Stage I | : | Analysis on the mid term urbanization pattern |
| Stage II | : | Analysis on the long term urbanization pattern |
| Stage III | : | Building basic framework of urban development pattern |
| Stage IV | : | Desirable landuse pattern |

The study framework and the methodology is as shown in Fig. 1-3.

A structural concept plan is formulated for the study area and the future landuse pattern in the metropolitan area is discussed.

Stage I is to provide preliminary conditions for projecting the year 2000. It discusses possible predictions in the year 1990.

Stage II deals with the study on the long term urbanization pattern in the light of the macro-potential of the study region, which will be formulated by studying regional future perspectives, such as development scenarios, sectoral prospects and urban hierarchy.

In Stage III and IV, it is discussed in the meso-scale potential perspectives which will be affected by the local needs and conditions of the metropolitan region such as the transport system and the linkage system with Singapore.

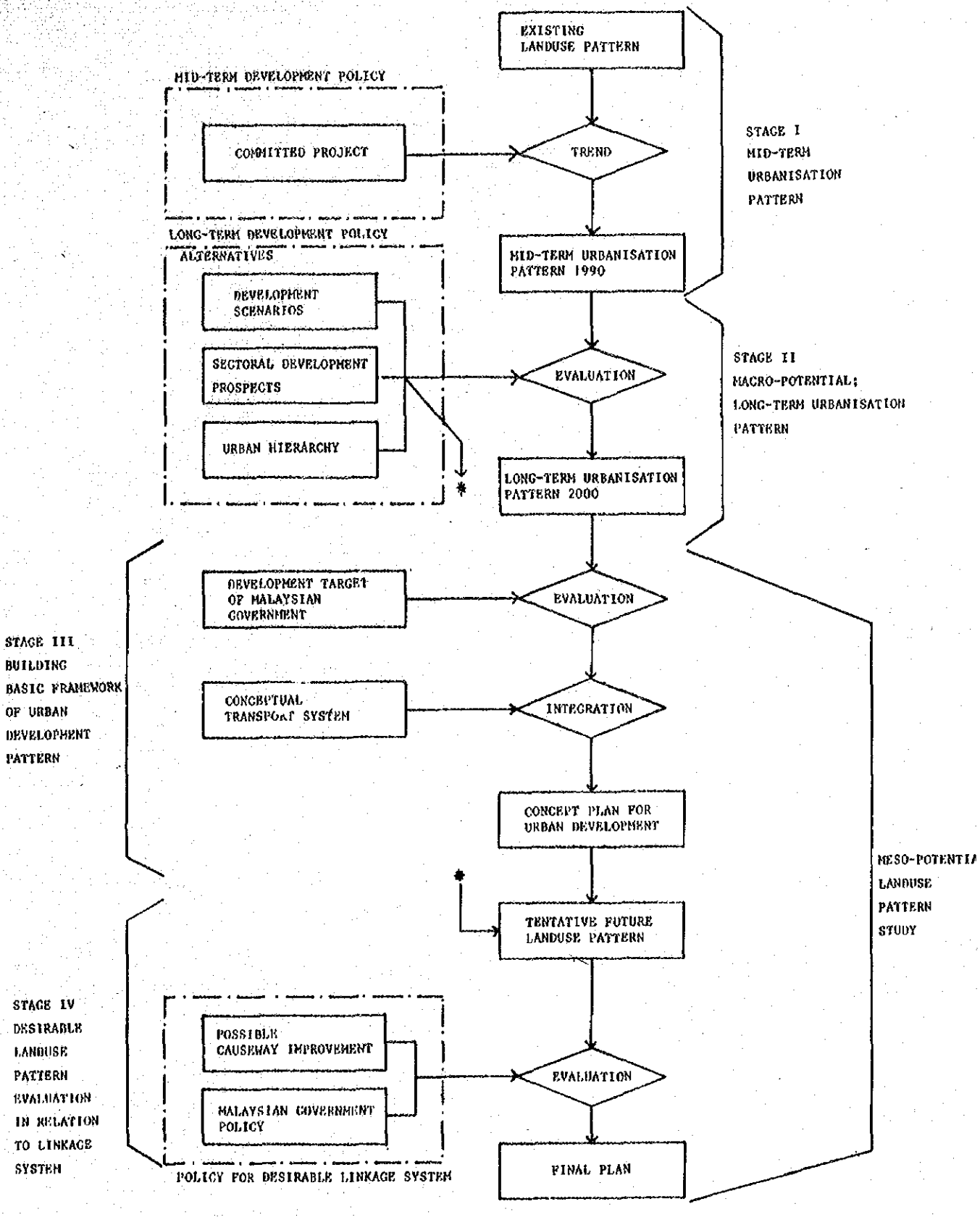



Fig.1-3 Framework of Landuse Study

## 2.0 THE PRESENT DEVELOPMENT FRAMEWORK

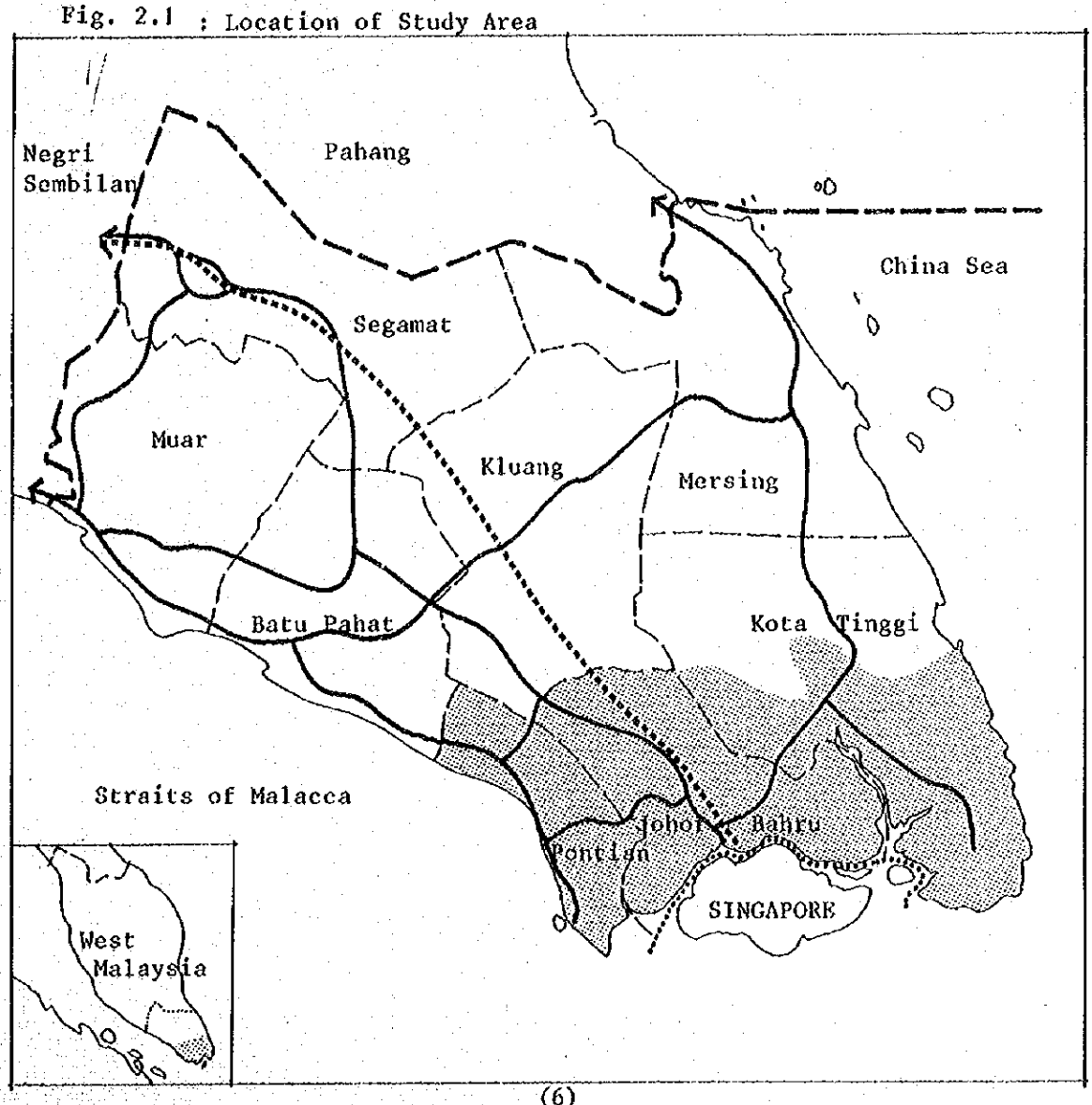
### 2.1 Background of the Study Area

#### 2.1.1 Location and Regional Setting

The Study Area covers a surface of approximately 470,759 ha. ( 1.16 million acres) or a third of the state of Johor. It includes the districts of Pontian, Johor Bahru and the part of Kota Tinggi district which makes up the Tanjong Penggerang portion of Johor Tenggara.

While major land schemes form its northern frontier, the Study Area is linked to Singapore by a causeway across the Straits of Johor. In fact, major parcels of the Study Area itself, form parts of the land schemes, namely the Johor Barat Drainage Scheme and the Johor Tenggara Development Scheme.

Fig. 2.1 : Location of Study Area



Essentially, the Study Area consists of a Primary Study Area (248,414 ha.) which is flanked on either side by the Secondary Study Area (222,345 ha.).

There were 619,590 people living in the Study Area in 1980. Of these, 74% lived in the Johor Bahru district, 20% in the Pontian district and the remaining 6% in the Kota Tinggi district area. The population in the Study Area increased at a rate of 3.4% per annum in contrast to the national rate of 2.4%.[1]

The single-most important urban area within the Study Area and one which is rapidly growing each year, is undoubtedly the Johor Bahru area. Its population in 1980 was 247,000 or 40% of the population in the Study Area. Prominant towns in the Study Area include Pontian Kecil, Kota Tinggi, Kulai, Senai, Pasir Gudang and the new township of Bandar Penawar. However, Kulai with 24,200 and Pontian Kechil with 13,940[2] are the only two towns with a populatior of more than 10,000 in 1980.

A huge gap exists between Johor Bahru and the other towns in terms of urban functions, a situation which reflects the disparities between metropolitan and rural villages and towns throughout Johor state.

Until 10 years ago, the eastern portion of the Study Area was natural forest area. Agricultural land schemes have now replaced the forests and construction work for the new township of Bandar Penawar and several other service centres dispersed throughout the agricultural schemes are now underway. They introduce a more urban way of life in this part of the region.

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1. Study Team Estimates (1981) - Population Section
2. Ibid.

### 2.1.2 Climate

Similar to the rest of the country, the Study Area has a wet equatorial climate which is altered somewhat by the effects of the monsoons. In respect of this, the eastern coast is more adversely affected because of the direct impact of the north-east Monsoon from the South China Sea.

Generally, the mean annual precipitation is about 70 inches. The highest average annual rainfall is usually recorded on the eastern portion with most of the rain falling during December and January. A more uniform distribution of rainfall is experienced on the west coast mostly during the intermonsoonal periods in the form of convectional rainfall.

Temperatures for most of the months range from 25.5°C to 27.8°C.

Relative humidity is high, being in the region of 82%.

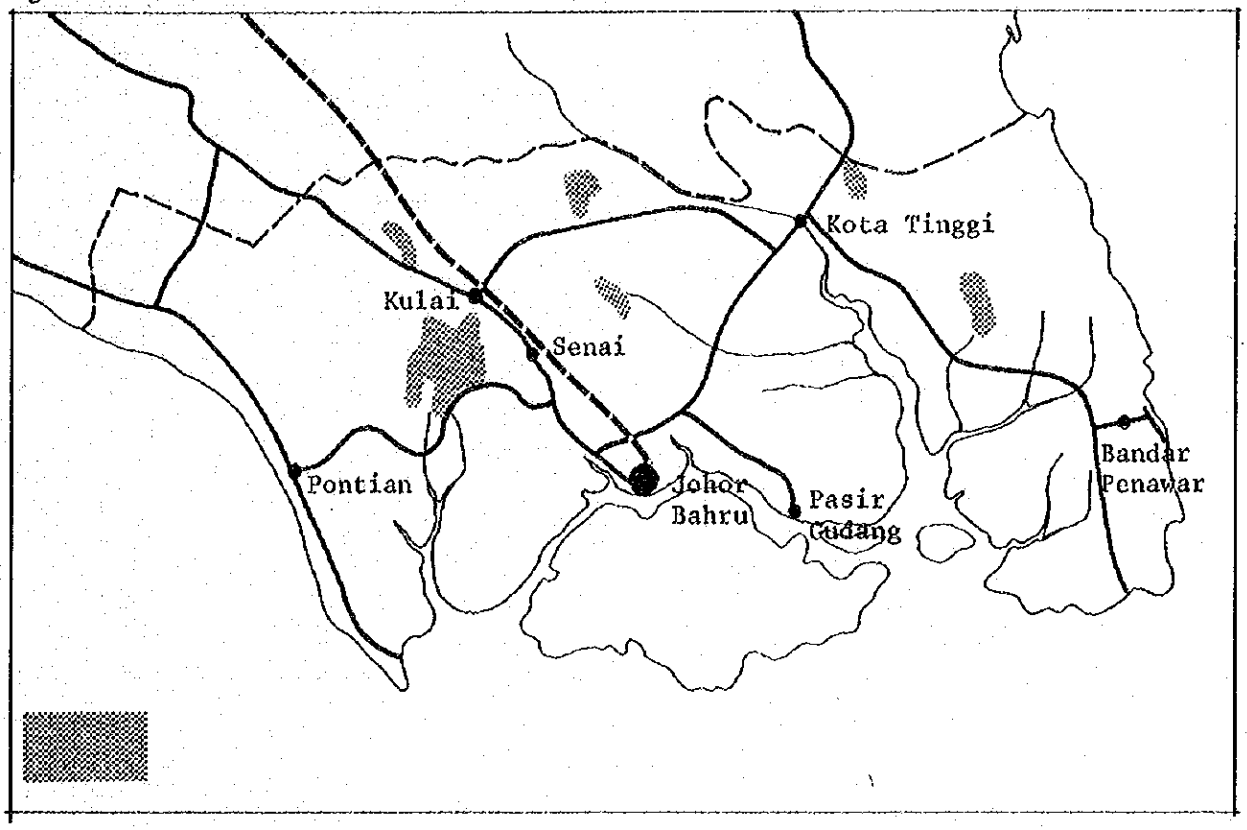
### 2.1.3 Topography

The topography within the Study Area is generally undulating. The high areas consist of isolated hills which are composed mainly of granite. The highest peak in the Study Area is Gunong Pulai. It should be noted that the Gunong Pulai Hills more or less constitute the watershed to the west coast from those draining to mark the only large area of steep topography which could inhibit agricultural development.

The coastal areas along the Straits of Malacca and the Straits of Johor as well as the banks of the various major rivers are generally low-lying and occasionally subject to tidal influence. The coastal

plains on the west particularly, are only a few feet above sea level. On low-lying areas away from the coast, peat swamps and mangrove swamps are found.

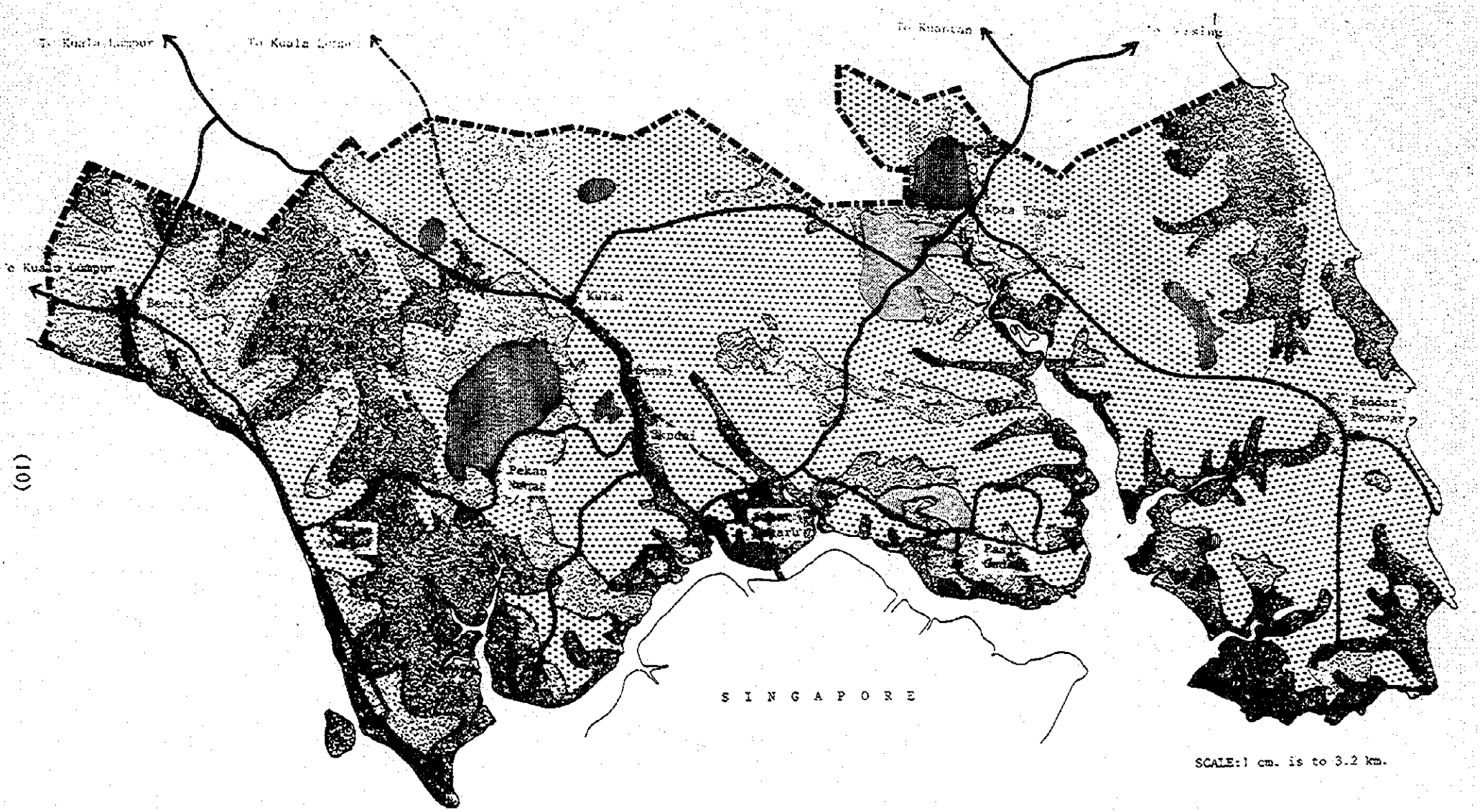
Fig. 2.2 ;PHYSIOGRAPHIC FEATURES




2.1.4 Soil conditions[3]

On the whole, the Study Area exhibits extensive areas of Class II soils with the exception of the Pontian District area where Class IV soils are extensively found. The soils in this area take the form of peat swamp, giving rise to perpetual water-logging. Nevertheless, a massive drainage scheme

3. Based on the Land Resources Map, 1976, the soils have been classified as follows:
   Class I : Soils suitable for a widest range of crops
   Class II : Soils with moderate limitations to crop growth
   Class III : Soils with one serious crop limitation
   Class IV : Soils with more than one serious crop limitation
   Class V : Soils best retained under forestry use




(01)

# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- CLASS 1- suitable for widest range of crops.
- CLASS 2- soils with moderate limitation to crop growth.
- CLASS 3- soils with one serious limitation to crop growth.
- CLASS 4- soils with more than one serious limitation to crop growth.
- CLASS 5- soils best retained under forestry use.
- Existing primary road network.

SOIL CAPABILITY

Fig. 2.3

is now underway to make the area more feasible agriculturally.

Class I soils are found in scarce deposits. Similarly, Class III and V soils are found in scattered locations. The latter coincide largely with environmental areas such as forest reserves and water catchment areas.

Generally, the areas indicating Class I, II and III soils have been alienated for agriculture, namely rubber and oil palm.

### 2.1.5 Road Network and Settlement Pattern

The Study Area is linked by road to both the east and west coast of Peninsular Malaysia. A fairly new system of rural roads now exists in the Tanjong Penggerang subregion. Major highway construction is now underway in various parts of the Study Area in an effort to accomodate increased traffic flows between major and other rural towns within the region.

The national railway line runs more or less adjacent to the existing north-south trunk road within the Study Area. Both these transportation routes converge at Johor Baru and finally form the causeway across to Singapore. Without doubt, Johor Baru is the focal point for the Study Area's transport system.

As mentioned earlier, only two towns in 1980 stand to be classified as urban[4] and they are Johor Bahru and Kulai.

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4. The Department of Statistics in the 1970 Census of Population defined as urban all gazetted towns with a population of 10,000 or more; the remaining areas are regarded as rural.

In spite of its lateral position, Johor Bahru plays a significant role in the region's development by nature of its long-established standing as the State capital and commercial and administrative centre, as well as its placing as the southern gateway to the country.

## 2.2 The Existing Land Use

### 2.2.1. Regional Land Use Pattern

The present regional land use pattern in the Study Area is predominantly agricultural. Agriculture accounts for nearly 60% of the Study Area's land use in 1980 (See Table 2.1). Rubber and oil palm are the 2 most widely cultivated crops; together they make up 82% of the cultivated land area. However, while the land area for oil palm has increased ninefold since 1966, that for rubber has been gradually declining since. In fact, the Government decision to construct the new port at Pasir Gudang was mainly in response to increasing oil palm exports. (See Appendix 2.3).

Table 2.1 : Land Use in the Study Area (1966, 74 & 80)

| | | 1966 (Ha.) | 1974 (Ha.) | 1980 (Ha.) | 1980 (%) |
|---|---|---|---|---|---|
| Non-Agricultural Use | Urban | 5,743 | 8,671 | 15,571 | 3.3 |
| | Forest/Swamp | 182,525 | 131,358 | 111,415 | 23.7 |
| | Mining | 1,144 | 2,534 | 2,534 | 0.5 |
| | Grassland, cleared land etc | 97,530 | 87,009 | 50,956 | 12.9 |
| | SUB-TOTAL | 286,942 | 229,572 | 190,476 | 40.4 |
| Agricultural Use | Rubber | 137,144 | 137,940 | 119,606 | 25.4 |
| | Oil Palm | 12,360 | 56,088 | 112,815 | 24.0 |
| | Coconut | 10,758 | 16,397 | 19,215 | 4.1 |
| | Market-gardening | 7,574 | 7,409 | 941 | 0.2 |
| | Other crops | 15,468 | 23,358 | 27,706 | 5.9 |
| | SUB-TOTAL | 183,304 | 241,192 | 280,283 | 59.6 |
| TOTAL | | 470,246 | 470,759 | 470,759 | 100 |

Sources:
1. I.F.T. Wong, Present Land Use of Peninsular Malaysia (1974 & 1966)
2. Resource Maps (1979)
3. Department of Land and Mines (1981)
4. Department of Agriculture, Annual Reports (1977, 78, 79,80)
5. South Johor Regional Study (1981)

During the 1960's, the increases in oil palm area were largely accounted for by the estate sector. But subsequently to the Second Malaysia Plan, Government agencies like FELDA, FELCRA, RISDA and KEJORA have opened up a vast number of oil palm schemes in the area, for example, in the Tanjong Penggerang area.

Other crops such as coconut, pineapple, cocoa, coffee, orchard fruits[5], spices[6], etc., make up about 10% of the land use. Pineapple is widely grown in the Pontian district; over 90% of the pineapples grown in the Study Area are found there. In fact, the Pontian district has the major share of orchard and cash crops (excluding rubber and oil palm) in the Study Area. The reasons why such crops are more favored by private smallholders is that they do not require extensive primary-processing machinery and the plants fruit throughout the year although there are distinct peak periods. Moreover, such crops can easily be intercropped with more permanent crops such as rubber and coconut.

Within the non-agricultural category, forests and swamps constitute 23% of the Study Area while grassland/ cleared land make up 12%. Urban areas,

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5. Fruits grown include durian, rambutan, dukus, chikus, cempedak, nangka, manggis, langsat, mata kucing and limes.
6. Spices cultivated comprises mainly black pepper, cloves, nutmegs.

that is, Local Council Areas, housing schemes, estate buildings, etc. occupy only 3% of total land use. Mining activity is confined to the Mukims of Pantai Timor and Kota Tinggi. The tin mines at Lombong in Pantai Timor have been operating for many years and are still productive. The mines in Kota Tinggi (south of Tanjong Penggerang) provide huge deposits of bauxite.

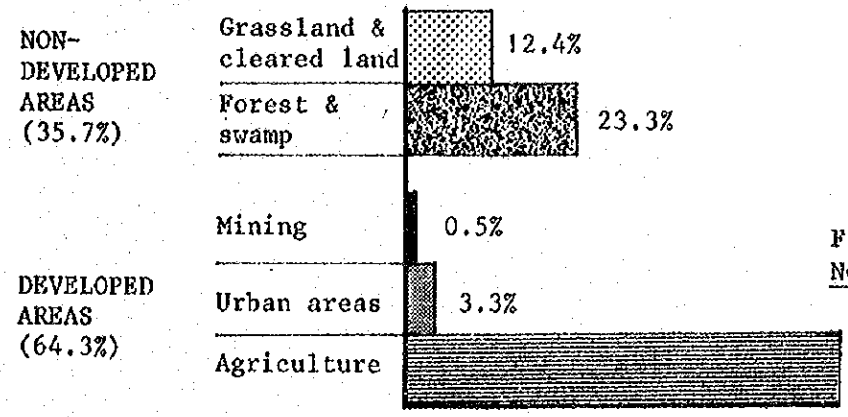



Fig. 2.4 : Developed and Non-developed Areas (1981)

It can be said that the Study Area is relatively developed in the sense that 64% of the land has been utilised for either agricultural, urban or mining development (See Table 2.2 & Fig. 2.4). This leaves a remainder of 36% (or 168,084 ha. out of 470,759 ha.) of land under forests, swamps, grassland and vacant land. It is understood that a substantial proportion of forests and swamps are environmental areas, that is, they have been gazetted as forest reserves, game reserves, aborigine reserves or water catchment reserves. The implication here is that land immediately available for agricultural development is limited, especially so in the Primary Area where about 69% of the land area has already been utilised compared to 57% in the Secondary Area.

Table 2.2 : Developed and Non-developed Land Area (1980)

| | | PRIMARY AREA(HA.) | SECONDARY AREA (HA.) | TOTAL STUDY AREA | |
|---|---|---|---|---|---|
| | | | | (Ha.) | % |
| DEVELOPED AREA | Urban development | 13,734 | 1,837 | 15,571 | 3.3 |
| | Agricultural development | 155,876 | 124,407 | 280,283 | 59.5 |
| | Mining development | 1,340 | 1,194 | 2,534 | 0.6 |
| | SUB-TOTAL | 170,950 | 127,438 | 298,388 | 63.4 |
| UNDEVE-LOPED AREA | Forest & swamp | 45,269 | 66,146 | 111,415 | 23.7 |
| | Grassland, cleared land | 32,195 | 28,761 | 60,956 | 12.9 |
| | SUB-TOTAL | 77,464 | 94,907 | 363,351 | 36.6 |
| | | 248,414 | 222,345 | 470,759 | 100 |

N.B. For more detailed breakdown of land use by Mukims, refer to Table 2.4

Thus on the whole, the western portion of the Study Area indicates a more diverse land use mainly for the reason that the farms are in the nature of private small-holdings and hence crop-type is determined by the individual owner-farmer. Moreover, a more diverse distribution of soil-types are found here, ranging from sandy coastal soils which are suitable for coconut to peaty soils which are ideal for pineapple. The western part of the Study Area shows a more uniform pattern of land use, as crop-type is determined by the two main implementing authorities, KEJORA and FELDA, who operate on an estate system.

Table 2.3 : Land Use (1980) - By Primary & Secondary Study Areas

| | NON-AGRICULTURAL | | | | | AGRICULTURAL | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | Forest /Swamp | Mining | Others | Sub-Total | Rubber | Oil Palm | Coconut | Hort. /M.G. | Other Crops | Sub-Total | |
| Primary Area Ha. | 13734 | 45269 | 1340 | 32195 | 92538 | 80598 | 61303 | 870 | 430 | 12673 | 155876 | 248414 |
| Secondary Area Ha. | 1837 | 66146 | 1194 | 28761 | 97938 | 39008 | 51512 | 18345 | 511 | 15033 | 124407 | 222345 |
| Total Study Area Ha. | 15571 | 111415 | 2534 | 60956 | 190476 | 119606 | 112815 | 19215 | 941 | 27706 | 280283 | 470759 |

Sources: 1. I.F.T. Wong, Present Land Use of Peninsular Malaysia (1966 & 1974)
2. Resource Maps (1979)
3. Department of Land and Mines Johor (1981)

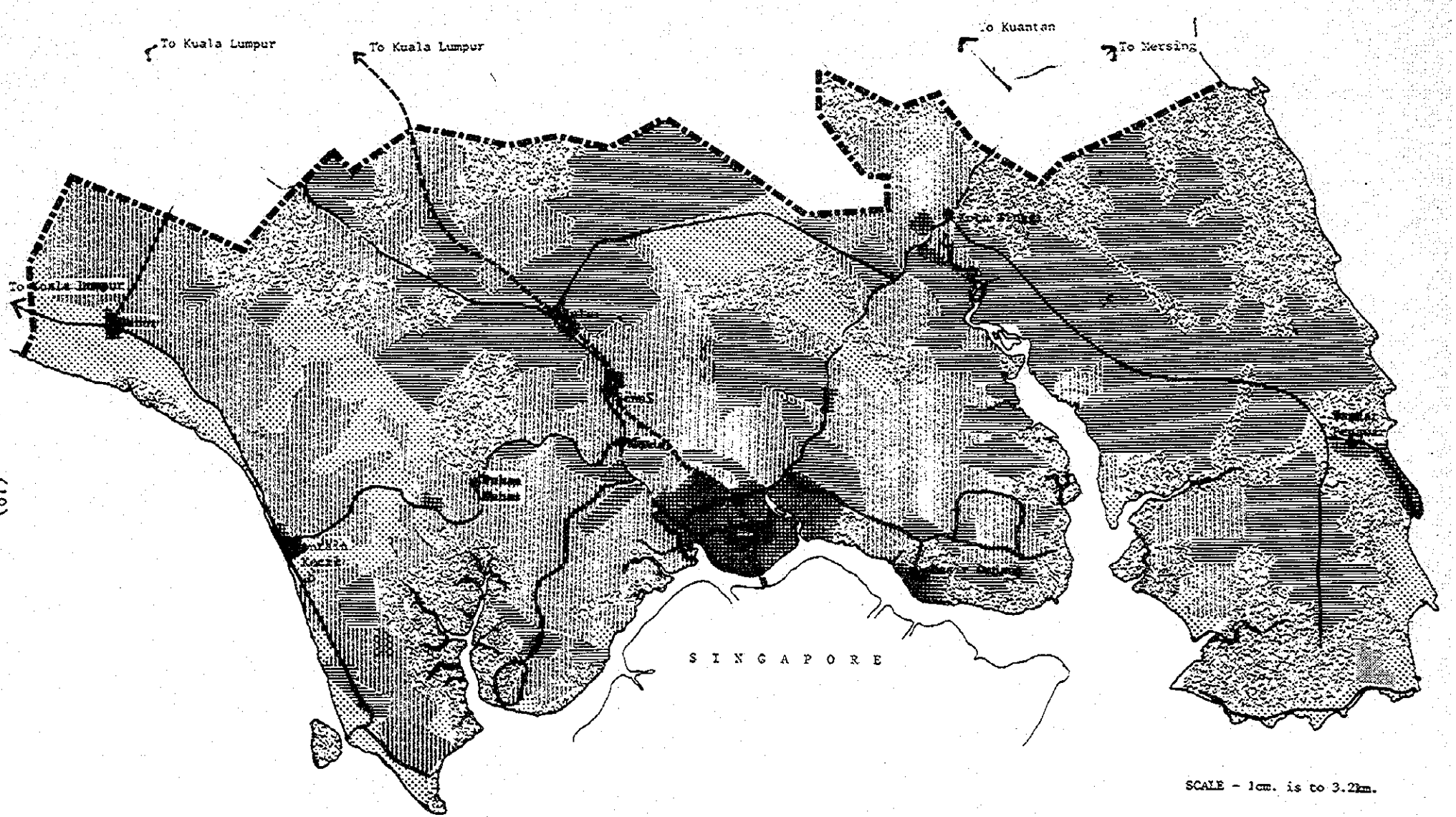
Table 2.4 REGIONAL LAND USE PATTERN (1980)

| | NON-AGICULTURAL (HA.) | | | | | AGRICULTURAL (HA.) | | | | | | TOTAL LAND USE AREA (HA.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | URBAN | FOREST /SWAMP | MINING | OTHERS+ | SUB-TOTAL | RUBBER | OIL PALM | COCONUT | HORT. /MART-GARDS | OTHER CROPS | SUB-TOTAL | |
| MPJB/J.B. Mukim* | 7,502 | - | - | 4,438 | 11,940 | - | - | - | - | - | - | 11,940 |
| Tanjong Kupang | 19 | 3,467 | - | 1,324 | 4,810 | 1,423 | 1,313 | 490 | - | 88 | 3,314 | 8,124 |
| Pulai Jelutong | 529 | 2,060 | - | 941 | 3,530 | 11,578 | 4,903 | 180 | 135 | 883 | 17,679 | 21,209 |
| Teberau | 724 | 61 | 3 | 657 | 1,445 | 8,752 | 7,354 | - | - | - | 16,106 | 17,551 |
| Pelentong | 2,796 | 290 | 40 | 273 | 3,399 | 15,122 | 1,761 | - | - | - | 16,883 | 20,282 |
| Sg. Tiram | 102 | 6,532 | 19 | 3,520 | 10,173 | 8,916 | 4,704 | 166 | 11 | 293 | 14,090 | 24,263 |
| Senai - Kulai | 1,117 | 7,304 | 28 | 4,033 | 12,482 | 11,892 | 18,210 | - | - | 691 | 30,793 | 43,275 |
| Sedenak | 453 | 10,865 | - | 5,411 | 16,729 | 11,371 | 2,079 | 34 | - | 1,384 | 14,868 | 31,597 |
| JOHOR BAHRU DISTRICT | 13,242 | 30,579 | 90 | 20,597 | 64,508 | 69,054 | 40,324 | 870 | 146 | 3,339 | 113,733 | 178,241 |
| Benut | 25 | 1,472 | - | 144 | 1,641 | 5,171 | 31 | 5,842 | - | 1,750 | 12,794 | 14,435 |
| Sg. Pinggan | 44 | 606 | - | 1,643 | 2,293 | 2,834 | 11 | 1,218 | - | 817 | 4,880 | 7,173 |
| Ayer Baloi | 5 | 5,518 | - | 2,767 | 8,290 | 4,045 | 17 | 1,625 | - | 994 | 6,681 | 14,971 |
| Api-Api | 37 | 589 | - | | 626 | 2,697 | 56 | 2,992 | - | 2,433 | 8,178 | 8,804 |
| Pontian | 167 | 717 | - | 1,397 | 2,281 | 4,654 | 1,078 | 929 | 165 | 3,664 | 10,490 | 12,771 |
| Pengkalan Raja | - | 64 | 26 | 200 | 290 | 460 | - | - | - | 354 | 814 | 1,104 |
| Rimba Terjun | 106 | 1,212 | - | 2,702 | 4,020 | 1,669 | 956 | 1,406 | - | 1,271 | 5,302 | 9,322 |
| Sg. Karang | - | 3,278 | - | 875 | 4,153 | 1,385 | - | 426 | - | 594 | 2,405 | 6,558 |
| Ayer Masin | 25 | 431 | - | 1,025 | 1,481 | 406 | 1,033 | 156 | - | 641 | 2,236 | 3,717 |
| Jeram Batu | 237 | 2,572 | 44 | 1,415 | 4,268 | 4,978 | 85 | 655 | - | 1,280 | 6,998 | 11,266 |
| Serkat | 19 | 2,121 | - | 676 | 2,816 | 1,378 | - | 1,606 | - | 274 | 3,258 | 6,074 |
| Pulau Kukup | - | 634 | - | 274 | 908 | - | - | - | - | - | - | 908 |
| PONTIAN DISTRICT | 665 | 19,214 | 70 | 13,118 | 33,067 | 29,677 | 3,267 | 16,855 | 165 | 14,072 | 64,036 | 97,103 |
| Kota Tinggi | 462 | 7,224 | 656 | 6,936 | 15,278 | 9,521 | 11,655 | - | 284 | 2,343 | 23,803 | 39,081 |
| Part of Dlu Sg. Johor | 30 | 7,466 | 594 | 4,662 | 12,752 | 2,023 | 9,324 | - | - | 6,993 | 18,340 | 31,092 |
| Sedili Kechil | - | 19,753 | 7 | 556 | 20,316 | - | 11,655 | - | - | - | 11,655 | 31,971 |
| Johor Lama | 186 | 1,313 | 32 | - | 1,531 | 1,641 | 16,405 | 50 | 33 | 8 | 18,137 | 19,668 |
| Tg. Surat | 607 | 7,766 | 19 | 6,707 | 15,099 | 4,079 | 12,804 | 60 | 42 | 4 | 16,989 | 32,088 |
| Pantai Timor | 332 | 12,419 | 835 | 2,137 | 15,723 | 1,641 | 4,629 | 364 | 163 | 757 | 7,554 | 23,277 |
| Penggerang | 47 | 5,681 | 231 | 6,243 | 12.202 | 1,970 | 2,752 | 1,016 | 108 | 190 | 6,036 | 18,238 |
| Part of KOTA TINGGI DISTRICT | 1,664 | 61,622 | 2,374 | 27,241 | 92,901 | 20,875 | 69,224 | 1,490 | 630 | 10,295 | 102,514 | 195,415 |
| STUDY AREA | 15,571 | 111,415 | 2,534 | 60,956 | 190,476 | 119,606 | 112,815 | 19,215 | 941 | 27,706 | 280,283 | 470,759 |

* It is assumed that the limits of the revised MPJB area also refers to the Mukim of Johor Bahru. The MPJB limits were extended from 6,988 ha. to 11,940 ha. in 1976.

\+ Others include scrub forest, grassland, cleared land.

Sources:
1. I.F.T. Wong, Present Land Use of Peninsular Malaysia (1974 & 1966)
2. Resource Maps (1979)
3. Department of Land & Mines (1981)
4. Department of Agriculture, Annual Reports (1977, 78, 79, 80)




SCALE - 1cm. is to 3.2km.



# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- Rubber
- Oil Palm
- Other Crops
- Forest/Swamp/Cleared Land
- Urban Areas
- Mine

TITLE:

EXISTING REGIONAL LAND USE (1980)

MAP NO.

Fig. 2.5

## 2.2.2 The Johor Bahru-Pasir Gudang Corridor

The town of Johor Bahru has been expanding rapidly over the last ten years. In 1976, the Majlis Perbandaran Johor Bahru (MPJB) extended its town limits to cover an additional 4,955 ha. (29,510 acres). Subsequently, the MPJB limits now encompases an area of approximately 12,000 ha. (See Table 2.5).

Over the years, much agricultural land has been converted for housing purposes. In 1980, housing utilised 27.0% of the MPJB area followed closely by institutional uses (Government reserve, schools, religious uses) which make up 11.6%. There is still much land available for future development as 37.2% of the total area is non-built-up area.

Generally it can be observed that the decrease in residential density corresponds with distance away from the CBD. Residential development within the CBD is typified by the usual traditional shophouses and medium density housing of 15 units per hectare.
Significant among such urban housing are the high-rise flats to the east of the railway station; their proximity to the CBD is seen as sensible in that it allows the low-income occupants access to work and urban opportunities without incurring transport costs. Yet another high-rise public-housing project is underway slightly north of the CBD. On the outskirts of the local council area are middle-class housing consisting of typical terraced, semi-detached and detached housing. The average density of such development is in the region of 30 - 40 units per ha.

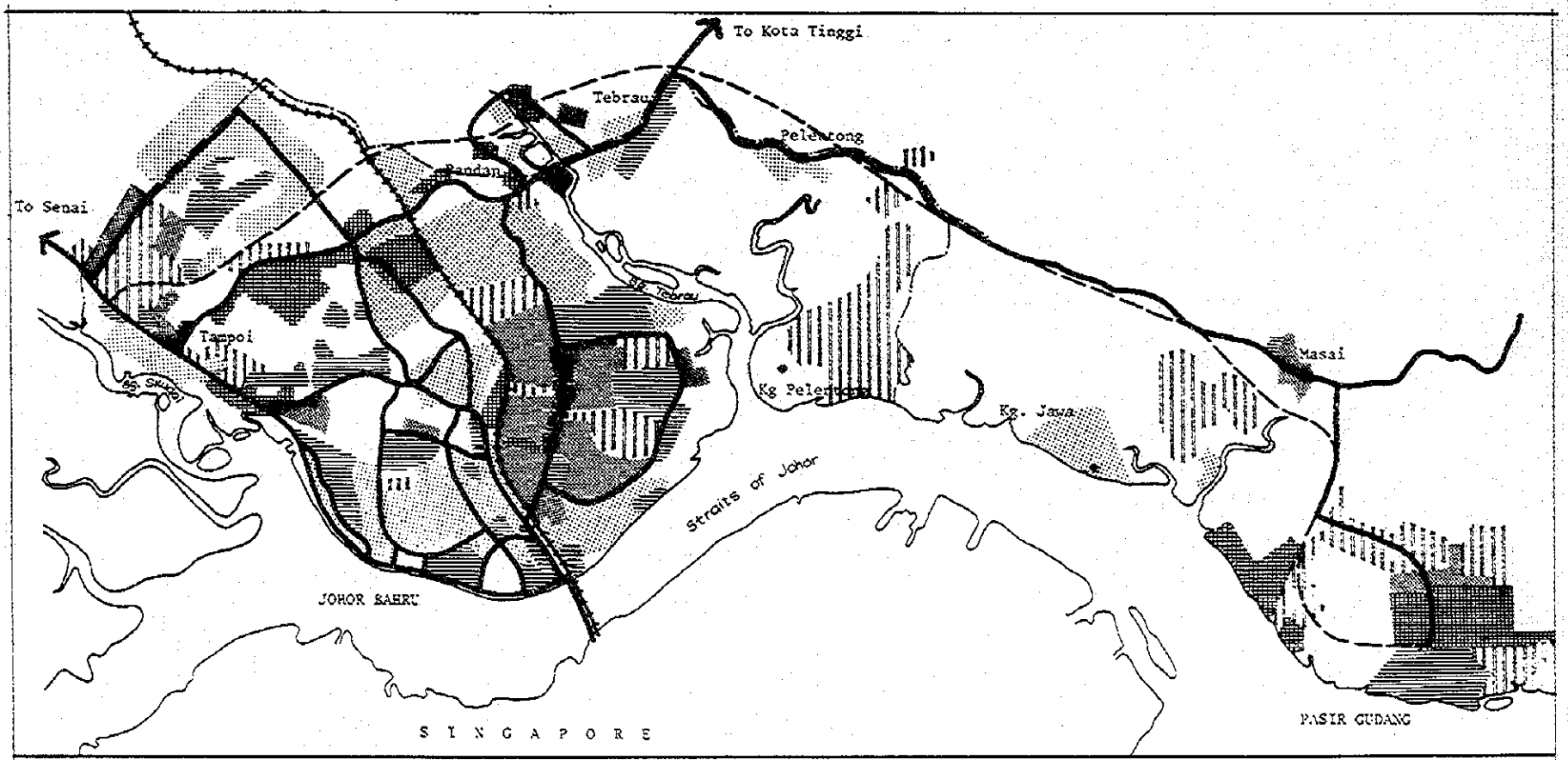



Fig. 2.6
Existing Landuse in the Johor Bahru - Pasir Gudang Corridor (1980)

Table 2.5 : Land Use in MPJB (1980)

| Land Use/Area | Land Use | | % |
|---|---|---|---|
| | Acres | Hectares | |
| Residential | 7,944 | 3,215 | 27.0 |
| Commercial | 657 | 266 | 2.2 |
| Institutional | 3,437 | 1,392 | 11.6 |
| Industry | 1,010 | 408 | 3.4 |
| Open Space | 920 | 372 | 3.1 |
| Others | 4,569 | 1,849 | 15.5 |
| Built-up Area | 18,537 | 7,502 | 62.8 |
| Non-built-up Area | 10,967 | 4,438 | 37.2 |
| Total MPJB Area | 29,504 | 11,940 | 100.0 |

Source : Structure Plan Unit, Johor State Town and Country Planning (1981).

The Central Business District (CBD) is located in a tight package about the causeway area. The CBD itself is a contrasting combination of traditional shophouses and modern office-cum-shopping-cum-hotel complexes. Within the past 5 years or so, multi-storeyed complexes in the like of Tropical Inn, Merlin Tower and Complex Tun Abdul Razak have developed within the CBD. However, hampered by zoning constraints, various new commercial developments have been diverted out of the CBD into the suburban housing estates to the north. As a result, a somewhat sub-centre development is taking place along the Jalan Tebrau stretch (See Fig. 2.6). Prominant among such 'external' commercial development is the Holiday Inn Complex now under construction in the Century Garden locality. On the western limits of the MPJB, Tampoi itself is a sub-centre.

Within the MPJB area, the CBD commands only 38% of total commerical floorspace. While 23% are located in the outlying sub-centres of Tampoi, Century Garden and Taman Sri Tebrau. (See Table 2.6). These suburban centres have thrived mainly in response to the rapid growth of residential development in this area.

Table 2.6 : Existing Commercial Areas in MPJB

| Location | No. of Commercial Establishment | Commercial Floorspace | | |
|---|---|---|---|---|
| | | ('000 sq. ft.) | $m^2$ | % |
| CBD | 1,795 | 2,658.4 | 246,970 | 38 |
| Tampoi | 248 | 340.9 | 31,671 | 5 |
| Century Garden | 345 | 455.1 | 42,280 | 6 |
| Taman Sri Tebrau | 483 | 805.5 | 74,834 | 11 |
| Other Areas | 2,075 | 2,751.5 | 255,623 | 40 |
| Total MPJB Area | 4,946 | 7,011.6 | 651,378 | 100 |

Source: Commercial Land Use Survey in MPJB Area, 1978

With the exception of the industrial estate at Tampoi/Larkin where the larger industries are mostly confined, smaller-scale industries are located in a fairly disposed pattern within the MPJB area[7], namely along Jalan Scudai and Jalan Tampoi. While these small-scale, cottage-type industrial development appears highly desireable in the context of the present emphasis of encouraging new Malay enterprises, such scattered industries frequently lack appropriate infrastructure such as adequate water and power supply, proper loading and unloading areas, storage facilities, etc. Consequently, the lack of planning control over their development has tended to give rise to environmental problems through excessive noise,

7. A Report on Industries in Johor Bahru, Johor Town and Country Planning Department.

The unprecedented rate of growth experienced by Johor Bahru has been attributed to two main factors; firstly, heavy Government investments in in the new port at Pasir Gudang, the airport at Senai and various industrial estates, some of which enjoy free trade advantages, have acted to emphasise the importance of Johor Bahru as an urban centre; secondly, it is probable that spill-over effects and investments from Singapore itself have further accelerated its development.[8]

The massive investment by the public sector has resulted in enhancing the development potential of large areas of land around Johor Bahru and along the land corridor between Johor Bahru and Pasir Gudang, especially so for housing development.

Two major housing schemes, Permas Jaya (207 ha.) and Gunung Hijau (136 ha.) are under construction along the Johor Bahru-Pasir Gudang corridor while several others totalling an area of about 1,226 ha. are pending approval along the same corridor area.

8. A concensus gathered from newspaper reports, planning studies and discussions with related authorities.

## 3.0 THE DEVELOPMENT COMMITMENTS

### 3.1 Regional Development Commitments

It is imperative that the impact and implications of major commitments and proposals relating to the Study Area be taken into account and incorporated into the future development framework to ensure the maximum benefits from current investment programs. Broadly, the programs comprise of the following:

(a) Fourth Malaysia Plan (1981-85)
(b) Johor Tenggara Regional Development Scheme (Target Year - 1990)
(c) Johor Barat Drainage Scheme (Target Year - 1990)
(d) Other committed development projects

#### 3.1.1 Fourth Malaysia Plan Strategies and Policies in the Johor Context

The Fourth Malaysia Plan (FMP) will further elaborate and refine measures and programs to meet the objectives of the New Economic Policy (NEP). To achieve this, the Johor State Government aims to create and expand work opportunities in various fields thereby reducing the gap between income classes, at the same time modernising the rural society and improving living conditions of the urban poor.

Various programs and projects will be implemented to achieve the NEP. The Federal Government has allocated nearly $2,800 million for the Johor Government to carry out these development plans. The emphasis on rural development is clearly reflected in the State expenditure allocation; over 41% of the State FMP expenditure is for agriculture and rural development, namely the ongoing regional development

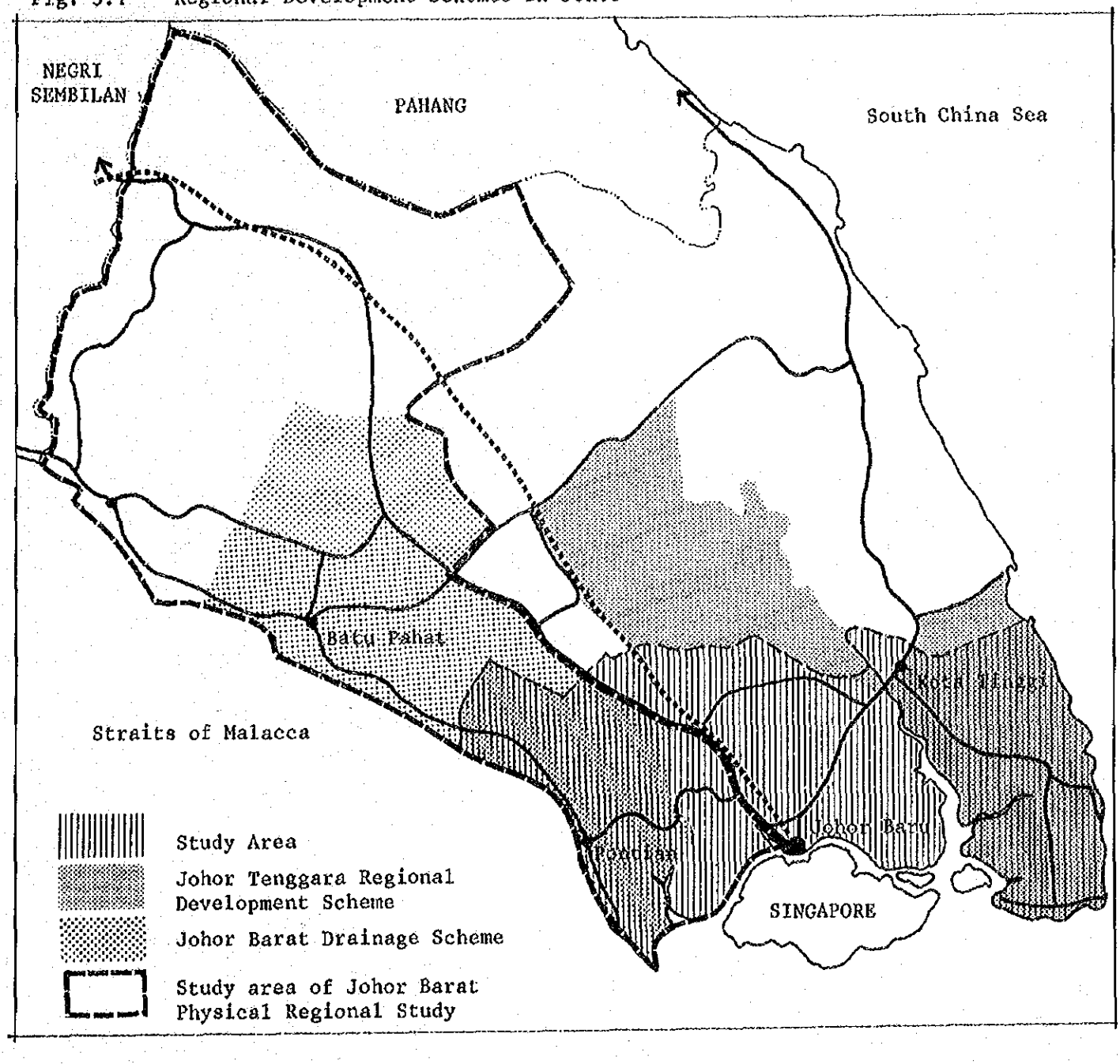
schemes. This is followed by infrastructure development (transport, communications and public utilities) which account for 23% of total expected expenditure. (See Table 3.1).

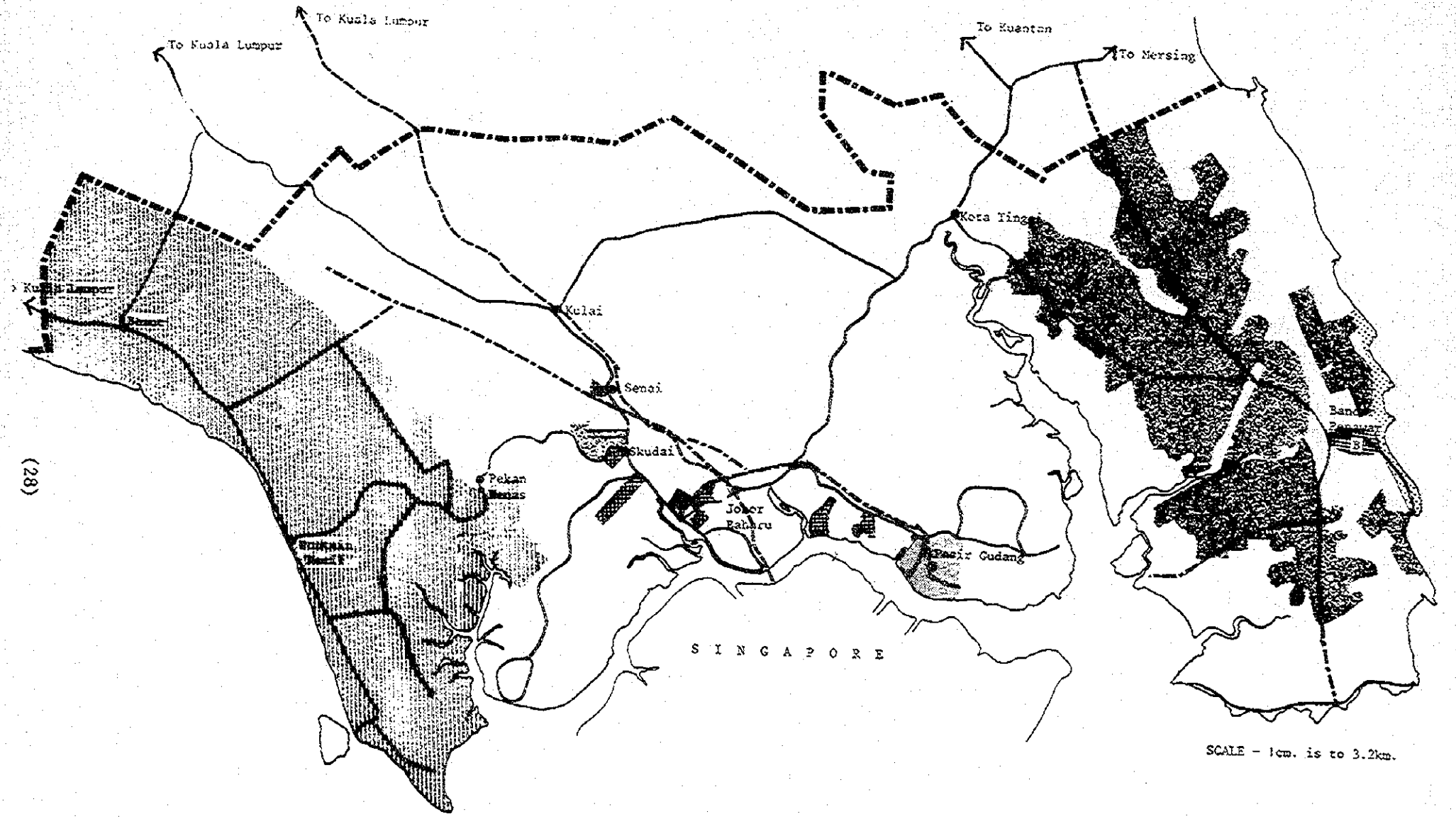
Table 3.1 : Fourth Malaysia Plan Allocations for Johor State (1981 - 85)

| | Third Malaysia Plan Allocations at Johor State Level | | FMP Allocation at National Level | FMP Allocation at Johor State Level | |
|---|---|---|---|---|---|
| | ($ million) | (%) | ($ million) | ($ million) | (%) |
| (ECONOMIC) | (1,974.60) | (75.4) | (22,764.50) | (2,064.02) | (75.8) |
| Agriculture & Rural Development | 1,006.44 | 38.4 | 8,359.10 | 1,132.96 | 41.6 |
| Commerce & Industry | 187.70 | 7.2 | 5,433.05 | 309.64 | 11.4 |
| Transport | 354.96 | 13.6 | 4,116.07 | 273.43 | 10.0 |
| Communications | 186.77 | 7.1 | 1,523.52 | 129.83 | 4.8 |
| Energy & Public Utilities | 238.73 | 9.1 | 3,284.76 | 220.16 | 8.0 |
| (SOCIAL) | ( 445.07) | (17.0) | ( 6,388,14) | ( 501.75) | (18.4) |
| Education & Training | 174.48 | 6.8 | 2,992.83 | 284.75 | 10.4 |
| Health & Population | 42.19 | 1.6 | 588.44 | 44.19 | 1.6 |
| Information & Broadcasting | - | - | 152.62 | 7.6 | 0.3 |
| Housing | 199.96 | 7.6 | 1,458.00 | 116.48 | 4.3 |
| Community Services & Development | 19.49 | 0.7 | 549.77 | 41.06 | 1.5 |
| Others | 8.95 | 0.3 | 441.48 | 7.67 | 0.3 |
| (SECURITY) | ( 111.55) | ( 4.2) | (9,371.55) | ( 120.56) | ( 4.4) |
| (ADMINISTRATION) | ( 88.37) | ( 3.4) | ( 805.31) | ( 37.25) | ( 1.4) |
| Total Federal Funds | 2,619.59 | 100 | 39,329.50 | 3,723.50 | 100 |
| State Funds | - | | 1,380.00 | - | |
| Statutory Funds | - | | 2,120.00 | 205.60 | |
| Grand Total | 2,619.59 | | 48,829.50 | 2,929.18 | |

Source : Fourth Malaysia Plan (1981 - 85).

Fig. 3.1 Regional Development Schemes in Johor








# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- Housing under construction/ Approved for construction Committed industrial site
- UTM campus
- Pasir Gudang Complex (Housing, town centre, industry & port)
- Bandar Penawar New Town (Housing, town centre & industry)
- Agricultural schemes (underway)
- Tourist complex

Johor Tenggara Devt. Scheme

- Johor Barat Drainage Scheme
- Road projects

MAP NO.

FIG Fig. 3.2 Committed Projects

### 3.1.2 Johor Tenggara Regional Development Scheme

The Johor Tenggara Regional Development Scheme commenced during the Second Malaysia Plan and is targeted to be fully implemented by 1990. It covers an area of approximately 300,000 ha. (that is 16% the State of Johor). The development comprises of two main distinct subregions - Johor Tengah and Tanjung Penggerang. Tanjung Penggerang occupies the eastern flank of the Study Area. (See Fig. 3.3).

The basic objective of Johor Tenggara is to promote economic and social development through land development and settlement supplemented by subsidiary industries based on the agricultural sector and the economic utilisation of forest resources and other activities.

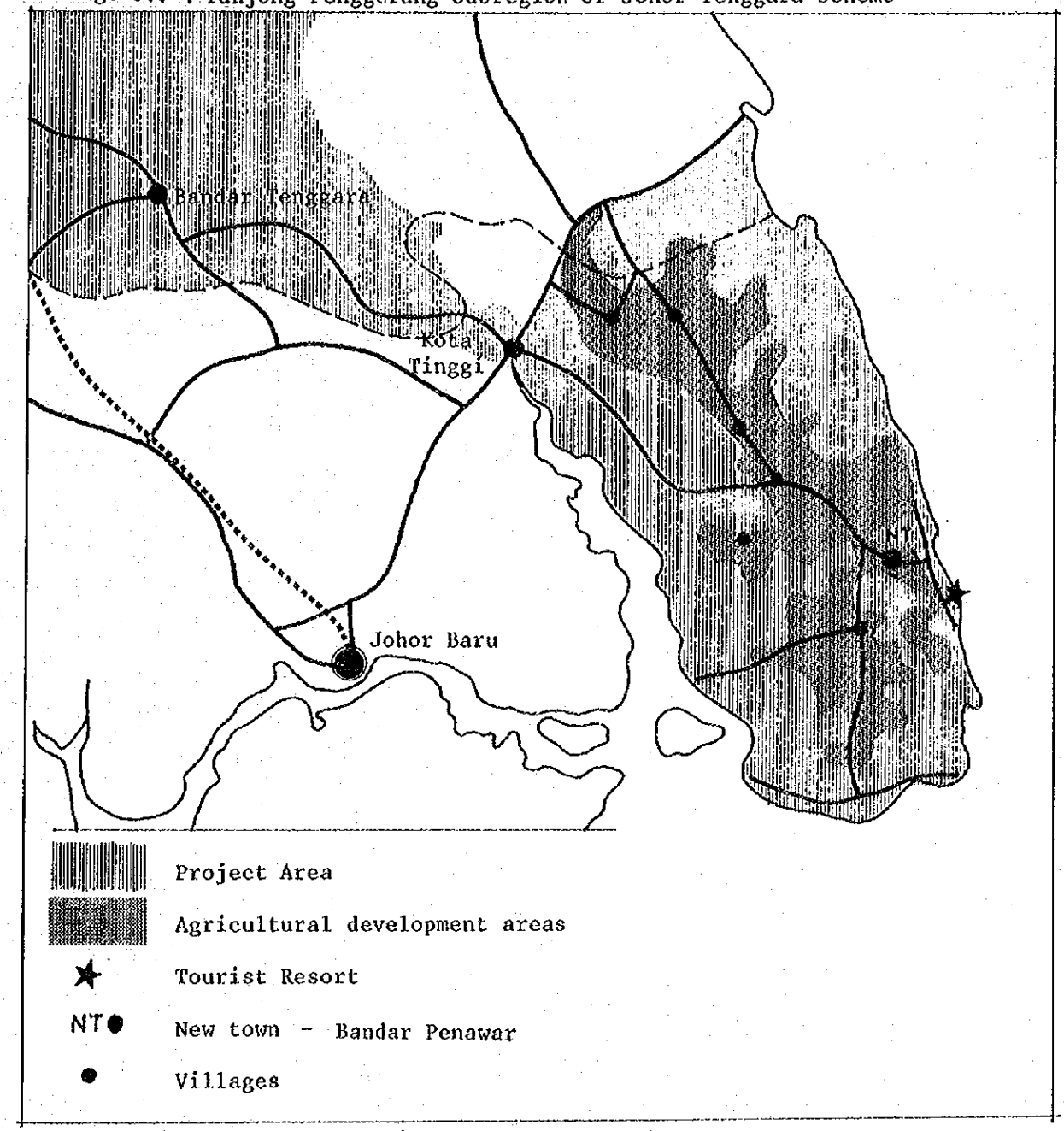
Originally intended to contain a population of 460,000 in the year 1990, the population targets were revised in 1980 as follows:

Table 3.2 Target Population in Johor Tenggara Scheme

| Year | Total Population |
|---|---|
| 1985 | 196,080 |
| 1990 | 252,180 |
| 1995 | 322,700 |

Source: Johor Tenggara Transportation Study (1980)

Fig. 3.3 : Tanjong Penggerang Subregion of Johor Tenggara Scheme




Source: Johor Tenggara Regional Masterplan, 1971.

Other than the development of agricultural and dairy-farming activities, the Tanjung Penggerang area also contains an extensive tourist complex at Tanjung Penawar, the new township of Bandar Penawar besides six other growth centres. Linking these nodes, together and with the adjacent regions, will be a comprehensive network of regional and rural roads.

These are several landuse implications of the Tanjung Penggerang and even the Johor Tengah developments on the Study Area. Agricultural products in the form of palm oil, rubber, poultry, dairy goods, logged timber need to be transported to the Pasir Gudang port area for export and to the market in Johor Baru and other towns. This, coupled with the increase of tourist traffic to the coastal tourist complex is bound to exert an increased demand on the existing road network.[1] New roads or road improvements are to be anticipated.

Growth impetus is expected to increase in the town of Kota Tinggi which is located at the threshold point to the Tanjung Penggerang area.

1. The Johor Tenggara Transportation Study - Interim Report, Vol. 1 (1980) writes that current patterns of travel show a very strong pull of the existing centres outside the region and until the new urban centres such as Bandar Penawar and Bandar Tenggara assume their comprehensive roles, the pull of existing urban centres outside the region will persist.

### 3.1.3 Johor Barat Drainage Project

Another major proposal which affects a substantial area of the Study Area is the Johor Barat Drainage Project. While the Johor Tenggara project attempts diversification on two fronts, that is, agriculture and industrialisation, the Johor Barat scheme is basically a comprehensive agricultural development plan. By far, it is the largest agricultural engineering project ever implemented in Peninsular Malaysia. The project aims to provide flood alleviation, prevent saline ingress, improve drainage, give access benefits to the entire coastal plain from Muar to Kukup, and eventually to reclaim the peat swamps. Other benefits would be:

- increased production of healthy and high-yield crops
- more land for farming ventures and live-stock production
- more job opportunities
- increased communication facilities

The engineering works for Phase 1 of this project involved construction of coastal embankments, construction of tidal control structures, canalisation and/or diversion of rivers, construction of laterite-surfaced access roads.

Within the Study Area, this Scheme would have a direct effect on 90,000 ha. as shown in Table 3.1.2. Over 34,000 smallholder farmers are expected to benefit from the scheme.

Table 3.3 : Areas within Johor Barat Drainage Scheme (Ha.)

| | Pontian | Johor Bahru | Total |
|---|---|---|---|
| Total area affected by the scheme | 90,247 | 14,124 | 104,371 |
| Total area above +50.00 Msl & does not benefit from the scheme | 1,457 | 7,042 | 8,499 |
| Area below +5.00 Msl & too low to be reclaimed | 9,713 | - | 9,713 |

Source: South Johor Regional Planning and Development Study (1974)

Yet another future implication of the scheme concerns the land usage of this area. With improved drainage and irrigation, Soil conditions will improve, thereby allowing the choice of crop-type to be less restrictive than it presently is. An efficient irrigation system will enable a more productive use of underutilised agricultural land in the form of new crops, double-cropping, etc.

In December, 1980, a study[2] on Physical Planning within the Johor Barat Agriculture Project area and its periphery area was produced out of the realisation that while the Johor Barat Agriculture Project had been more precise in its planning of agricultural development, it had touched little, if any, on other related aspects such as economic structure, demographic patterns, social amenities, etc. Consequently, the Physical Regional Study is concerned with identifying the Problems and possibilities of economic growth within the region and to project and indicate the future direction of growth.

The report estimates a population of over 160,000 within the Pontian District by the year 1990. The proposed landuse for 1990 for Pontian and its fringe area is predominantly oil palm and pineapple with considerable areas for mixed farming. Within this area are also located the proposed sub-regional centres of Pontian Kecil and Saleng. (Refer Fig. 3.3).

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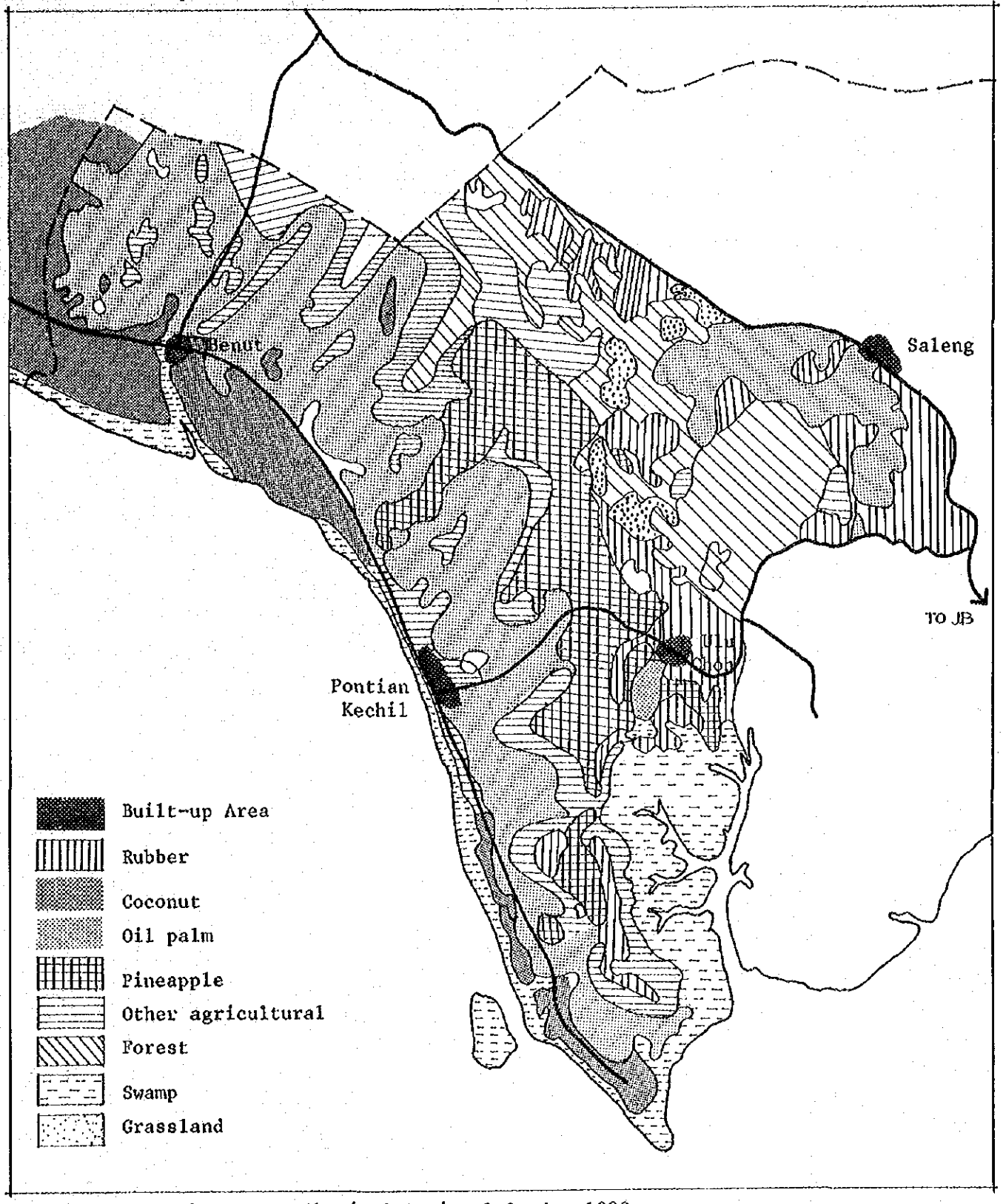
2. Johor Barat Physical Regional Study, Federal Town and Country Planning Department (1980).

Fig. 3.4 : Proposed Land Use for the Pontian Area (1980)




Source: Johor Barat Physical Regional Study, 1980.

3.2 Pasir Gudang Complex

The Pasir Gudang Complex[3] consisting of the general industry area, free trade zone, port, town centre and residential areas is intended as a regional growth pole in South Johor. Planned over an area of 2,654 ha., it is expected to accomodate a target population of about 235,000 besides attaining an eventual employment capacity of supporting over 300,000 people including dependents. The main components of this complex are in Table 3.4

Table 3.4 : Pasir Gudang Complex Land Use Pattern

| Land Use Components | Area (ha.) |
|---|---|
| General Industry | 896 |
| Free Trade Zone | 32 |
| New Town - Town Centre | 57 |
| - Residential Area | 868 |
| - Neighborhood Shopping centres | 15 |
| Public Reserves (LLN, Telecoms, schools, reservoirs) | 195 |
| Other Reservoirs | 392 |
| Port Area (Under Johor Port Authority) | 199 |
| Total | 2,654 |

Source: Potential Investment in Johor, Johor SEDC (1977)

Although originally planned to be fully implemented by 1990[4] , the Pasir Gudang Complex however, has just embarked on its initial stage. Subsequently, taking into account the preliminary stage of development and various physical and

3. Within the Pasir Gudang Complex, the town centre and the residential areas are referred to as the Pasir Gudang New Town.
4. The Concept Plan for Pasir Gudang, New Town (1981) was done in an effort to update the original plan of 1975, ie. the Pasir Gudang Structure Plan (1975) by the Johor Town and Country Planning Department.

policy changes in the area as well as from the standpoint of the profit-making operations of the Johor SEDC, the Concept Plan Study Team proposed a modified population and housing target for the new town covering a slightly more extensive area. (Table 3.5).

Table 3.5 Pasir Gudang New Town-Population and Housing

| | Structure Plan Team (Target Year-1990) | Concept Plan Team (Target Year-2000) |
|---|---|---|
| Population | 156,000 | 193,900 |
| Housing | 30,000 | 37,300 |
| Total Area | 2,654 | 2,873 |
| Housing Density | 35 units/ha. | 42 units/ha. |

However, up to 1980, only 1,144 housing units (376 wooden terrace houses and 768 flat units) had been completed by the Johor SEDC. While a further 736 units of walk-up flats and 514 units of terrace houses are being constructed (See Fig. 3.2.1). Other agencies namely, Malaysia Shipyard & Engineering and Syarikat Pembinaan have both constructed about 576 housing units while a further 234 low cost houses are being built by LLN.

Table 3.6 : Residential Development in Pasir Gudang(1981)

| Agencies | Completed | Under Construction | To Be Constructed |
|---|---|---|---|
| 1. Lembaga Letrik Negara (LLN) | - | 234 | - |
| 2. Malaysia Shipyard & Engineering (MSE) | 480 | - | - |
| 3. State Economic Development Corporation (SEDC) | 1,144 | 514 | 2,016 |
| 4. Syarikat Pembinaan | 96 | - | - |
| Total | 1,720 | 748 | 2,016 |

Source: Johor State Economic Development Corporation (1981)

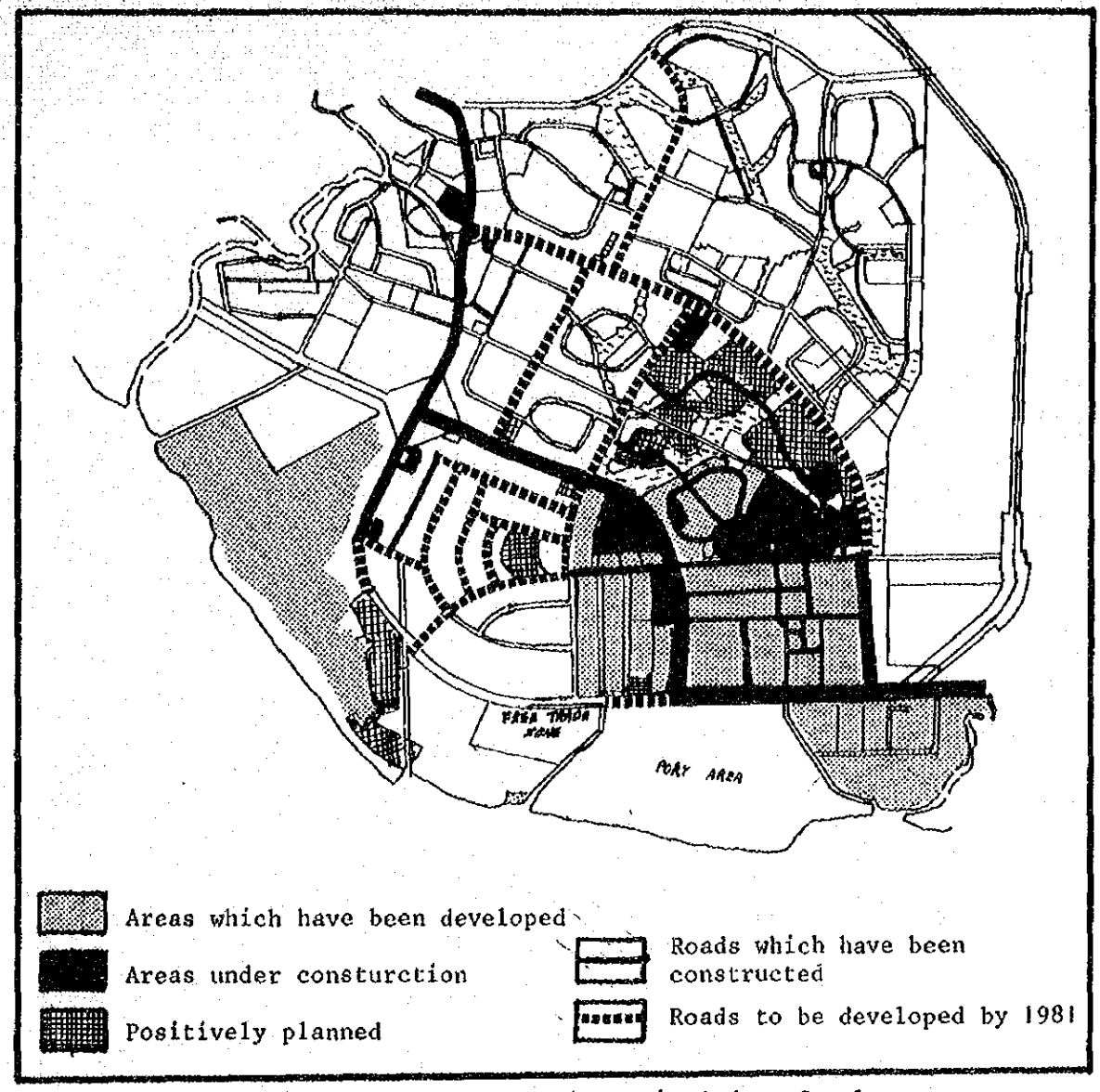



Fig. 3.5 ; Stage of Development in Pasir Gudang Complex

About 517 ha. of the industrial site had been developed up to 1980 with 55 factories in full operation and 23 others under construction. Also in operation is the 12th. biggest shipyard in the world - Malaysia Shipyard and Engineering Sdn. Bhd.

## 3.3 Other Development Commitments

Apart from the preceding regional development schemes, there are various other independent development commitments of sufficient magnitude to constitute major determinants of the shape and structure of the immediate future growth. They are listed as below:

### 3.3.1. Infrastructure

The major infrastructure proposals relating to the Study Area are:

(i) Construction of expressway between Johor Bahru and Pasir Gudang

(ii) Upgrading of road link from Federal Route 1 to Pontian and to Kota Tinggi

(iii) Construction of new rural roads in the Pontian and Tanjong Penggerang areas.

a). Road Network

Existing major road network pattern in the study area which forms primarily a radial configuration, converges onto Johor Bahru; among these are the Federal Route one which is used as a nationwide highway. Toll express way and JB-PG linkage road are now under construction and they are expected to improve and reinforce the existing capacity of the network system running in the direction of East and North West of Johor Bahru. In addition to this, many new roads as well as road improvements and widening are proposed in the various development programs. Johor Barat scheme proposes new roads in Pontian district whilst South Johor Regional Study and Johor Tenggara in South Johor Region and Tanjong Penggarang respectively. Figure 3.7 shows the combination of the existing and the proposed networks in the projects. However, the feasibility of the proposed roads in the primary area have to be reviewed in the light of the findings and recommendations of this study, therefore, these roads can be omitted from the components of the future road hierarchy pattern for the time being (See Fig. 3.6)

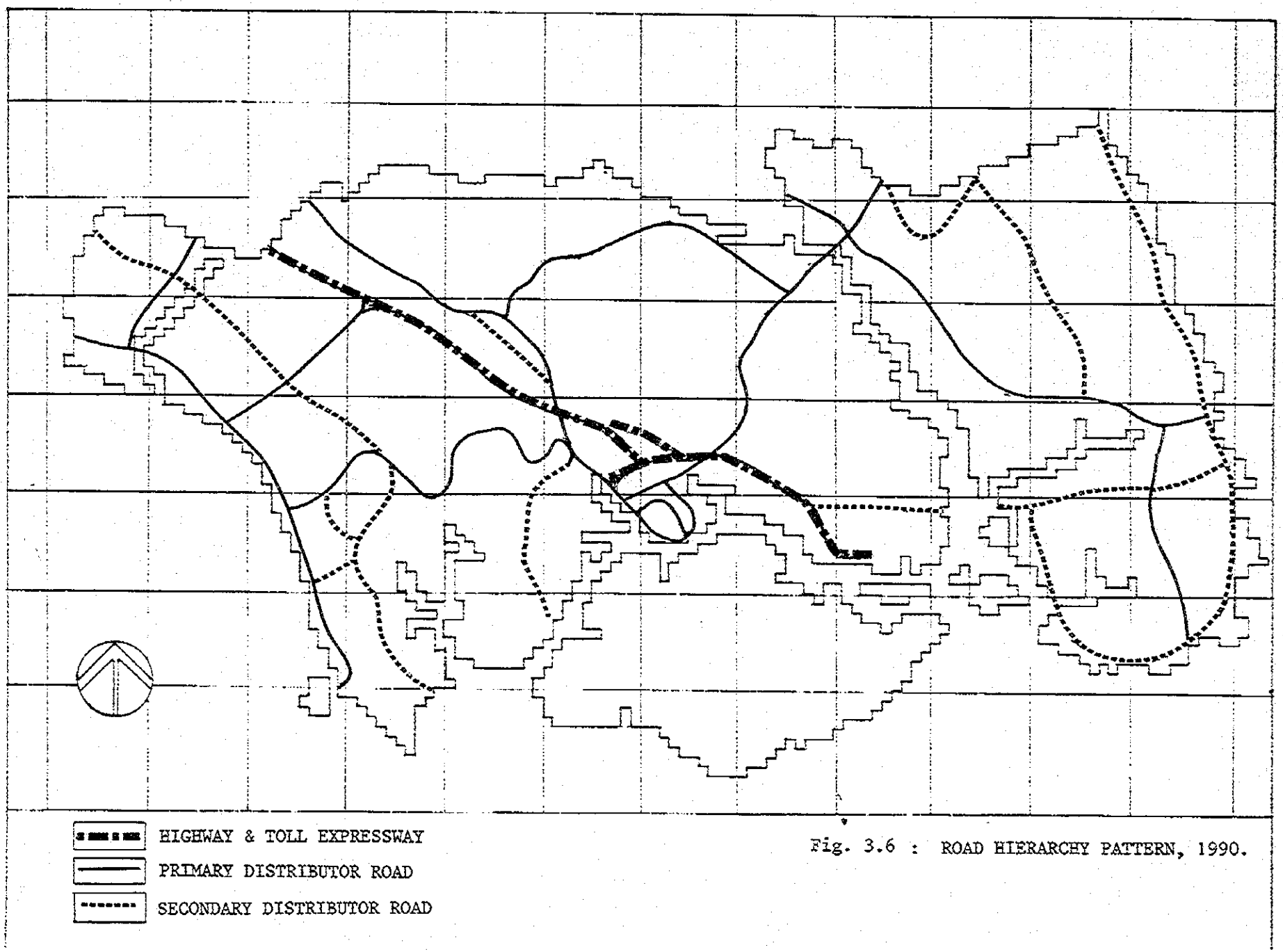



Fig. 3.6 : ROAD HIERARCHY PATTERN, 1990.

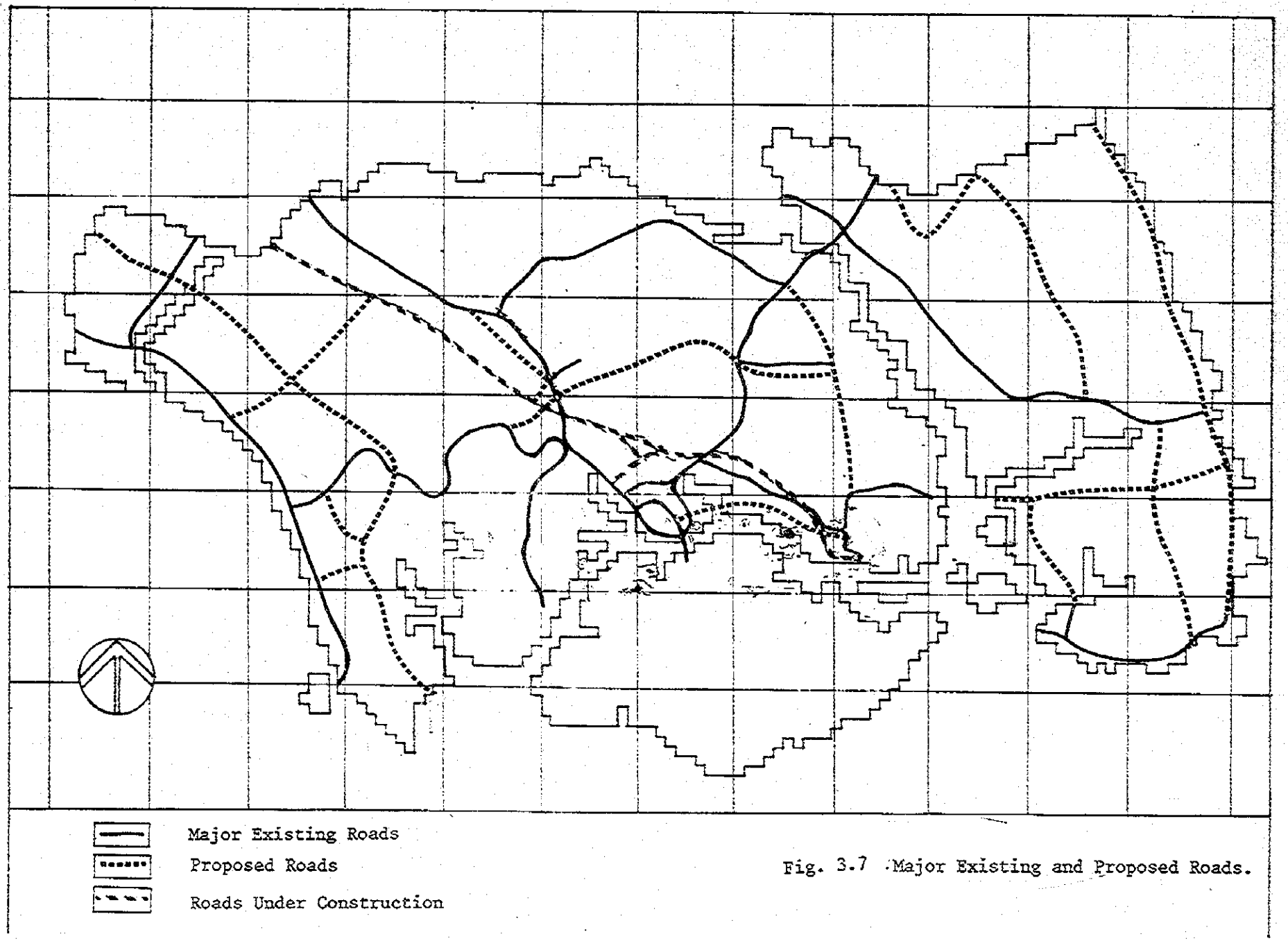



Fig. 3.7 Major Existing and Proposed Roads.

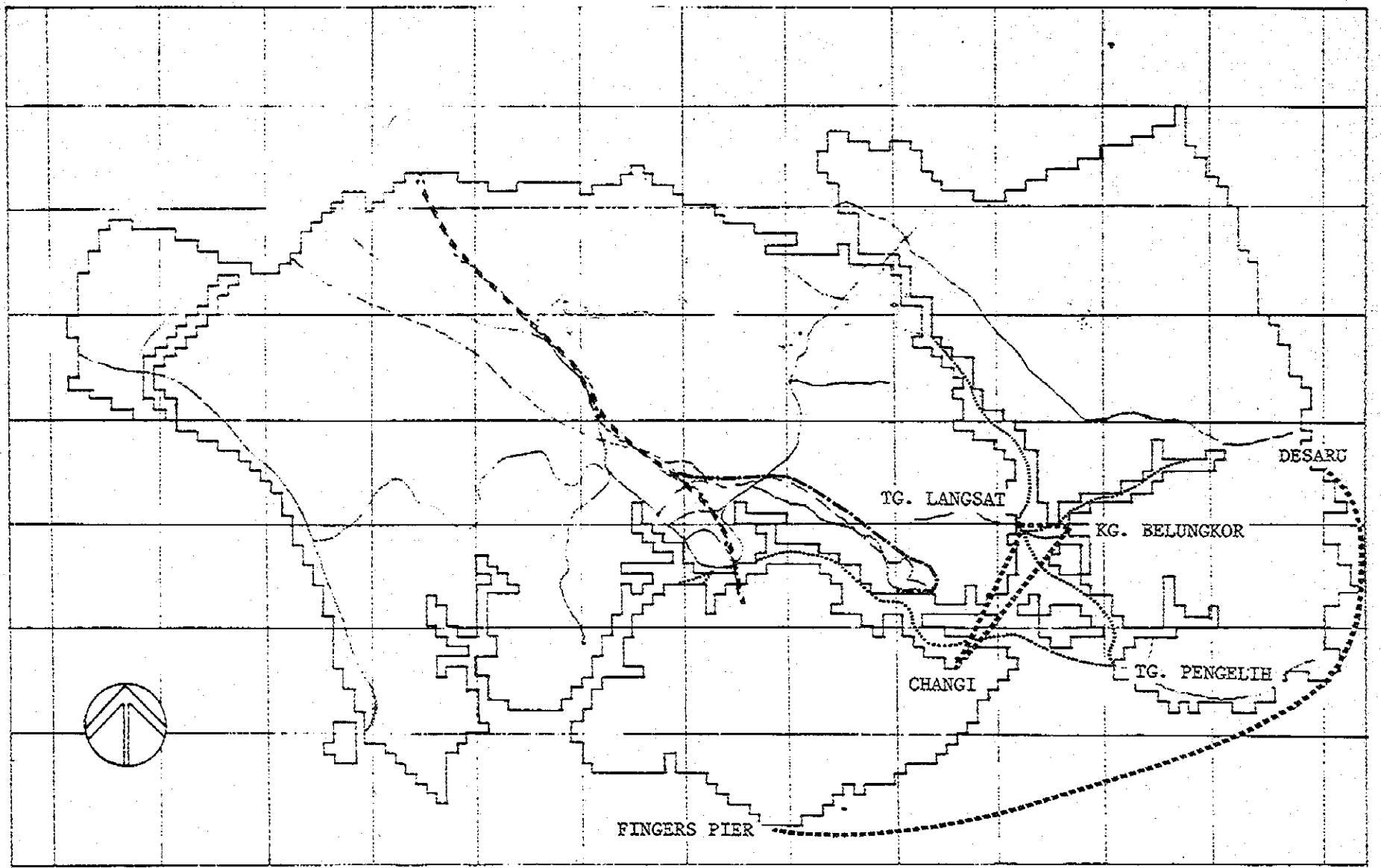



Fig. 3.8 Railway and Ferry Network (Existing and Proposed)

b) Railway and Ferry Network

According to Malayan railway, the number of passengers alighting at various stations between Gemas and Singapore in 1974 was 434,572. With the introduction of Express Rakyat a further increase in the number of passengers is anticipated.

Freight services are undertaken by cargo trains. From the actual commodity flow between Singapore and Johor in 1974, it appears that the role of the railway in terms of providing freight services is rather insignificant even though it has tremendous capacity particularly, for expansion. With the opening up of Johor Port at Pasir Gudang, it is anticipated that by 1980, about 20% of the commodity normally exported through Singapore will be diverted to Johor port if a railway linking them is built. Figure 3.8 shows the railway alignment and existing and proposed passenger ferry service

Table 3.7 : Number of passengers in 1978

| Station | Number of Passengers |
|---|---|
| Singapore | 177,155 |
| Johore Bahru | 175,306 |
| Others | 82,111 |
| Total | 434,572 |

Source : The report on economic survey 1978

Table 3.8

Commodity Flow Between Singapore and Johor 1974

(a) Imported From Singapore

| Mean of Transportation | | Volume (Metric Tons) |
|---|---|---|
| (i) | Road | 1.380 million |
| (ii) | Railways | 0.073 million |
| (iii) | Others | 0.04 million |
| | | 1.457 million |

(b) Exported to Singapore

| Mean of Transportation | | Volume (Metric Tons) |
|---|---|---|
| (i) | Road | 0.005 million |
| (ii) | Railways | 0.207 million |
| | | 2.211 million |

Source: The report on economic survey 1978.

c) Port and Airport

The airport in the state of Johor is located at Senai which is about 14 miles north of Johor Bahru. The airport commenced its operations on 1st. January, 1974. The airport only handles aircrafts on domestic flights. Total number of passengers boarded at the airport in 1976 was 29,752. It is estimated that the airport has handled only 16 metric tons of cargo in 1976[18].

The Johor port located at Pasir Gudang, about 16 miles from Johor Bahru is developed in two phases to coincide with the Second and Third Malaysia Plans. The initial development covers merely an area of 100 ha, out of a total area of 200 ha. Cargoes handled by the port from January to May 1977 is as shown in Table 3.9 Types of cargo handled are mainly palm oil, granite and woodchips.

Table 3.9: Cargoes Handled by the Port from January to May 1977

| Port Premises | Import | Export | Total |
|---|---|---|---|
| No of ships | - | - | 89 |
| Liquid Cargo | 11,170.7 | 74,782.1 | 85,952.8 |
| Dry Cargo | 85,984.5 | 2,716.1 | 88,700.6 |
| Sub-total | 97,155.2 | 77,498.2 | 174,653.4 |
| **Private Jetties** | | | |
| No. of ships | - | - | 268 |
| Liquid Cargo | 80,035.9 | 297.8 | 80,333.7 |
| Dry Cargo | 1,938.3 | 163,514.0 | 165,452.3 |
| Sub-total | 81,974.2 | 163,811.8 | 245,786.0 |
| Grand Total | 179,129.4 | 241,310.0 | 420,430.4 |

Source : Report on Economic Survey of Johor 1978

18. Source : Report on Economic Survey of Johor 1978.

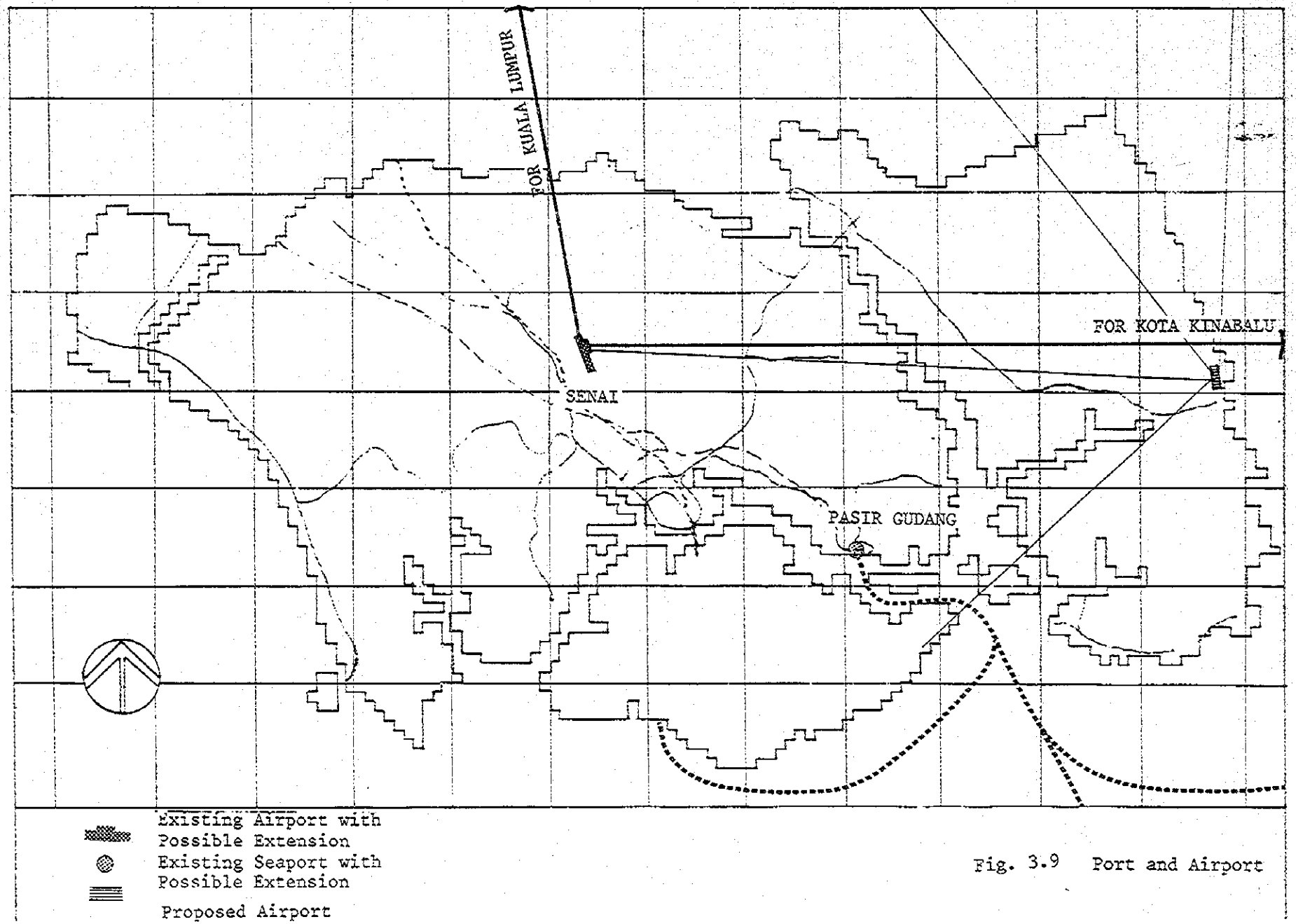



Fig. 3.9 Port and Airport

### 3.3.2 . Housing

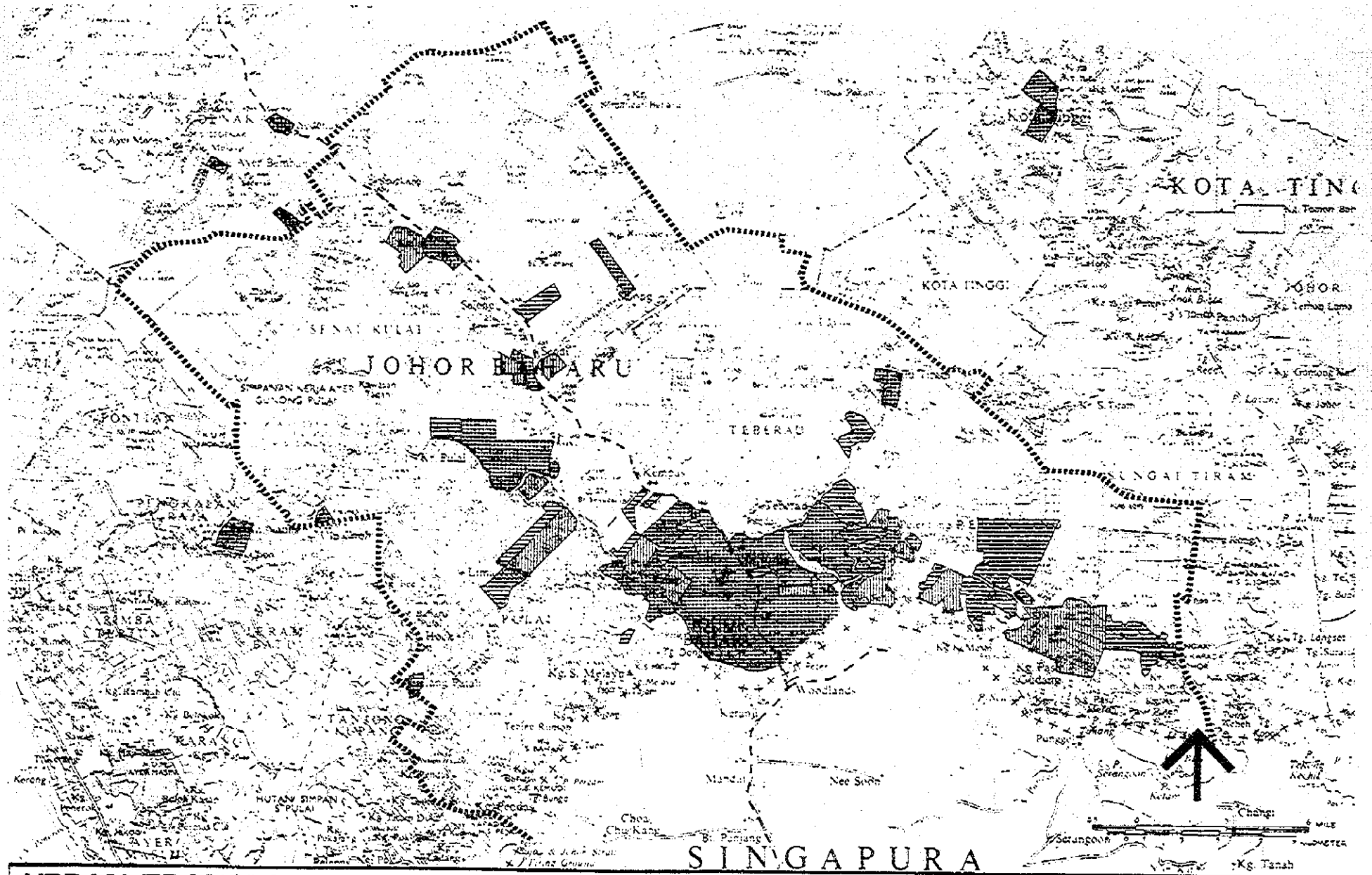
A total of 11 housing schemes are under construction and a further two more are already approved for construction in the Study Area. When completed, they will provide over 63,000 housing units for approximately 593,000 people (see Table 3.10). Almost half of these houses will be located at Taman Permas Jaya and Taman Kota Putri, the two largest schemes in the area. In addition, there are 18 other schemes on the application list offering a total of 67,600 houses (For full list, See Appendix 4.1). The majority of these schemes are located along the land corridor stretching from Kulai to Johor Bahru across to Pasir Gudang.

On the other hand, over 8,000 units of public low-cost housing have been committed to the responsibility of the State Housing Department under the Fourth Malaysia Plan. However, it is doubtful as to whether these proposals will take off judging from the rate of construction in the public sector during the Third Malaysia Plan period; during this period, only 26% of a total 50,711 were completed (of the 50,711 units, over 70% were carried forward from the Second Malaysia Plan).

Table 3.10 : Housing Projects in the Study Area (as at 1981)

| | HOUSING PROJECTS | AREA (HA.) | HOUSING UNITS | ESTIMATED POPULATION |
|---|---|---|---|---|
| within MPJB | UNDER CONSTRUCTION | | | |
| | 1. Taman Permas Jaya | 511 | 11,440 | 57,200 |
| | 2. SEDC | 394 | 5,892 | 29,460 |
| | 3. UDA - Phase 1 | 30 | 871 | 4,355 |
| | - Phase 2 | 85 | 2,855 | 14,275 |
| | 4. Taman Sentosa | 102 | 1,827 | 9,135 |
| Outside MPJB | 1. Taman Skudai | 90 | 2,829 | 14,160 |
| | 2. Taman Tun Aminah | 987 | 11,502 | 120,000 |
| | 3. Pasir Gudang New Town | 380 | 37,300 | 235,500 |
| | 4. Taman Dawani | 30 | 276 | 1,380 |
| | 5. Taman Aman | 85 | 338 | 1,690 |
| | 6. Taman Pelentong Baru | 96 | 800 | 4,000 |
| | 7. Taman Kota Putri | 649 | 15,164 | 75,820 |
| | Sub-total | 3,439 | 91,114 | 556,975 |
| within MPJB | APPROVED FOR CONSTRUCTION | | | |
| | 1. Taman Intan | 113 | 2,964 | 14,820 |
| | 2. Taman Tai Hong | 178 | 2,297 | 11,395 |
| | Sub-total | 291 | 5,261 | 26,215 |
| | Total | 3,730 | 96,375 | 593,190 |
| | Housing Schemes pending approval (within & outside MPJB)- 23 schemes | 4,154 | 99,725 | 664,350 |

Source: Johor Town & Country Planning Department (1981)




# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- EXISTING URBAN AREAS
- COMMITTED PROJECTS
- APPLIED PROJECTS UNDER CONSIDERATION

TITLE: URBANISATION TREND

MAP NO. Fig. 3.10

### 3.3.3 Industry

Other major industrial commitments besides the Pasir Gudang industrial estate and free trade zone are:

(i) The partially operative free trade zone (40 ha.) at Senai.

(ii) The industrial site in Bandar Penawar which comprises of about 26 ha. Phase 1 (about 11 ha.) was available for industrial activities in 1977 while development works on the remaining area are being carried out according to demand[5].

### 3.3.4 Institutional

Over 809 ha. in Skudai have been designated for the new Universiti Teknologi Malaysia (UTM) campus. The implication of such a development is that Skudai will eventually emerge as a university town. It is possible that a development of this nature and scale will stimulate the growth of more housing in that vicinity.

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5. Report on the Economic survey of Johor, Development Bank of Malaysia, 1978.

## 4.0 FUTURE DEVELOPMENT TRENDS

### 4.1 Housing Sector

The methodology employed to estimate housing need in the Study Area utilises data from both the Housing Census 1980 and 1970. The estimates and projections of housing need in the Primary Area was based on the Housing Census 1980 while that for the Secondary Area was done on the basis of the 1970 data due to the inavailability of more recent data for the time being. The methodology is outlined in Fig. 4.1

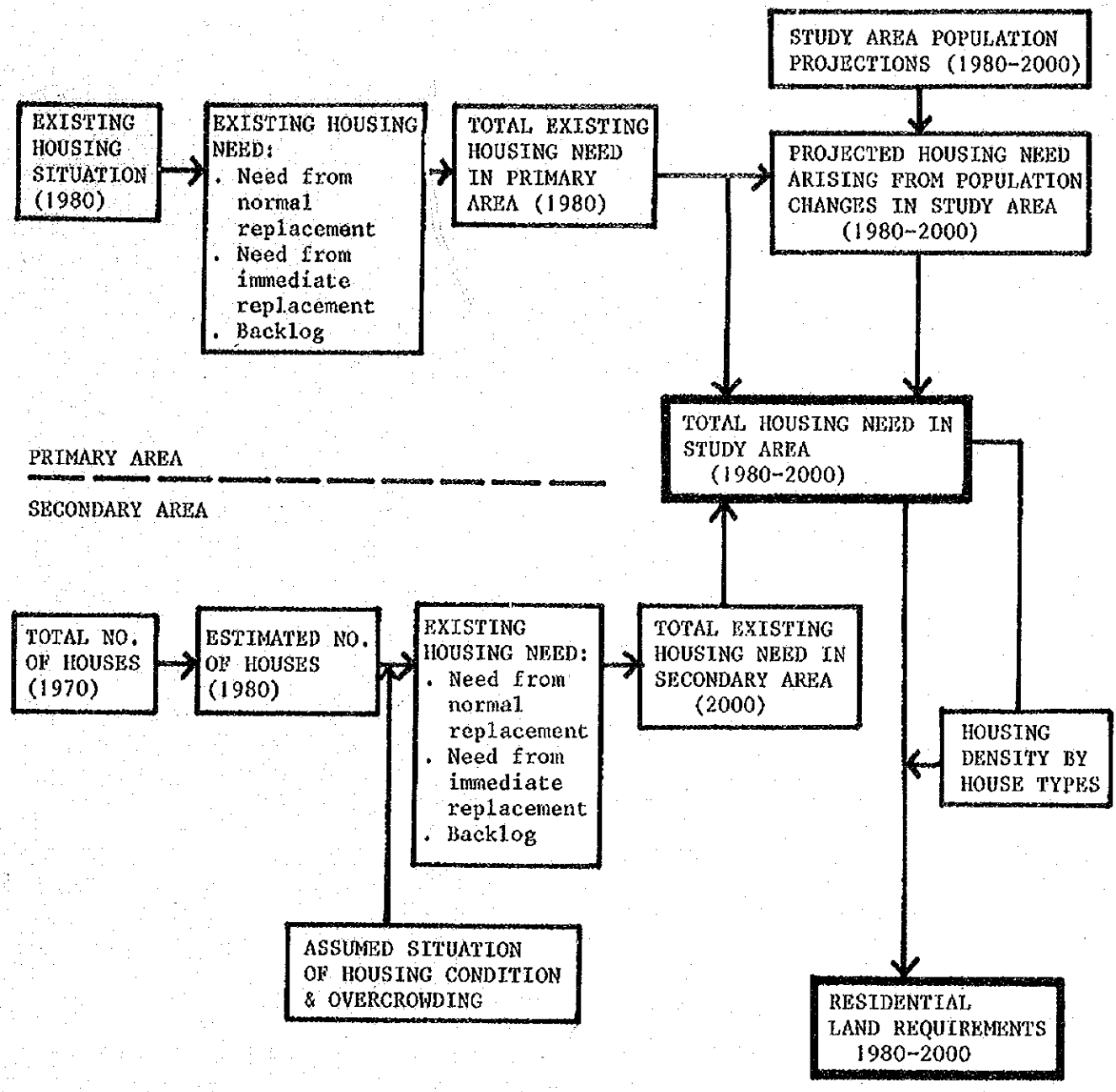



Fig. 4.1 : Methodology for Estimating Housing Need in the Study Area

### 4.1.1 Existing Housing Need in the Primary Area

In 1980, there were 86,123 housing units in the Primary Area, of which more than half were located within the MPJB area. A major proportion of the total housing units were in the form of detached (39%) and terrace (33%) housing unit. Semi-detached units made up 16% while the remaining portion comprised of rooms and flats. (See Table 4.1).

Table 4.1 : Existing Housing In Primary Area (1980)

| Housing Type | No. of Housing Units | % |
|---|---|---|
| Detached | 33,517 | 39 |
| Semi-detached | 13,555 | 16 |
| Terrace | 28,245 | 33 |
| Flat | 5,298 | 6 |
| Shophouse | 4,134 | 5 |
| Others | 1,374 | 1 |
| Total | 86,123 | 100 |

Source : Dept. of Statistics (1981).

Generally the overall housing situation here was satisfactory in that a large majority of the housing units (93%) are in sound condition with only 7% in a deteriorated or dilapidated physical condition. (See Table 4.2). Moreover, density (households per housing unit) was low - 0.92 compared to 1.05 for Peninsular Malaysia.

Table 4.2 .: Housing Condition in Primary Area (1980)

| Condition | No. of Housing Units | % |
|---|---|---|
| Sound | 79,622 | 93 |
| Deteriorated | 5,460 | 6 |
| Dilapidated | 1,041 | 1 |
| Total | 86,123 | 100 |

Source : Dept. of Statistics (1981).

Essentially, the existing housing need comprises of 2 main components:

a) Immediate Replacement of dilapidated housing

There were 1,041 dilapidated houses in the primary area which will have to be replaced immediately.

b) Normal replacement of deteriorated units

The number of housing units requiring replacement as a result of the normal process of deterioration is determined by assuming a normal replacement rate of 2%[1] per annum and applying that to the total housing stock at the beginning of each projection period. Altogether, there will be 4,413 new housing units as result of normal replacement by 2000. (See Table 4.3).

Table 4.3 : Normal Replacement Need for Primary Area

| | 1980 | 1990 |
|---|---|---|
| Housing Stock | 86,123 | 134,572 |
| Normal Replacement (%) | 1,722 | 2,691 |

Source : Study Team Estimates (1981).

1. R. Chander, Housing Needs vs. Housing Demand in Malaysia (1976 - 90).

A brief comparison of housing need in the Primary Area in 1970 - 80 (estimated at approximately 35,000[2]) with the number of houses actually constructed (estimated at 37,000[3]) indicated that housing construction has more than kept up with the need for housing. It would not be incorrect then to assume that no backlog of housing prevails in the Primary Area at the time of the study. Most of the housing constructed here during the last decade has been on the part of the private developer. The public sector has not contributed much to total output; only 12,172 houses or 27% of total Third Malaysia Plan housing committments were implemented in the Primary Area. This portion composes only 33% of the total number of houses constructed in 1970 - 80.[4]

4.1.2 Existing Housing Need in the Secondary Area

The total housing stock in the Secondary Area in 1970 was established at 24,367[5]. Assuming that 80% of total housing requirements in 1970 - 80 was actually constructed, it is estimated that there were 28,080 housing units in the Secondary Study Area in 1980

a) Immediate replacement of dilapidated housing

The Housing Census 1970 classified 6.7% of the total housing stock in 1970 as dilapidated. Since no recent data is available regarding housing condition in the Secondary Area, it is assumed that approximately the same number of houses in 1980, (that is 5.3%) are in similar

2. Study Team Estimates (1981).
3. Housing Census (1970 and 1980).
4. Source : Housing Department, Johor (1981).
5. Housing Census (1970).

condition. Thus, approximately 1,500 houses in the Secondary Area have to be immediately replaced.

b) Normal Replacement

The number of housing units accrueing to normal replacement is estimated as below:

Table 4.4 : Normal Replacement Need for Secondary Area

| | 1980 | 1990 |
|---|---|---|
| Housing Stock | 86,123 | 12,579 |
| Normal Replacement (%) | 1,722 | 2,691 |

Source : Study Team Estimates (1981).

4.1.3 Housing Need from Population Increase in the Study Area

In order to estimate housing need arising from population changes, certain assumptions were made regarding household formations in 1990 and 2000. They are summarised below:

Table 4.5 : Population Increase and Household Formation (1980 - 2000)

| | Total Population | Population increase | Household Size | No. of households per house |
|---|---|---|---|---|
| Primary Area | | | | |
| 1980 | 458,900 | - | 5.2 | 1.05 |
| 1990 | 708,000 | 249,100 | 4.9 | 1.00 |
| 2000 | ,066,900 | 358,900 | 4.0 | 0.95 |
| Secondary Area | | | | |
| 1980 | 160,700 | - | 5.3 | 1.10 |
| 1990 | 220,600 | 59,900 | 5.0 | 1.05 |
| 2000 | 283,500 | 62,900 | 4.0 | 1.00 |
| Study Area | | | | |
| 1980 | 619,600 | - | - | - |
| 1990 | 928,600 | 309,007 | - | - |
| 2000 | 1,350,400 | 421,800 | - | - |

Source : Study Team Estimates (1981), Population Section.

Taking in consideration these assumptions, it is possible to predict housing required to accomodate increases in population in 1980 - 2000.

Table 4.6 : Housing Need from Population Increase (1980 - 2000)

| | | 1980 | 1990 | 2000 |
|---|---|---|---|---|
| Total Population*/ Population increase | Primary Area | 417,400* | 237,800 | 345,200 |
| | Secondary Area | 160,700* | 59,900 | 62,900 |
| Existing housing stock | Primary Area | 86,123 | - | - |
| | Secondary Area | 28,080 | - | - |
| Housing need from existing stock | Primary Area | - | 2,763 | 2,691 |
| | Secondary Area | - | 1,751 | 341 |
| Housing need from Population increase | Primary Area | - | 48,449 | 81,985 |
| | Secondary Area | - | 12,579 | 15,725 |
| Existing Stock*/ Total housing need | Primary Area | 86,123* | 51,212 | 84,676 |
| | Secondary Area | 28,080* | 14,330 | 16,039 |
| | Study Area | 114,203* | 65,542 | 100,715 |

Source : Study Team Estimates (1981).

Table 4.6 indicates that approximately 65,540 and 100,720 houses will be needed in 1990 and 2000 respectively in the entire Study Area. This implies a total housing stock of 179,745 in 1990 and 280,460 in 2000.

Within the Primary Area itself, there exists a housing need of approximately 135,890 units over the next 20 years. However private housing development commitments (approximated to be implemented by 2000) indicate that some 160,000 new houses are likely to be constructed within the same period. (Refer Appendix 4.1 and 4.2). The public sector on the other hand is committed to construct some 8,500 housing units during the Fourth Malaysia Plan, of which 92% are to be built in the Primary Area. (See Table 4.7 & Fig. 3.10).

Table 4.7 Housing Commitments vs. Housing Need (1980-2000)

| | | 1980 - 90[1] | 1990 - 2000[2] |
|---|---|---|---|
| Housing Commitments | Primary Area | 98,972 | 69,430 |
| | Secondary Area | 696 | - |
| | Study Area | 99,668 | 69,430 |
| Housing Need | Primary Area | 51,212 | 84,676 |
| | Secondary Area | 14,330 | 16,039 |
| | Study Area | 65,542 | 100,715 |

Source : Study Team Estimates (1981).

(1) These refer to housing schemes currently under various stages of construction.

(2) These refer to schemes already approved or partially approved for construction. It is assumed that their full implementation will occur in 1990 - 2000.

The information in Table 4.7 implies that the Study Area's housing need over the following 20 years is likely to be accomodated judging from current housing development trends. In fact the initial 10 year period foresees an 'oversupply' of housing. However, it is expected that the supply of housing will eventually be phased over into the 1990's by the operation of market forces.

### 4.1.4 Residential Land Requirements

Residential land requirements for the Study Area were calculated by taking into account the projected household income distribution[6] in relation to house-types and their related land requirements (See Table 4.8).

Table 4.8 : Residential Land Requirements (1990 & 2000)

| | Housing Density[2] (Units/ Ha.) | Housing Need (1980-90) | | Land Requirement (1980-1990) (Ha.) | Housing Need (1990-2000) | | Land Requirement (1990-2000) (Ha.) | Residential Land Requirement (1980-2000) (Ha.) |
|---|---|---|---|---|---|---|---|---|
| | | % | No. | | % | No. | | |
| Low Cost Housing ( $500) | 50 | 40 | 26,217 | 524 | 64 | 64,005 | 1,280 | 1,804 |
| Medium Cost Housing ($501-$1,000) | 20 | 54 | 35,393 | 1,770 | 26 | 26,638 | 1,332 | 3,102 |
| High Cost Housing ( $1,000) | 10 | 6 | 3,932 | 393 | 10 | 10,072 | 1,007 | 1,400 |
| Total | - | 100 | 65,542 | 2,687 | 100 | 100,715 | 3,619 | 6,306 |

Source : (1) Study Team Estimates (1981).
(2) Planning Standards, Federal Town & Country Planning Dept. (1981).

Applying the standard housing density to the estimated number of houses by types, the amount of land required for each housing type was calculated. In 1990, over 2,600 ha. of land will be needed to accomodate the housing need of 65,542 houses while over 3,600 ha. more will be required in 2000. The total land requirement for residential use during 1980-2000 will be expected to be approximately 6,300 ha.

6. Study Team Estimates (1981), Economic Analysis Report.

Finally, residential land distribution pattern is shown in Table 4.9 which displays total residential land and the increment by 2000. The distribution pattern put high-light on Johor Bahru district within the area.

Table 4.9 Residential Land Distribution (1980 - 2000)

| | | Total Land (ha) | | | Increment (ha) | |
|---|---|---|---|---|---|---|
| | | 1980 | 1990 | 2000 | 1980 - 90 | 1980 - 2000 |
| PRIMARY AREA | JOHOR BAHRU | | | | | |
| | MPJB | 3,215 | 4,444 | 5,673 | 1,229 | 2,458 |
| | Plentong | 1,398 | 2,029 | 2,660 | 631 | 1,262 |
| | Senai - Kulai | 670 | 776 | 982 | 106 | 312 |
| | Other Area | 1,279 | 1,617 | 1,956 | 338 | 677 |
| | Sub Total | 6,562 | 8,866 | 11,271 | 2,304 | 4,709 |
| | KOTA TINGGI | | | | | |
| | Kota Tinggi | 277 | 433 | 590 | 156 | 313 |
| | Others | 24 | 47 | 71 | 23 | 47 |
| | Sub Total | 301 | 481 | 661 | 180 | 360 |
| | Total | 6,863 | 9,397 | 11,932 | 2,534 | 5,069 |
| SECONDARY AREA | PONTIAN | | | | | |
| | Pontian Kecil | 100 | 403 | 707 | 303 | 607 |
| | Others | 398 | 571 | 745 | 173 | 347 |
| | Sub Total | 498 | 974 | 1,452 | 476 | 954 |
| | Tanjong Penggerang | 820 | 962 | 1,103 | 142 | 283 |
| | Total | 1,318 | 1,936 | 2,555 | 618 | 1,237 |
| | Study Area Grand Total | 8,181 | 11,333 | 14,487 | 3,152 | 6,306 |

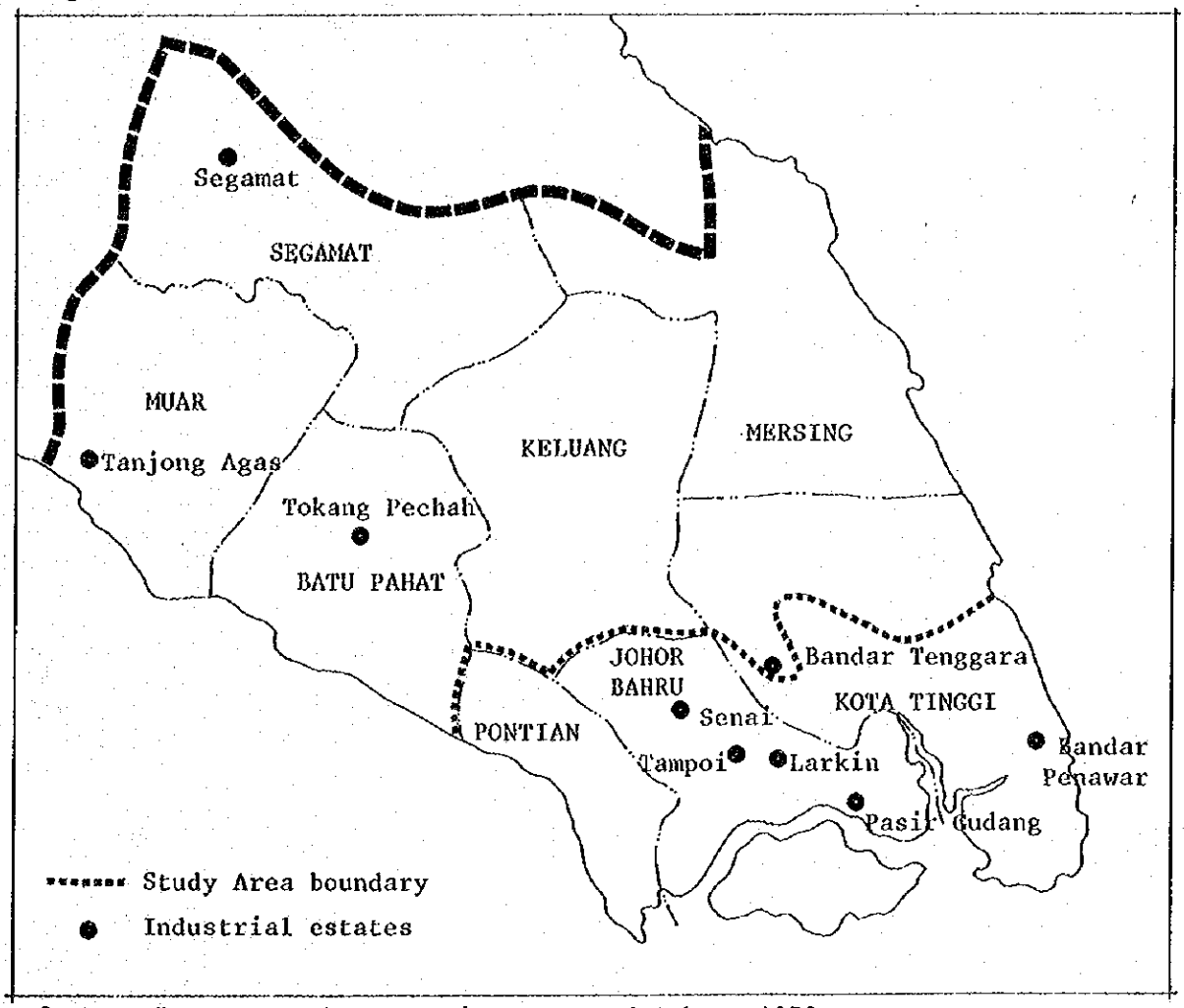
SOURCE: THE STUDY TEAM ESTIMATE, 1981

## 4.2 THE INDUSTRIAL SECTOR

### 4.2.1. An Overview Of Existing Industrial Development

Broadly, the long-term policy of the State Government is to provide at least one industrial estate in every district in its effort to encourage the dispersal of industries to less developed areas so as to ensure a more orderly industrial development in line with the New Economic Policy.

Fig. 4.2 : Industrial Estates in Johor




Source: Report on the Economic Survey of Johor, 1978.

Table 4.10 : Industrial Estates/Areas Within and Outside Study Area

| | | Existing Developed Area (Ha.) | Target Area (Ha.) |
|---|---|---|---|
| Study Area | | | |
| Tampoi and Larkin | Industrial Estates | 159 | 159 |
| Pasir Gudang | Industrial Estates | 376 | 930 |
| Senai | Industrial Estates | 24 | 40 |
| Bandar Penawar | Industrial Estates | 11 | 26 |
| Johor Bahru District | Dispersed Industries | 60 | - |
| Pontian District | Dispersed Industries | n.a. | - |
| Kota Tinggi District | Dispersed Industries | n.a. | - |
| Sub-Total for Industrial Estates | | 570 | 1,155 |
| Outside Study Area | | | |
| Segamat | | 25 | 25 |
| Tanjung Agas | | 35 | 97 |
| Tokang Pechah | | 15 | 15 |
| Parit Raja | | - | 38 |
| Sru Gading | | - | 31 |
| Sub-Total | | 75 | 256 |
| Total | | 645 | 1,411 |

Sources : (1) South Johor Regional Study (1974)
(2) Economic Survey of Johor (1978)
(3) Johor Barat Physical Planning Study (1980)
(4) Study Team Estimates (1981)

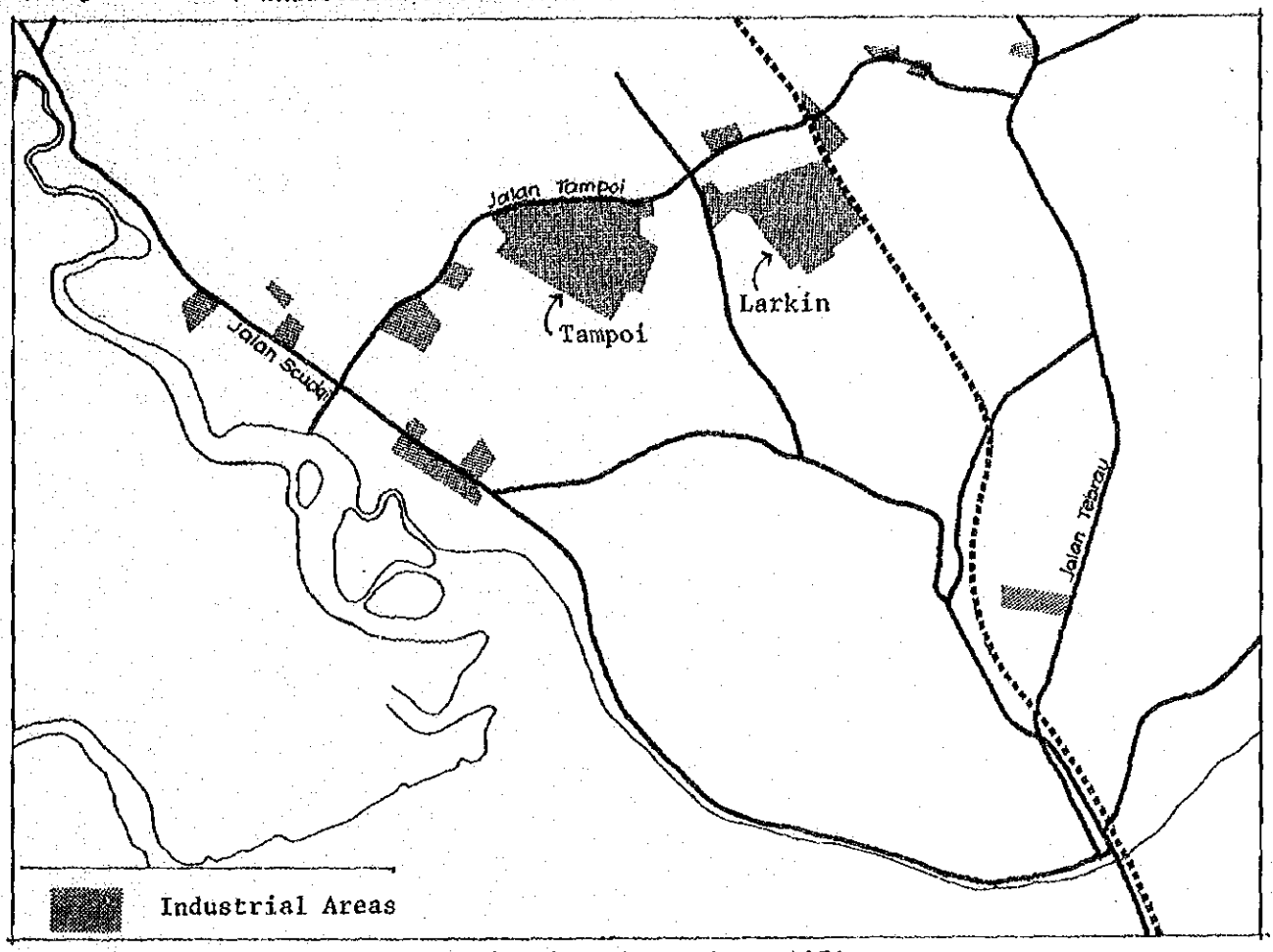
A study of applications for industrial sites at Pasir Gudang indicated that the industrial estate there was mainly attracting heavy industry with an average density of 74 persons per ha. On the other hand, light industries prevail on existing industrial estates in Johor Bahru where the density is 79 persons per ha[7].

7. A report on Industries in Johor Bahru (1971).

In the past, the tendency has been to locate industrial estates within the district of Johor Bahru by reason of location advantages available. These comprise of the industrial estates at Tampoi, Larkin and more recently, Senai and Pasir Gudang. Outside of this district, industrial sites are to be found at Bandar Tenggara and Bandar Penawar apart from those in Segamat, Tanjong Agas and Tokang Pechah. The industrial estates in Tampoi and Larkin are fully taken up while the remaining sites are still at various stage of implementation. (See Table 4.10 and Fig. 4.3)

Other than the industrial estates mentioned within the Study Area, dispersed industries (defined as those not located within industrial estates) are found along Jalan Abdullah Tahir, Jalan Tampoi and Jalan Skudai in Johor Bahru town. These areas make up 80 ha. It is estimated that there are approximately 70 such industrial establishments in the Districts Pontian and Kota Tinggi, employing some 1,800 people. The industrial establishments in these 2 districts comprise primarily of furniture-making, manufacture of fixture products and food-manufacturing. Current industrial policy in the State is to channel all new industries and possibly existing dispersed industries into industrial estates with the exception of agro-based industries.

Fig. 4.3 : Industrial Areas in Johor Bahru




Source: A Report on Industries in Johor Bahru, 1971.

4.2.2 The Growth of the Industrial Sector

The growth of the manufacturing subsector and of industrialisation in general, has been one of the most effective means of accelerating the rate of economic growth. In 1980 it contributed $679 million (or 24%) of total GRP in comparison to longer established sectors like agriculture (33%) and services (39%); and this despite its low base. In terms of total employment, 77,000 persons (or 15%) of the total population in Johor were involved in the industrial sector.

Within the Study Area itself, industrial employment is estimated to increase at a rate of about 5,000 jobs a year between the period 1980 - 90. In 1980, there

were 58,501 industrial workers, 90% of whom were in the manufacturing subsector and the remainder were in agro-processing industries. (See Table 4.11)

Table 4.11 : Industrial Employment (1970 - 2000)

| | 1970 | 1980 | 1990 | 2000 | Growth rate (%) | | |
|---|---|---|---|---|---|---|---|
| | | | | | 1970-80 | 1980-90 | 1990-2000 |
| Target estimates based on productivety assumption | 18,777 | 50,985 | 107,184 | 184,122 | 10.5 | 7.7 | 5.6 |
| Estimate based on | | | | | | | |
| demand - manufacturing | - | 53,196 | 103,880 | 169,210 | - | 6.9 | 5.0 |
| - agro-processing | - | 5,305 | 5,565 | 5,755 | - | 0.5 | 0.3 |
| - Total | 18,777 | 58,501 | 109,445 | 174,965 | 11.8 | 6.5 | 4.9 |

Source : Study Team Estimates (1981), employment section

Based on demand trends, it is estimated that some 51,000 industrial jobs will be available during the period 1980 - 90 implying a total of 109,445 industrial workers by 1990. The number is expected to swell to 174,965 by 2000. The increase is accrued mainly to the growth of the manufacturing subsector.

### 4.2.3 Industrial Land Requirements

The industrial land requirements refer solely to land for manufacturing industries. It is not necessary to estimate land requirements for agro-processing industries as these are usually already accounted for within agricultural schemes.

The industrial sites at Pasir Gudang, Senai and Bandar Penawar still have an areal capacity of 585 ha., 90% of which in within the Pasir Gudang Complex. These are expected to be fully implemented by 1990 (See Table 4.12)

Table 4.12 Manufacturing Industrial Area and Employment (1980-90)

| Industrial Estate | Available industrial area (Ha.) | Employment created | Pop/m |
|---|---|---|---|
| Pasir Gudang General Industry | 522 | 39,150 | 75.0 |
| Pasir Gudang Free Trade Zone | 32 | 4,000 | 125.0 |
| Senai | 16 | 2,000 | 125.0 |
| Bandar Penawar | 15 | 1,125 | 75.0 |

Source : Study Team Estimates (1981).

After 1980, some 1,700 ha. of industrial land will be required to accomodate formulation of new industries. This implies a total of 2,496 ha. of industrial land in the Study Area by 2000 being shared 2,150 ha. or 86% of the total in Johor Bahru district. Pasir Gudang industrial development and MPJB development mainly contribute to such a drastic increase of the area. (See Table 4.13).

The concentration of so much industry in a limited area holds many implications in terms of transport and urban development.

Table 4.13 : Industrial Land Distribution (1980 - 2000)

| | | | Total Land | | | Increment (ha) | |
|---|---|---|---|---|---|---|---|
| | | | 1980 (ha) | 1990 (ha) | 2000 (ha) | 1980 - 90 | 1980 - 2000 |
| Primary Area | Johor Bahru | MPJB | 408 | 641 | 873 | 233 | 465 |
| | | Plentong | 239 | 584 | 928 | 345 | 689 |
| | | Senai - Kulai | 61 | 110 | 159 | 49 | 98 |
| | | Other Area | 14 | 102 | 190 | 88 | 176 |
| | | Sub Total | 722 | 1,437 | 2,150 | 715 | 1,428 |
| | Kota Tinggi | Kota Tinggi | 10 | 20 | 30 | 10 | 20 |
| | | Others | 5 | 12 | 18 | 7 | 13 |
| | | Sub Total | 15 | 32 | 48 | 17 | 33 |
| | | Total | 737 | 1,469 | 2,200 | 732 | 1,463 |
| Secondary | Pontian | Pontian Kecil | 30 | 61 | 91 | 31 | 61 |
| | | Others | 53 | 107 | 161 | 54 | 108 |
| | | Sub Total | 83 | 168 | 252 | 85 | 169 |
| | | Tanjong Penggerang | 20 | 32 | 44 | 12 | 24 |
| | | Total | 103 | 200 | 296 | 97 | 193 |
| Study Area Grand Total | | | 840 | 1,669 | 2,496 | 829 | 1,656 |

Source : The Study Team Estimate (1981).

## 4.3 The Commercial Sector

### 4.3.1. Johor Bahru in the Urban Hierarchy

Apart from its status as the State Capital, Johor Bahru is by far, the most important town in the southern half of Peninsular Malaysia. Nevertheless, the position of Johor Bahru within the national hierarchy of urban centres[8] in 1970 assumed an apparent ambiguity in that it could either be regarded as a regional centre (Grade II) or a sub-regional centre (Grade III); its variety of services 'overqualifies' it for a Grade III centre, yet at the same time, the variety of these services were too narrow for it to be placed as a Grade II centre (See Table 4.14)

Table 4.14 ; Hierarchy Of Urban Centres

| Suggested Grade | Town | 1970 Pop. | Score |
|---|---|---|---|
| I National Centre | Kuala Lumpur | 452,000 | 104 |
| II Regional Centres | Penang | 331,000 | 80 |
| | Ipoh | 248,000 | 78 |
| IIa | Johor Bahru | 136,000 | 53 |
| IIb | Petaling Jaya | 93,000 | 43 |
| III Subregional Centres | Melaka | 86,000 | 38 |
| | Seremban | 80,000 | 36 |
| | Alor Star | 66,000 | 35 |
| | Kuantan | 43,000 | 34 |
| | Kota Bahru | 55,000 | 33 |
| | Kelang | 113,000 | 30 |
| | Batu Pahat | 53,000 | 29 |
| | Taiping | 55,000 | 29 |

Source: South Johor Regional Study, 1974

8. The South Johor Regional Study Team in 1974 analysed the relative importance (as service centres) of the principal towns in Peninsular Malaysia on the basis of an inventory of services.

In view of its enigmatic score of 25 points below Ipoh and 15 points above Malacca, Johor Bahru may be regarded either as a Grade III subregional centre with an unusually wide range of services or a Grade II regional centre with a significantly smaller variety of services than prerequisite for towns within this group. In view of the Government's investment in the region, the latter interpretation was more likely.

The cause for Johor Bahru's situation in the urban hierarchy was largely attributed to the proximity of Singapore; many Grade II services have traditionally been provided by Singapore. In fact, a 100% commercial establishment survey conducted in February, 1974[9] estimated that most households spent 10% to 11% of their monthly income in Singapore.

However, the time span between the South Johor Regional Study and this study should be taken into account. Within the past ten years or so, increased Government spending in the form of industrial estates, the creation of a seaport at Pasir Gudang and an airport at Senai and various regional land development schemes has provided a stimulating climate for growth in the Primary Study Area, especially so in Johor Bahru. Commercial floorspace in Johor Bahru increased from 4.5 million sq. ft. in 1970 to 7.0 million sq. ft. in 1978 (See Table 4.15). However, almost 10% of this total floorspace were either vacant or in the process of construction.

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9. The survey conducted by the South Johor Regional Study Team covered all types of commercial establishments except those offering convenience goods and services.

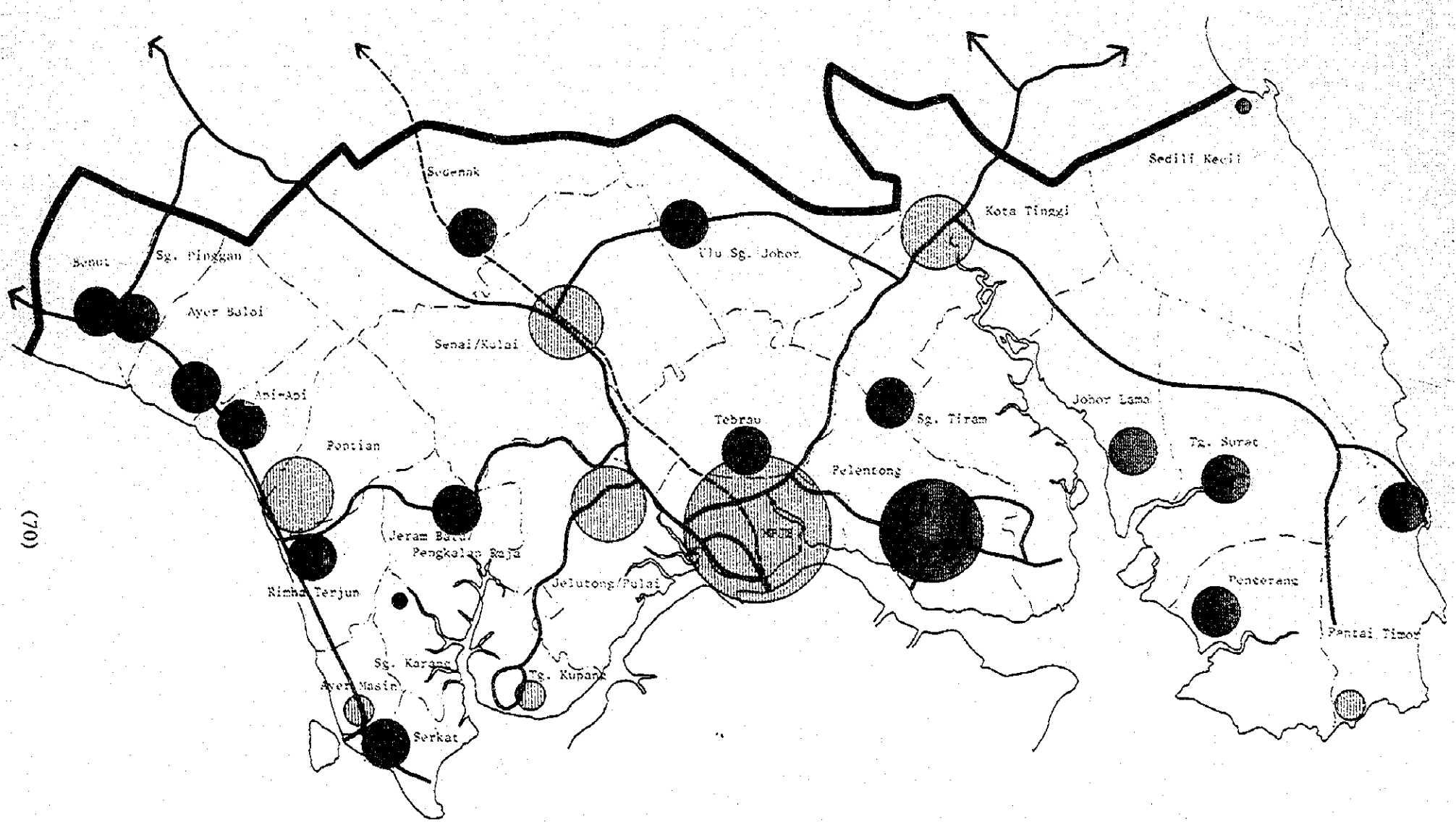
Table 4.15 : Commercial Floorspace Distribution in Johor Bahru

| | Type of Commercial | Total | | % of Total | |
|---|---|---|---|---|---|
| | | No. of Estab. | Area (sq.ft.) | No. of Estab. | Area (sq.ft.) |
| 1. | Offices and Administration | 382 | 810,164 | 7.72 | 11.55 |
| 2. | Light Retailing | 504 | 581,244 | 10.19 | 8.29 |
| 3. | Heavy Retailing | 468 | 639,491 | 9.46 | 9.12 |
| 4. | Accommodation | 1,527 | 2,110,929 | 30.03 | 30.11 |
| 5. | Services | 941 | 1,242,980 | 19.03 | 17.73 |
| 6. | Storage | 129 | 170,682 | 2.61 | 2.43 |
| 7. | Light Industry | 257 | 340,368 | 5.20 | 4.86 |
| 8. | Vacant | 477 | 698,791 | 9.64 | 9.97 |
| 9. | Recreation | 82 | 144,621 | 1.66 | 2.06 |
| 10. | Miscellaneous | 179 | 272,238 | 3.62 | 3.88 |
| | Total | 4,946 | 7,011,508 | 100.00 | 100.00 |

Sources: Commercial Establishment Survey in MPJB (1978)

With the exception of office space, the increase in both shopping and wholesale floorspace far exceeded that projected by the South Johor Study. Generally, it can be observed that the increase in commercial floorspace has been quite recent; during the past few years several high-rise shopping-cum-office-cum-hotel complexes in the like of the Complex Tun Abdul Razak, Merlin Tower and Tropical Inn have been constructed, and at a smaller scale, medium-rise office blocks, eg., the Bangunan MIC, PERKIM, MARA, Dewan Perniagaan, Kuok Brothers, Tabung Haji, etc.

The commercial land use in the MPJB area in 1978 indicated a high proportion (30%) of accomodation uses (but this comprised hotels and private residential atop shop units), service, retail and office uses. While the bulk (55%) of service and office space was found in the CBD area, retail trade was more evenly distributed throughout the MPJB area; retail shops were found in considerable numbers in Tampoi, Century Gardens and Taman Sri Tebrau.




(70)

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

LEGEND

- More than 500,000 persons
- 100,000-500,000 persons
- 50,000-100,000 persons
- 10,000-50,000 persons
- 5,000-10,000 persons
- less than 5,000 persons

TITLE

POPULATION HIERARCHY BY MUKIMS 2000

MAP NO.

Fig. 4.4

Light industries made up 5% of total commercial floorspace while 10% was vacant. (See Table 4.16)

Table 4.16 : Existing Commercial Land Use in MPJB

| | Johor Bahru (CBD) ('000sq.ft) | Tampoi ('000sq.ft) | Century Garden ('000sq.ft) | Taman Sri Tebrau ('000sq.ft) | Other Area in MPJB('000sq.ft) | Total MPJB Area '000sq.ft | (%) |
|---|---|---|---|---|---|---|---|
| Offices & Administration | 486.5 | 0.8 | 82.3 | 45.8 | 194.8 | 810.2 | 12 |
| Retaling | 356.0 | 109.3 | 142.3 | 206.3 | 406.8 | 1,220.7 | 17 |
| Services | 564.3 | 60.8 | 103.2 | 192.2 | 322.5 | 1,243.0 | 18 |
| Accomodation | 702.2 | 63.8 | 42.6 | 238.7 | 1,063.6 | 2,110.9 | 30 |
| Light Industry | 47.8 | 25.6 | 48.0 | 44.3 | 174.7 | 340.4 | 5 |
| Storage | 59.0 | 6.2 | 14.9 | 28.2 | 62.4 | 170.7 | 2 |
| Miscellaneous | 257.8 | 12.0 | 15.4 | 45.8 | 85.9 | 416.9 | 6 |
| Vacant | 184.8 | 62.4 | 6.4 | 4.2 | 441.0 | 698.8 | 10 |
| Total | 2,658.4 | 340.9 | 455.1 | 805.5 | 2,751.7 | 7,011.6 | 100 |

Source: Commercial Establishment Survey in MPJB (1978)

Definitely, the variety of services found in Johor Bahru is much greater now than 10 years ago. For one thing, commercial areas have increased in number as evident in the local centres of Century Garden and Taman Sri Tebrau. The implication here is that the services located in Johor Bahru may be of sufficient number and variety for it to be regarded as a regional centre, within the same category as Ipoh. Unfortunately, the constraints of time and manpower does not permit the Study Team to carry out a desk survey similar to that of the South Johor Regional Study so as to confirm definitely the present position of Johor Bahru in the national hierarchy of urban centres.

### 4.3.2 Other Major Commercial Centres

Apart from Johor Bahru, the other more prominant commercial centres in the Study Area are Pontian Kecil, Kulai , Pekan Nenas and Kota Tinggi. With the exception of Pontian Kecil (which is the district centre for Pontian District), the commercial functions of these towns cater primarily to the daily requirements of the residents in the form of sundry goods and general services such as motor repairs, tailoring and hairdressing. It is estimated that these four towns contain a total of approximately 160,000 square metres of commercial floorarea which is only a quarter that of Johor Bahru (See Table 4.17).

Table 4.17 : Commercial Floorspace in Other Major Centres (1980)

| | Population | Commercial Floorspace ('000 sq.ft) | Converted Floorspace (x 1000 $m^2$) |
|---|---|---|---|
| Pontian Kecil[2] | 12,150 | 485 | 45 |
| Kulai[2] | 24,200 | 722 | 67 |
| Pekan Nenas[2] | 10,430 | 217 | 20 |
| Kota Tinggi[3] | 11,050 | 300 | 28 |
| Total | 57,830 | 1,724 | 160 |
| Johor Bahru[1] | 247,000 | 7,011 | 652 |

Source: 1. Commercial Survey in MPJB (1978)
2. Johor Barat Physical Planning Study (1980)
3. Study Team Estimates (1981)

Pontian Kecil provides goods and services of a higher order such as jewellery shops, private medical clinics and a supermarket, evident in its relatively

higher commercial floorspace[10]. Kota Tinggi despite being the centre for Kota Tinggi District, has yet to assume the level of urban functions as that of Pontian. Nevertheless, it is observed to be a thriving town. Recent development impetus is attributed mainly to its location at the threshold to major tourist attractions such as the Kota Tinggi waterfalls and the Tanjong Penawar resort. Although no recent data is available, it is most likely that households in these and other minor towns commute to Johore Bahru and Singapore for higher-order goods and services[11].

### 4.3.3 Commercial Floorspace Requirements

Essentially, the commercial floorspace requirements for the Study Area are estimated using 2 methods:

(a) the correlation of commercial establishments floorarea to town size, for retail, services and wholesale floorspace.

(b) estimates of the future number of office workers and floorspace per worker.

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10. The South Johor Regional Study estimated the catchment area for Johor Bahru to be the most of Johor State, excepting the districts of Muar and Segamat; the latter two are approximated to lie within the catchment of Malacca town. Thus, the Study Area is entirely within the catchment area of Johor Bahru. However, the Household Interview Survey (1974) conducted by the same Team established that Pontian Kechil households spent only 6% to their household income in Johor Bahru in contrast to households in other towns who spent 21% of their income in Johor Bahru on average.

11. Sources: 1. L.M. Lee and A.H. Lee, Planning Standards for the Design of Urban Settlements, USM (1980), (Unpublished Report).
2. Commercial Establishment Survey (1978), Johor Barat Physical Planning Study.

Fig 4.18 : Distribution of Commercial Land (1980 - 2000)

| | | | Floor Space (1000 $m^2$) | | Total Land Use (ha) | | | Increment (ha) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1980 | 2000 | 1980 | 1990 | 2000 | 1980-90 | 1990-2000 |
| Primary Area | Johor Bahru | MPJB | 652 | 1,760.3 | 266 | 397 | 528 | 131 | 262 |
| | | Plentong | 27.7 | 489.4 | 11 | 79 | 147 | 68 | 136 |
| | | Senai - Kulai | 86.8 | 186.8 | 36 | 46 | 56 | 10 | 20 |
| | | Other Area | 48.9 | 114.4 | 20 | 27 | 34 | 7 | 14 |
| | | Sub Total | 784.8 | 2550,9 | 333 | 549 | 769 | 216 | 432 |
| | Kota Tinggi | Kota Tinggi | 21.8 | 53.5 | 9 | 12 | 16 | 3 | 7 |
| | | Others | 9.4 | 22.9 | 4 | 5 | 7 | 1 | 3 |
| | | Sub Total | 31.2 | 76.4 | 13 | 18 | 23 | 5 | 10 |
| | Total | | 816 | 2,627.3 | 346 | 567 | 788 | 221 | 442 |
| Secondary Area | Pontian | Pontian Kecil | 37.4 | 107.0 | 15 | 23 | 32 | 8 | 17 |
| | | Others | 87.3 | 249.8 | 36 | 55 | 75 | 19 | 39 |
| | | Sub Total | 124.7 | 356.8 | 51 | 79 | 107 | 28 | 56 |
| | Tanjong Penggerang | | 22 | 76.0 | 9 | 16 | 23 | 7 | 14 |
| | Total | | 146.8 | 432.8 | 60 | 95 | 130 | 35 | 70 |
| Study Area Grand Total | | | 962.8 | 3,060.1 | 406 | 662 | 918 | 256 | 512 |

SOURCES: THE STUDY TEAM ESTIMATE (1981)

The overall distributions of commercial floorspace in 1980, 1990 and 2000 are shown in Table 4.18. The share of commercial floorspace in the major towns in 1980 amounted to over 80% of a total of approximately 963,000 $m^2$. and the remaining 20% were located in the rural areas. MPJB commanded 652,000 $m^2$. or 68% of total commercial floorspace.

The projection of commercial floorspace required in 2000 show demand for 30.6 million $m^2$. This implies that 21.0 million $m^2$. of new commercial floorspace will be required by 2000. The new increases are still attributed mainly to Johor Bahru rather than the other major town. Conversion of floorspace to landuse shows that the latter's share of commercial landuse is anticipated to decline from 60.0% to 57.5% during the period 1990 - 2000.

On the other hand, government investments in Pasir Gudang and Bandar Penawar are expected to stimulate Commercial developments in these two towns. It is estimated that the share of commercial floorspace in Plentong will increase from 2.9% to 16.0% over the next 20 years while that for Tanjong Penggerang will rise from 2.3% to 14.0%.

Local commercial units within new housing schemes in the vicinities of the corridor area (Kulai-Johor Bahru-Pasir Gudang) are also expected to contribute significantly to total commercial floorspace (See Table 4.19). Within Johor Bahru itself, the sub-centres at Taman Century and Taman Sri Tebrau are still progressing. Other new sub-centre developments include those proposed at Taman Permas Jaya, the UDA scheme at Tampoi , Taman Tun Aminah and Taman Kota Putri. These together with proposed commercial units in other new housing schemes will provide over 1.4 million square metres of commercial space in the near future. Of this, 0.87 million square metres are to be provided in areas outside of MPJB; the proposed commercial developments represent 69% of total new retail/services/office floorspace required in the Study Area by 2000. Although these projects are expected to be fully completed by the same year, it is likely that an overprovision of floorspace is inevitable if commercial investments continue at present rates. It may thus be necessary to consider steps to divert investment into other channels, eg. manufacturing and recreation.

It is not possible to compare the estimates of demand for additional floorspace in Johor Bahru with projects which are under construction or which have been approved as the list of committed

commercial developments in Johor Bahru is incomplete. However, 3 major hotels/office/shopping complexes have been identified other than the commercial units within housing schemes. These complex developments comprise of Holiday Inn hotel-cum-shopping complex, Merlin Inn and a high-rise office block.

Table 4.19 : Committed Commercial Development within Housing Schemes

| Development Schemes | | Commercial Floorspace ($m^2$) |
|---|---|---|
| UDA Schemes | Within MPJB | 58,434 |
| SEDC Schemes | | 43,825 |
| Taman Sentosa | | 63,303 |
| Taman Permas Jaya | | 181,317 |
| Taman Intan | | 100,397 |
| Taman Tai Hong | | 128,898 |
| Sub-Total | | 576,174 |
| Taman Skudai | Outside MPJB | 67,027 |
| Taman Tun Aminah | | 274,123 |
| Pasir Gudang | | 321,780* |
| Taman Dawani | | 6,015 |
| Taman Aman | | 17,759 |
| Taman Pelentong Baru | | 42,536 |
| Taman Kota Putri | | 141,645 |
| Sub-Total | | 870,885 |
| TOTAL | | |

Source : Johor Town & Country Planning Dept. (1981)

* Study Team Estimates (1981)

## 4.4 Summary of Urban Land Requirement By 2000

The urban landuse requirement by major sectors; residential land, commercial land, industrial land and the others; estimated in the study is summarized in Table 4.20. It is anticipated that the three major landuses gradually increase its share in total while other urban land will decrease mainly because it is anticipated that it will realize higher development density in the future urban area.

Table : 4-20 Summary of Urban Land Requirement by 2000

| | 1980 | 1990 | | 2000 | |
|---|---|---|---|---|---|
| | Total Area (ha) | Total Area (ha) | Increment 1980 - 1990 (ha) | Total Area (ha) | Increment 1990 - 2000 (ha) |
| Residential Land | 8,181 (52.5) | 11,333 (53.7) | 3,152 | 14,487 (54.5) | 6,306 |
| Industrial Land | 840 (5.4) | 1,669 (7.9) | 829 | 2,496 (9.4) | 1,656 |
| Commercial Land | 406 (2.6) | 662 (3.1) | 256 | 918 (3.5) | 512 |
| Other Urban Land; Roads, Parks, Institutions, etc. | 6,150 (39.5) | 7,447 (35.3) | 1,303 | 8,684 (32.6) | 2,540 |
| Urban Total | 15,577 (100) | 21,111 (100) | 5,540 | 26,585 (100) | 11,014 |

Source : The Study Team Estimate - (1981).

## 4.5 Agricultural Sector 4.5.1 The Cropping Subsector

### (a) Cropping Pattern

In the Study Area, 280,283 ha. or 60% of the land surface was under cultivation in 1980. There has been a rapid increase since the late sixties in cultivated area; over the past 15 years, the increase in area under cultivation averaged approximately 7,000 ha. per year. Out of the 280,283 ha. under cultivation, about 251,600 ha., or 90% of the cultivated area is under tree crops. The principal tree crops are rubber, oil palm and coconut with a smaller area under fruit trees (See Table 4.21). As such, the cropping pattern of the Study Area is reflective of the Malaysian agricultural sector which is export-oriented. While rubber still leads in terms of cultivated area, its dominance is fast being eroded by the increase in oil palm cultivation. Rubber occupies 43% of the cultivated land followed by 40% of oil palm. (Also refer to Existing Regional Land Use Map - 1980).

Table 4.21: Cropped Areas in the Study Area - 1980, 1974, 1966 (Ha.)

| | Total Cultivated area | Rubber | Oil Palm | Coconut | Market-gardening & other crops |
|---|---|---|---|---|---|
| Pontian | 113,733 | 29,677 | 3,267 | 16,855 | 14,237 |
| Johor Bahru | 64,036 | 69,054 | 40,324 | 870 | 3,485 |
| Kota Tinggi area | 102,514 | 20,875 | 69,224 | 1,490 | 10,925 |
| Study Area 1980 | 280,283 | 119,606 | 112,815 | 19,215 | 28,647 |
| 1974 | 241,192 | 137,940 | 56,088 | 16,397 | 30,767 |
| 1966 | 183,304 | 137,144 | 12,360 | 10,759 | 23,042 |

Sources: 1. Department of Agriculture, Johor Annual Report (1980)
2. I.F.T. Wong, Present Land Use of Peninsular Malaysia (1974 & 1966)

The previous table indicates that the only significant increase in agricultural land area in the Study Area has been in the Government agency-operated subsector. Agricultural land operated by Government agencies increased from 26% to 37% within a period of 3 years. New agricultural development in the Study Area has occured mainly in the Kota Tinggi district. Part of the Johor Tenggara Regional Development Scheme (hereafter referred to as Tanjong Penggerang) is located within the Study Area. The Scheme has opened up over 42,000 ha. of land for agricultural development within the Kota Tinggi District. The estate subsector on the other hand, has only increased by more than 1000 ha. within the same time frame while the private smallholding sub-sector has actually decreased by nearly 8,000 ha.

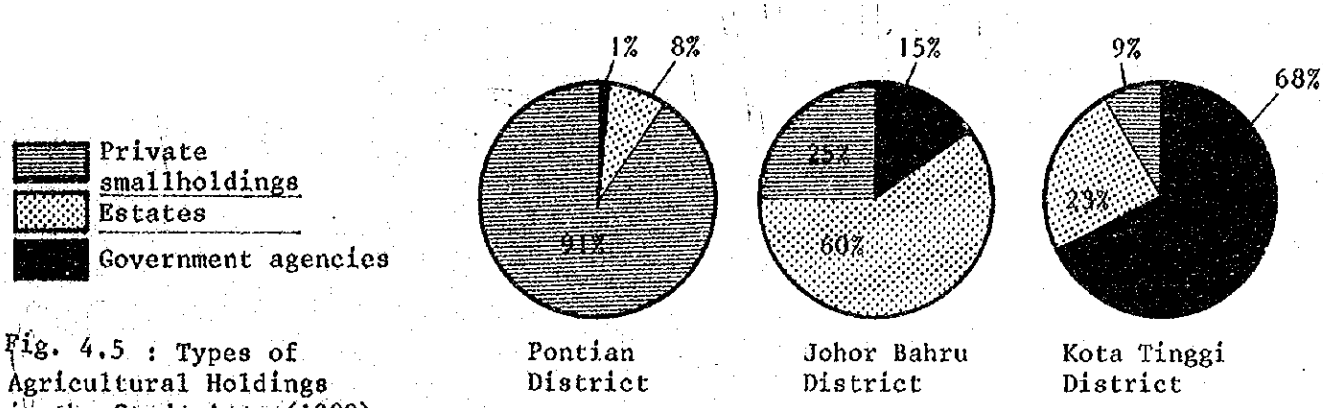
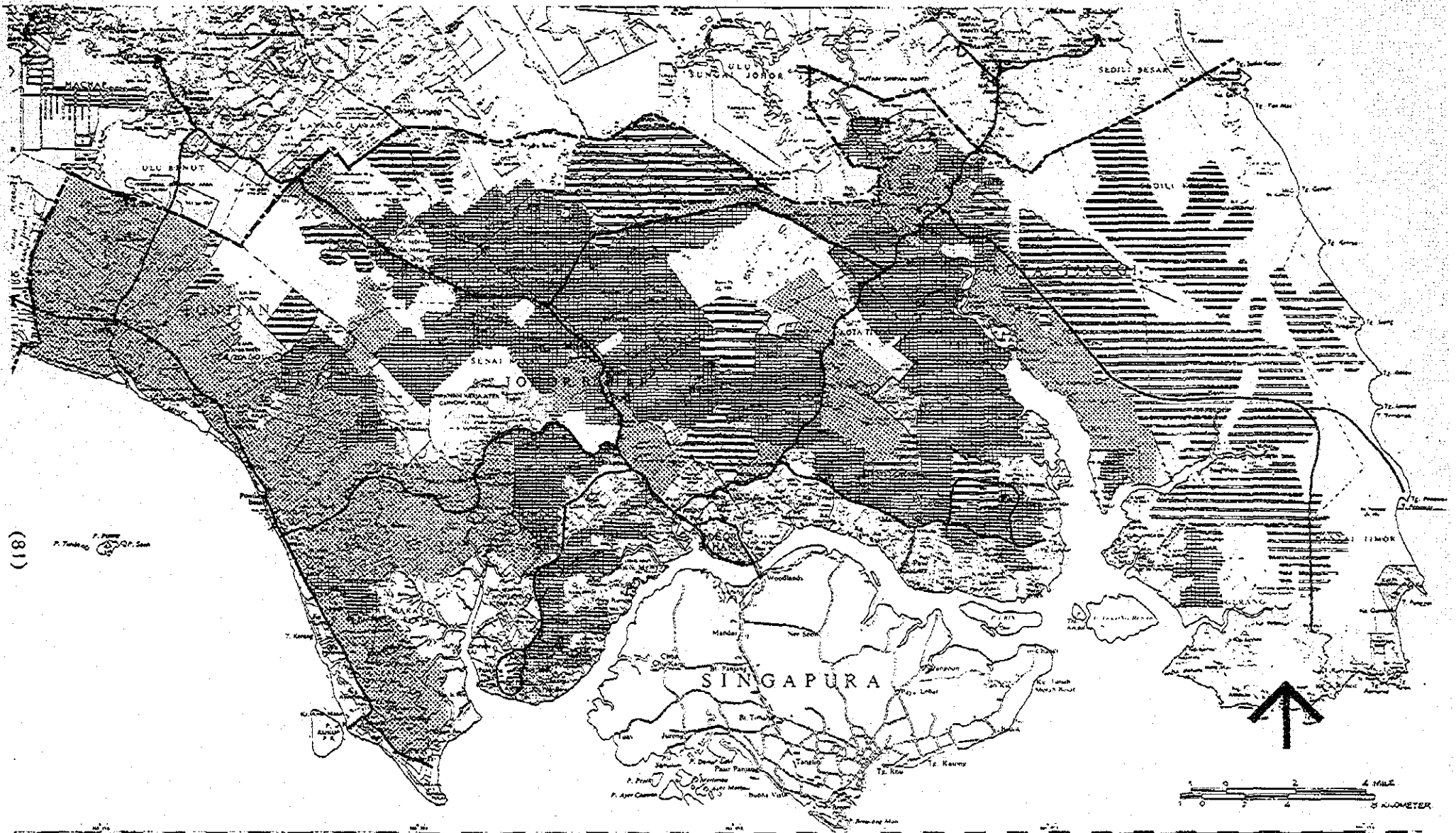



Fig. 4.5 : Types of Agricultural Holdings in the Study Area (1980)

The above figure illustrates the district[4] cropping patterns evident within the three districts. Pontian District is 91% private smallholdings with only 9% of estates and government agency-operated schemes (See also Fig. 4.19 Johor Bahru District has the most estate schemes (60%) and a fair distribution of private smallholdings and government schemes (25% and 15% respectively). In contrast, cultivated area in Kota Tinggi District is 68% government schemes, 23% estates and only 9% is

operated by private smallholders. This pattern is reflective of the change in government policy regarding land development over the years. Agricultural development in Johor Bahru and Pontian Districts is illustrated of an era when private estates (particularly the foreign companies) and private smallholdings played a major role in land development. On the other hand, the development in the District of Kota Tinggi reflects the current policy of planned land development wherein land schemes are undertaken by the Federal and State Governments as a means of solving the problems of unemployment and landlessness and to raise agricultural output.

The implication to be drawn from this pattern of change regards the landownership of agricultural land. With the exception of Kota Tinggi, the cultivated areas in the Districts of Pontian and Johor Bahru are largely private-owned (99% in Pontian District and 85% in Johor Bahru District).




(18)

# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- GOVERNMENT SCHEMES - Smallholdings & Block Schemes
- PRIVATE ESTATES
- PRIVATE SMALLHOLDINGS

TITLE:

AGRICULTURAL SCHEMES BY MANAGEMENT TYPES

MAP NO.

FIG. Fig. 4.6

(b) Crop Type - Estate and smallholding Subsectors

(i) Estate Subsector

While government agency estates[1] increased in area by more than twice in the past 3 years, private estates only expanded by about 7,000 ha. However, 80% of estate land is still under the management of the private sector. The private estates having been established during the post-war era is still largely planted with rubber although there has been a steady decline in the area under rubber from 68% in 1977 to 61% in 1980. This may be due in part to fragmentation of estates into smallholdings and also to the conversion of considerable areas rubber areas to oil palm as this crop was more profitable and estates found it difficult to obtain new lands[2]. Subsequently, oil palm area in private estates leaped from 27% in 1977 to 35% in 1980. (See Table 4.21 and also Fig. 4.22).

Table 4.22 : Crops Cultivated in Estates (1977-80)

| Crop Type | Non-government Agency Estates | | | | Government Agency Estates | | | | Total Estate Area | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1977 | | 1980 | | 1977 | | 1980 | | 1977 | | 1980 | |
| | Ha. | % | Ha. | % | Ha. | % | Ha. | % | Ha. | % | Ha. | % |
| Rubber | 69,427 | 68 | 67,052 | 61 | 4,566 | 37 | 8,440 | 32 | 73,993 | 65 | 75,492 | 56 |
| Oil Palm | 27,985 | 27 | 38,673 | 35 | 7,855 | 63 | 16,842 | 64 | 35,840 | 31 | 55,515 | 41 |
| Pineapple, cocoa & coconut | 4,510 | 5 | 3,582 | 4 | - | - | 952 | 4 | 4,510 | 4 | 4,534 | 3 |
| | 101,922 | 100 | 109,307 | 100 | 12,421 | 100 | 26,234 | 100 | 114,343 | 100 | 135,541 | 100 |

Source: Department of Agriculture, Johor Annual Reports (1977 & 80)

1. Government agency estates are defined as block schemes under the control and management of a public authority eg. KEJORA or SEDC in the case of Johor.
2. An explanation offered by S. Selvadurai in Agriculture in Peninsular Malaysia (1978).

Until 1970, agriculture in Johor was mainly in the form of estates[3] and smallholdings[4]. In 1973, only 8% of the total cultivated area in the State was under the management of FELDA with the estate and private smallholding subsectors holding 56% and 36% respectively[5]. By 1980 however, Government Agencies in the like of FELDA, FELCRA, KEJORA, RISDA, etc. were in management of 16% of total cultivated area (See Table 4.23). This is congruent to present government policy regarding agricultural development in the country; subsequent to the Second Malaysia Plan, the Government has more or less stopped alienating land for the estate subsector. Agricultural development since then has been in the form of government agency land schemes[6].

Table 4.23 :Cropped Areas under Smallholdings, Estates and Government Agencies (1977, 1980)

| | | PRIVATE SMALLHOLDINGS | | ESTATES | | GOVT. AGENCIES | | TOTAL CULTIVATED AREAS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Ha. | % | Ha. | % | Ha. | % | Ha. | % |
| Pontian | | 58,421 | 91 | 5,287 | 8 | 328 | 1 | 64,036 | 100 |
| Johor Bahru* | | 28,291 | 25 | 68,112 | 60 | 17,331 | 15 | 113,734 | 100 |
| Kota Tinggi | | 13,399 | 9 | 35,908 | 23 | 103,133 | 68 | 152,440 | 100 |
| TOTAL | 1980 | 100,111 | 30 | 109,307 | 33 | 120,792 | 37 | 330,209 | 100 |
| | 1977 | 107,826 | 37 | 108,119 | 37 | 77,807 | 26 | 293,752 | 100 |
| JOHOR STATE | 1980 | 447,260 | 47 | 308,902 | 32 | 195,987 | 21 | 952,149 | 100 |
| | 1977 | 417,014 | 49 | 296,524 | 35 | 134,267 | 16 | 847,807 | 100 |

Source: Department of Agriculture, Annual Reports (1977 & 1980)
* Refers to the whole of Kota Tinggi District.

3. An estate is defined as a farm of 40 ha. (100 ac.) or more of cultivated land which is managed as a single agricultural unit.
4. Smallholdings are farms of less than 40 ha. but the majority of most smallholdings are around 2 ha.
5. S. Selvadurai, Agriculture in Peninsular Malaysia (1978)
6. This system combines the advantages of both the smallholdings and estate type organisation. Here, blocks of land of about 2000 ha. are developed as a "Scheme" and settlers are given plots of about 4 ha. each.

Government agency estates on the other hand started operation in the 1960's, and a period during which the high profitability of oil palm was realised. Oil palm dominates over 60% of their total planted estate acreages.

Pineapples, cocoa and coconut make up the remain 3-4% of estate-cultivated crops. Pineapple although seemingly insignificant in terms of area is an important crop in the Study Area. Pineapples for the canning industry are cultivated only in the State of Johor and mainly in the District of Pontian which has extensive areas of peat soils. In 1980, the Study Area produced 32% of the pineapples for the canning industry in the country[7].

ii) Smallholding Subsector

As in the estate subsector, the smallholding subsector can be distinguished into private owned and government-controlled holdings. On the whole, the area under rubber has diminished from 47% of total cultivated smallholding subsector in 1977/to 39% in 1980, while that for oil palm increased from 35% in 1977 to 43% in 1980. Also, while government-controlled smallholdings increased its share in total smallholding area from 38% in 1977 to 49% in 1980, private smallholdings shrank by over 7,000 ha. from 1977 to 1980 (See Table 4.24). Possible reasons for the decrease include the change of use from agriculture to something some profitable or a change of occupation from farming to other forms of employment.

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7. Department of Agriculture, Johor, Annual Report (1980)
8. Government-controlled smallholdings comprise of Group Settlement schemes of FELDA, FELCRA, Youth Schemes and State Schemes wherein centralised management and control provides the smallholders with technical advisory services, credit, processing and marketing facilities. The operators of smallholdings under the schemes are not allowed to sell or sub-divide their farms.

Table 4.24 Crops Cultivated in Smallholdings (1977-80)

| Crop Type | PRIVATE SMALLHOLDINGS | | | | FELDA & FELCRA SMALLHOLDINGS | | | | TOTAL SMALLHOLDING SUB-SECTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1977 | | 1980 | | 1977 | | 1980 | | 1977 | | 1980 | |
| | Ha. | % | Ha. | % | Ha. | % | Ha. | % | Ha. | % | Ha. | % |
| Rubber | 67,042 | 62 | 61,132 | 61 | 13,737 | 21 | 14,414 | 15 | 80,779 | 47 | 75,546 | 39 |
| Oil Palm | 10,073 | 9 | 5,172 | 5 | 51,060 | 78 | 79,232 | 84 | 61,133 | 35 | 84,404 | 43 |
| Coconut | 18,959 | 18 | 19,306 | 19 | 84 | 0.2 | 84 | 0.1 | 19,043 | 11 | 19,390 | 10 |
| Pineapple | 3,780 | 4 | 3,008 | 3 | - | - | - | - | 3,780 | 2 | 3,008 | 2 |
| Orchard crops & other cash Crops | 7,972 | 7 | 11,493 | 12 | 505 | 0.8 | 828 | 0.9 | 8,477 | 5 | 12,321 | 6 |
| TOTAL | 107,826 | 100 | 100,111 | 100 | 65,386 | 100 | 94,558 | 100 | 173,212 | 100 | 194,669 | 100 |

Source: Department of Agriculture, Johor, Annual Reports (1977 & 80)

Generally, the technical problem of extracting the palm oil from the fruit prevents the smallholder from growing the crop as evident from the very small area cultivated with oil palm among private smallholders. Rubber and coconut is generally easier to manage and allows the farmer to take advantage of multiple cropping; other crops such as fruits, cocoa, etc. are also grown to spread out the risks of falling prices and crop failures.

Government-controlled smallholdings are organised in estate-like schemes mainly by FELCRA and FELDA. In fact, FELDA started its first oil palm scheme which was also its first non-rubber scheme around 1960 at Kulai in Johor and made use of an oil palm estate factory to process its crop[9]. Since then, FELDA and FELCRA have opened up several other oil palm schemes in the Study Area, particularly the district of Johor Bahru and in Tanjong Penggerang.

9. Conversation with Mr. Tan Choo Laik, Timbalan Pengarah, Department of Agriculture, Johor (1981)

### 4.5.2 Forestry

The state of Johor is richly endowed with productive forests. In 1976, there were about 458,000 ha. of land forest reserves and 25,600 ha. of swamp forest reserves in Johor[10]. The forested areas in Johor are divided into 4 zones; the Study Area is located within the Johor South zone. Within this zone in 1976, there were about 109,000 ha. of forest reserves of which 49% were already worked on, leaving about 56,700 ha. (or 51%) yet to be exploited[11].

From Fig. 4.22, it is evident that very little land forested areas are located in the Districts of Pontian and Johor Bahru although extensive swamp forests are located at Sungei Pulai, Sungei Johor and Sungei Lebam. Larger tracts of forests, (but disturbed forests) are confined to Tanjong Penggerang where, due to previous logging activity, virtually no timber remains which can at present be classified as marketable.

At present, reafforestation activity is taking place at 4,000 ha. per year compared to annual forest exploitation of 8,100 ha. This is accrued to the lack of manpower. It is important that the reafforestation program keeps abreast with the rate of logging to ensure a supply of forest resources in the future. Under the Fourth Malaysia Plan, about 77,700 ha. were be treated under the Silviculture Program.

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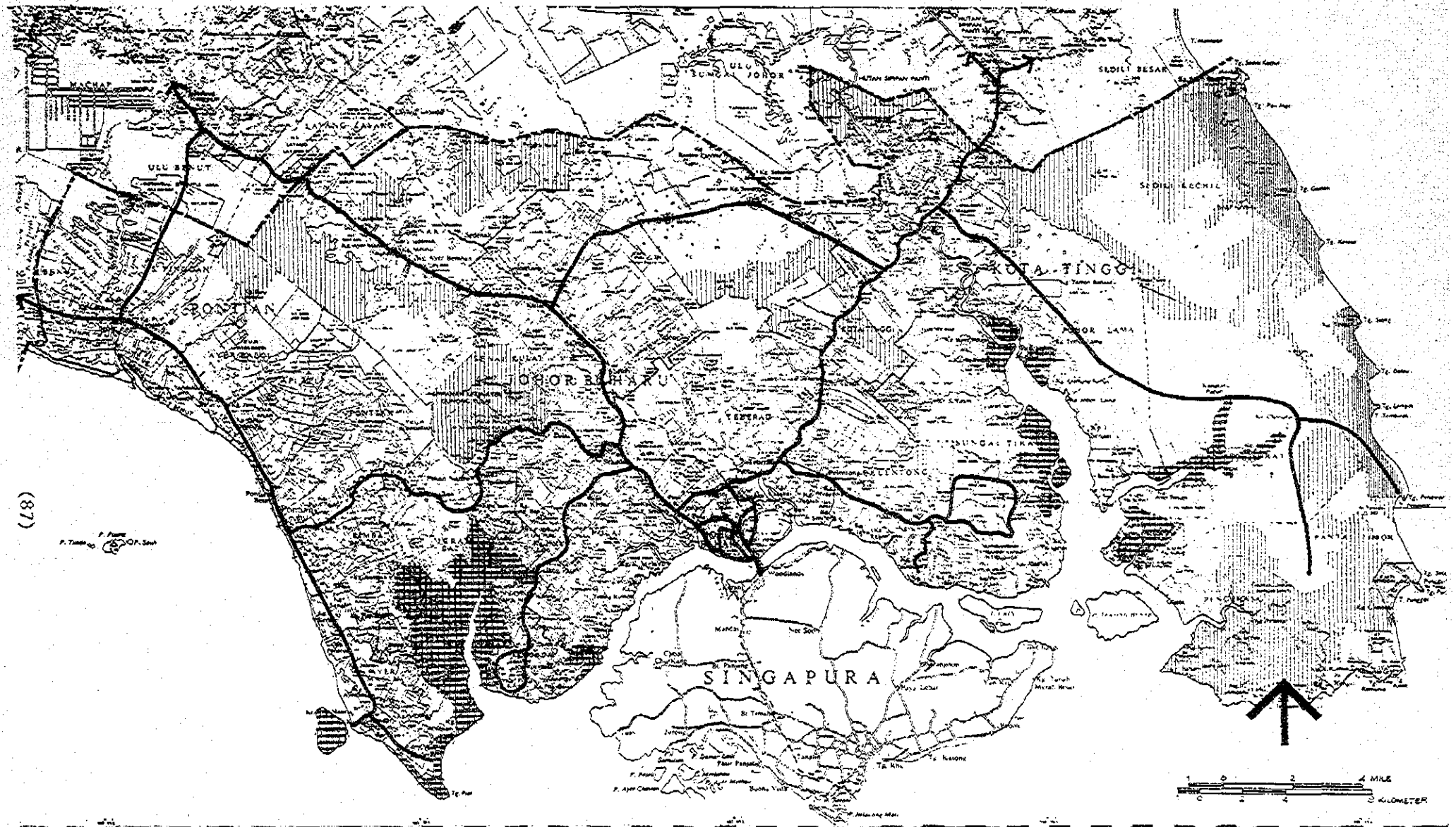
10. This does not include some state land which also contain productive forests.
11. Economic Survey of Johor, 1978.






# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- AREAS UNDER FOREST
- GAZETTED FOREST RESERVES
- GAZETTED SWAMP RESERVES

TITLE:

FOREST AREAS

MAP NO.

Fig..4.7

### 4.5.3 Mining

(a) Bauxite

The Study Area produces all the bauxites in West Malaysia. The bauxite reserves are located at Telok Ramunia in Tanjong Penggerang. Thorough prospecting have located approximately 10 million tons of ore reserves in that area. It is estimated that the reserves will be able to sustain mining operations there at present scale for several years. Other possible areas of bauxite deposits are located in Tanjong Penggerang but they are on alienated and developed agricultural land. (See Fig. 4.21). Detailed prospecting is still necessary to make a reliable assessment of the extent of these deposits.

(b) Tin

Johor is the fourth largest producer of tin in the country. The tin mines in the Study Area are located at Lombong in Kota Tinggi District. These mines have been operative for many years and though still productive are fast being depleted. Small quantities of columbite, tungsten, illeminites, monazite and wolfranite are being produced from alluvial tin-mining operations.

(c) Silica Sands

Areas of high grade silica sand are being worked particularly in the south-

eastern coastern strip of Tanjong Penggerang while an area further north is been alienated for future working. However, it is believed that the latter area does not contain any large enough, commercially viable deposits. Careful prospecting is required.

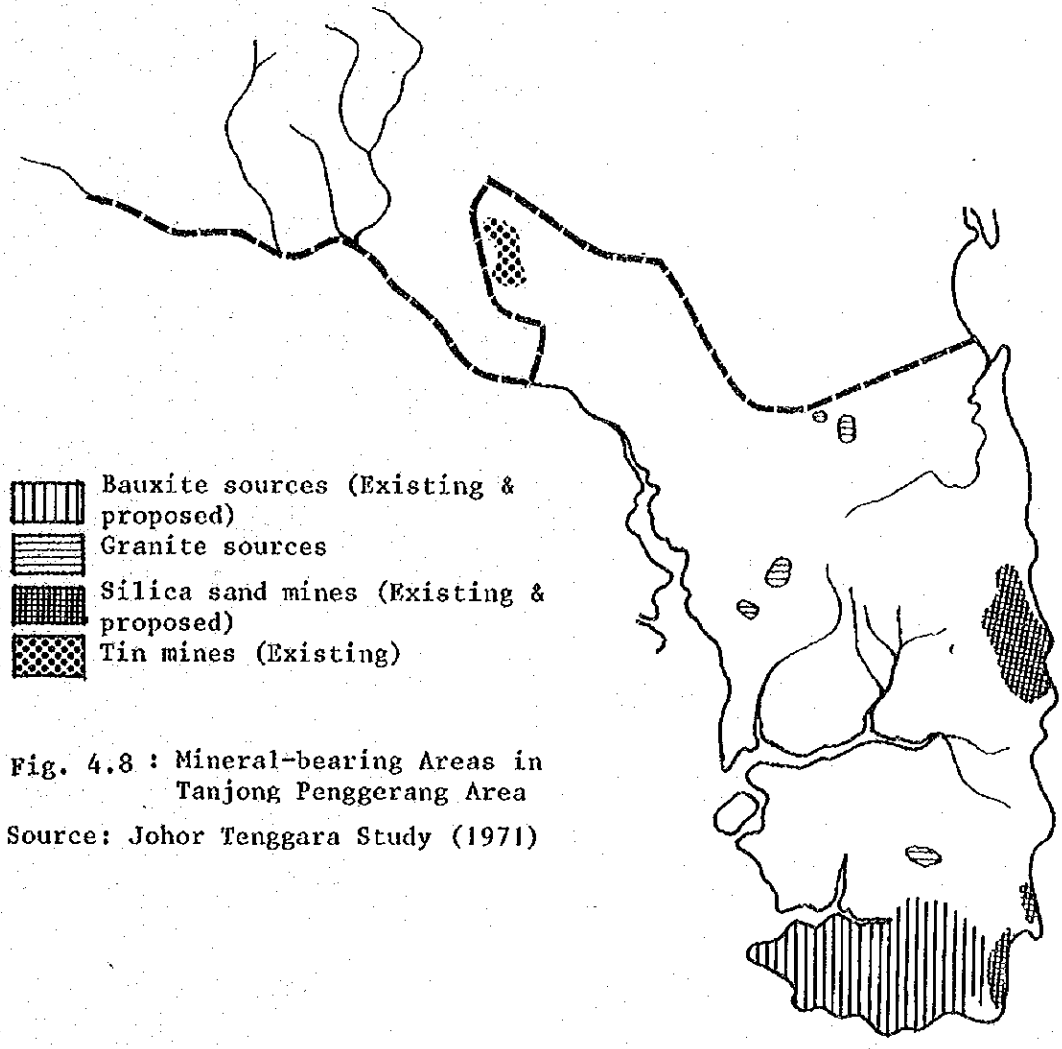



Fig. 4.8 : Mineral-bearing Areas in Tanjong Penggerang Area

Source: Johor Tenggara Study (1971)

### 4.5.4 Fisheries

Fishing in relation to the Study Area is carried out along the coastal waters on the east and west coast and along the Straits

of Johor. There were over 16,206 registered fishermen in Johor in 1980 of which 59% were found in the Districts of Pontian, Johor Bahru and Kota Tinggi (See Table 4.25).

Table 4.25 : Number of Fishermen (1975 - 80)

| Districts | 1975 | | 1980 | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Pontian | 1,977 | 16 | 2,884 | 18 |
| Johor Bahru | 2,582 | 21 | 3,779 | 23 |
| Kota Tinggi | 2,327 | 19 | 2,907 | 18 |
| Total | 6,886 | 57 | 9,570 | 59 |
| Other districts* | 5,274 | 43 | 6,636 | 41 |
| Johor State | 12,160 | 100 | 16,206 | 100 |

Source: Fisheries Department, Johor, Annual Reports (1975 & 80)
* These include Muar, Batu Pahat and Mersing.

Johor Bahru district despite its urbanity and limited coastal waters seems to have the largest share of registered fishermen. The reason may be the prevailing demand for seafood in the major towns located here. According to MAJUIKAN, 100% of the fish marketed in Johor Bahru district is for local consumption whereas in the Kota Tinggi and other fishing districts, only 20-30% of the fish caught is consumed locally while the rest is sold to other districts (Johor Bahru, Segamat, Kluang) and Singapore.

The State Fisheries Department has in the past few years being receiving complaints from fishermen regarding pollution of the Straits water which adversely affect their catches. This Department collaborates

with the Environmental Pollution Department in taking measures to overcome the pollution problem. So far, their activities have been limited to monitoring oil spills (especially along the Straits of Malacca) and to the control of riverine pollution caused by indiscriminate factory discharge which contribute in no small way to the present dismal condition of the Johor Straits. Complaints from fishermen operating along the Pontian and Kota Tinggi coasts on the other hand, are related mainly to illegal trawling activities.

The above problem is reflected in the fish landings from different districts. (See Table 4.26) Fish landings in the Districts of Pontian and Johor Bahru have declined by more than 50% between the period 1975-79. In 1979, Johor Bahru district only contributed 1% to total landings in the state while landings in Pontian district decreased from 20% in 1975 to 10% in 1979. Kota Tinggi district however, increased its share of landings from 26% in 1975 to 45% in 1979. Its productiveness is due mainly to the extensive use of trawlers in the deep sea area in the east coast.

Table 4.26 : Fish Landings - 1975 and 1979 ('000 kg.)

| District | 1975 | | 1979 | |
|---|---|---|---|---|
| | Landings | % | Landings | % |
| Pontian | 7,610 | 20 | 5,817 | 10 |
| Johor Bahru | 1,197 | 3 | 874 | 1 |
| Kota Tinggi | 10,117 | 26 | 27,278 | 45 |
| Total | 18,924 | 49 | 33,969 | 55 |
| Other districts | 19,966 | 51 | 27,004 | 44 |
| Johor State | 38,890 | 100 | 60,973 | 100 |

Source: Fisheries Department, Johor, Annual Reports (1979 & 75)

In addition to coastal landings, fish is also obtained via aquaculture activities, inland fish ponds and rivers. The Fisheries Department has set up two aquaculture areas along the Straits of Johor at Tanjong Sungei Melayu and Tanjong Kupang. Essentially, inland fishing is regarded as a means of subsidising the income of agricultural smallholders. More than 1/3 of the inland fishing areas in Johor are located in the Study Area. In 1980, there were 1,410 fish ponds covering an area of 212 ha. (See Table 4.27). This means that the ponds are relatively small, an average of 0.15 ha. per pond. According to the Department of Fisheries the recommended size of ponds should be about 1 ha. in order to be viable economically.

Table 4.27 : Inland Fish Ponds (1980)

| | No. of ponds | Area (Ha.) |
|---|---|---|
| Pontian | 46 | 9 |
| Johor Bahru | 346 | 55 |
| Kota Tinggi | 111 | 20 |
| Total | 503 | 84 |
| Other districts | 907 | 128 |
| Johor State | 1,410 | 212 |

Source: Fisheries Department, Johor, Annual Reports (1980)

### 4.5.5. Agricultural Prospects for the Future

In 1970, the total number of people engaged in agricultural activities in the Study Area was 65,328. Based on the productivity assumption method, the total number employed in the agricultural sector in 1980 was earlier estimated at 70,900 (high estimate), an increase of only 0.8% for the period 1970-80. However, an analysis of the labor force in the cropping subsector based on varying land/man ratios for different crops under different management systems (that is, estate and smallholding) indicated that the agricultural sector in the Study Area was actually capable of absorping some 106,000 people of which 91% are in the cropping subsector. (See Table 4.28).

Table 4.28 :Estimated Labor Force Capacity in Agriculture (1970/80)

| District | 1970 Total | 1980[2] | | | |
|---|---|---|---|---|---|
| | | Cropping | Fishing | Others | Total |
| Pontian | 23,652[3] | 23,174 | 2,884 | 40 | 26,098 |
| Johor Bahru | 34,211[1] | 36,673 | 3,779 | 20 | 40,472 |
| MPJB | 1,158[1] | - | | - | - |
| Tg. Penggerang | 6,307[2] | 36,550 | 2,180 | 487 | 39,217 |
| | 65,328 | 96,397 | 8,843 | 547 | 105,787 |

Sources: 1. Structure Planning Unit (1981)
2. Study Team Estimates based on land/man ratios (1981)
3. Johor Barat Physical Planning Study (1980)

The discrepancy is serious in the sense that it points to the fact that existing agricultural land is highly underutilised, and that an intensification of use will further generate employment for 40,000 more people.

It was established that 64.3% of land in the Study Area had already been developed in the sense that much of it is under cultivated, utilised for mining or are existing urban areas. Furthermore, it is estimated that there are approximately 14,000 ha. of Class 1 and class 2 soils (soils suitable for agriculture) remaining that are yet underdeveloped. It can be said then, that the possibility of major future agricultural developments is highly unlikely[12]. Of significance too is the existing trend whereby agricultural land is converted for residential development and infrastuctural development. By 2000, total cultivated area is expected to be further reduced to 271,990 ha. It is implicated that approximately 6,900 ha. of existing agricultural land will be utilised for housing, institutional, infrastuctural and industrial development.

Table 4.29 Agriculture Land Distribution (1980-2000)

| | | | Agriculture Land 1980 (ha) | Agriculture Land in 2000 (ha) | | |
|---|---|---|---|---|---|---|
| | | | | Displaced | New Developed | Total |
| Primary Area | Johor Bahru | MPJB | 0 | 0 | 0 | 0 |
| | | Plentong | 16,883 | 2,713 | 0 | 14,170 |
| | | Senai - Kulai | 30,793 | 559 | 0 | 30,234 |
| | | Other Area | 66,057 | 1,127 | 1,280 | 66,210 |
| | | Sub Total | 113,733 | 4,399 | 1,280 | 110,614 |
| | Kota Tinggi | Kota Tinggi | 23,803 | 442 | 1,932 | 25,293 |
| | | Others | 18,340 | 82 | 1,510 | 19,768 |
| | | Sub Total | 42,143 | 524 | 3,442 | 45,061 |
| | Total | | 155,876 | 4,923 | 4,722 | 155,675 |
| Secondary Area | Pontian | Pontian Kecil | 10,490 | 891 | 0 | 9,599 |
| | | Others | 53,546 | 642 | 4,320 | 57,224 |
| | | Sub Total | 64,036 | 1,533 | 4,320 | 66,823 |
| | Tanjong Penggerang | | 60,371 | 417 | 4,957 | 64,911 |
| | Total | | 124,407 | 1,950 | 9,277 | 131,734 |
| Study Area Grand Total | | | 280,283 | 6,873 | 13,999 | 287,409 |

Source : Study Team Estimate (1981).

12. An opinion confirmed by the Department of Agriculture, Johor (1981).

## 4.6 Identification of Development Potentials and Constraints

Essentially, the Sieve Map illustrates the physical possibilities of developing areas within the Study Area. It does not aim to determine the future pattern of development, but rather, it is an attempt to identify areas suitable for varying types of development as well as to identify areas of environmental interest that ought to be protected and conserved. The sieve map is a result of 'sieving' out the constraints factors from the development potentials identified in two other previous base maps (See Fig. 4.9 and Fig. 4.10).

Subsequently, the development possibilities have been grouped into four basic categories:

- Areas of resource potential
- Areas of no resource potential
- Existing and committed urban developments
- Areas of environmental interests

### 4.6.1 Areas of Resource Potential

Areas of resource potential are defined as existing undeveloped areas of agricultural potential and mineral-bearing areas. It is evident that there are very few areas of high agricultural potential remaining for future agricultural development in the Study Area. There is approximately 14,000 ha. of land classified under Class 1 and Class 2 soils that is yet to be developed. Of this, 70% is located in the Tanjong Penggerang area. Preferably, these areas of high crop-suitability should be earmarked solely for agricultural development. In addition to these, existing mines are found

at Teluk Ramunia while yet another mineral-bearing area is located to the north-west of Tanjong Penggerang (about the village of Tanjong Kelesa). These areas are known to contain bauxite deposits. The latter area is however, presently alienated for agriculture.

4.6.2 Areas of No Resource Value

These areas contain neither fertile soils nor minerals. At the same time however, they do not possess any physical limitations to general urban development in that they are yet undeveloped and are not swampy or hilly. As such they are suitable for general urban development (such as highway, industry, housing, etc.) as the opportunity costs involved would not be so great. These areas are found in Tanjong Penggerang and also to the north-east of the Study Area; part of the committed Express Toll Highway passes through the latter area.

4.6.3 Existing and Committed Urban Development

Existing and committed urban development are regarded as advantages to development in that the urban services and opportunities available in towns and accessibility to linkages will act as growth stimulants. Urban development here refers to towns, housing schemes, industrial sites, and road and rail network. Such areas are located in a corridor pattern stretching along the north-south highway from Kulai to Johor Bahru to Pasir Gudang. This corridor area is very attractive for urban development by virtue of its

accessibility to regional linkages.

4.6.4 Environmental Areas

The environmental areas identified are currently government gazetted reserves. The Study Team estimates that there are over 16,000 ha. of gazetted forest reserves in the Study Area. These are:

- Pantai Forest Reserve (Kota Tinggi District)
- Bukit Hantu Forest Reserve (Johor Bahru District)
- Sedenak Forest Reserve (Johor Bahru District)
- Gunung Pulai Catchment Reserve (Johor Bahru District)

Swamp reserves occupy approximately 9,000 ha. They are located along rivers mouths especially. The gazetted swamp reserves identified are at:

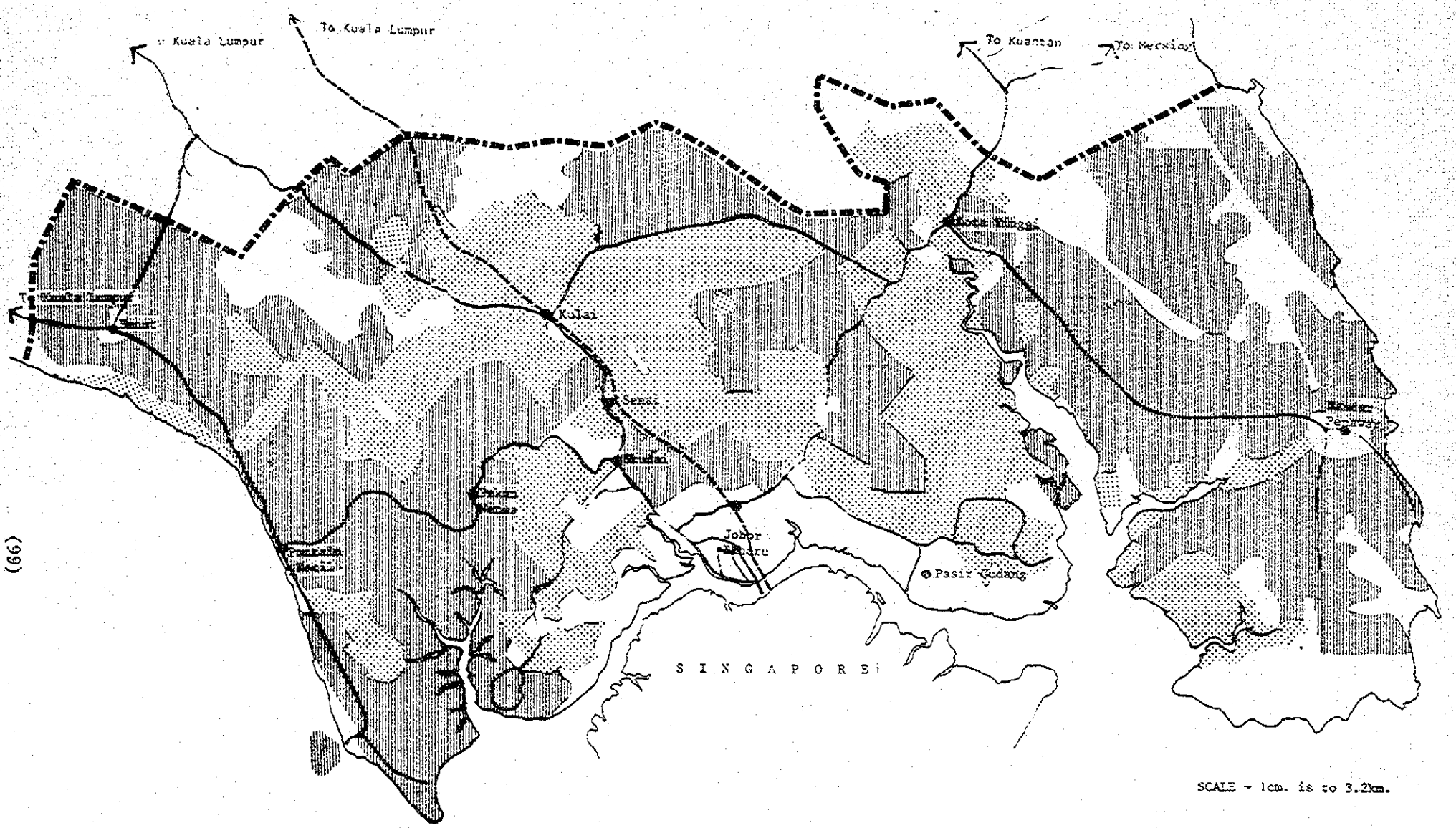
- Sungei Johor
- Sungei Lebam
- Sungei Pulai
- Pulau Kukup

Gazetted aborigine reservations are found in five seperate locations in the Study Area. Over 1,300 aborigines live in these reservations which total an area of 991 ha. (See Table 4.28). Slightly on the northern edge of the Study Area are two other aborigine reservations of considerable sizes - Kampung Semangar (Population: 96 and Area: 61 ha.) and Kampung Sungei Sayong Pinang (Population: 86 and Area: 40 ha.). The reservations located within the Study Area are:

Table 4.30 : Gazetted Aborigine Reservations in Study Area (1981)

| Aborigine Reservation | Area (ha.) | Population | Tribe | Occupation |
|---|---|---|---|---|
| 1. Kampung Sungei Pinggan | 109 | 500 | Orang Laut | Fishermen |
| 2. Pontian Besar | 2 | 290 | Orang Laut | Urban settlers |
| 3. Sungei Simpang Arang | 65 | 140 | Orang seletar | Fishermen and smallholder farmers |
| 4. Kampung Bakar Batu | 6 | 146 | Orang seletar | Fishermen |
| 5. Sungei Layan | 809 | 300 | Orang Laut | Fishermen and smallholder farmers |
| Total | 991 | 1,376 | | |

Source: Department Orang Asli, Johor (1981)




SCALE - 1cm. is to 3.2km.

(66)

# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

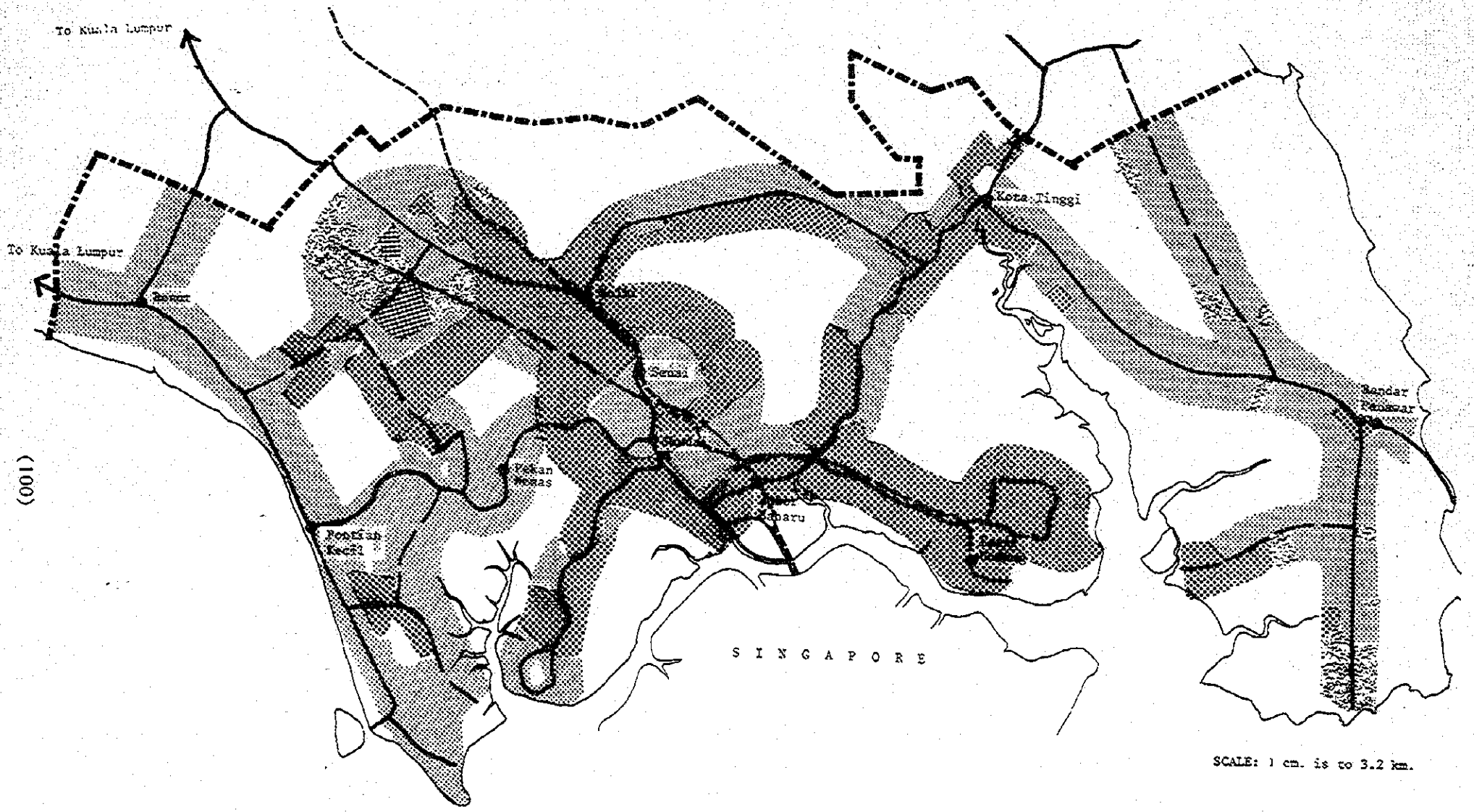
1st Level Constraints
- Environmental areas
- Class 1 & 2 soils
- Small holding agricultural land

2nd Level Constraints
- Swampy area
- Estate agricultural land
- Malay reserve land
- Existing Urban areas

DEVELOPMENT CONSTRAINTS

MAP NO.

Fig.4.9

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# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:
- No Constraint Area
- First Level Development Potential
- Second Level Development Potential

TITLE: DEVELOPMENT POTENTIAL

MAP NO. Fig. 4.10

# 5.0 THE INTERIM DEVELOPMENT FRAMEWORK

## 5.1 Urban Expansion Trend by the year 1990

### 5.1.1 Population Distribution

The future population by 2000 has been discussed in the population study which estimates a population of 1,350,400 and 928,600 in 2000 and 1990 respectively for the study area, while the actual population was 619,600 in 1980 census. The population study is carried out based on the breaking down method which, as a principle, controls the share of district population in Johor State, so that the effect on population increase by other related development programs would be estimated in conjunction with the balance of population share of the other districts. Consequently the population in 1990 estimated by this study is less than that estimated by both the Johor Barat and the Johor Tenggara scheme.

The population in the South Johor Region, on the other hand, was estimated higher than that of South Johor Regional Study (SJRS). It is partly due to under-estimation of the population in 1980 in the SJRS compared to the actual. (See Table 5-1)).

The actual population distribution in major urban area is estimated based on 1980 population field count survey, which shows a population of 336,800 or 73 per cent of the population in the primary area reside in the Johor Bahru metropolitan area. It implies that the major portion of population in the primary area concentrates in Johor Bahru Metropolitan Region.

Table 5.1 Comparison of the Projected Population.

| | | Primary Area | Secondary Area | | Total |
|---|---|---|---|---|---|
| | | | Pontian | Tanjong Penggerang | |
| Johor Bahru Urban Transport Study 1981 | 1990 | 708,000 | 164,700 | 55,900 | 928,600 |
| | | 872,700 | | | |
| | 1980 (Actual) | 458,900 | 121,700 | 39,000 | 619,600 |
| | | 580,600 | | | |
| Johor Tenggara Transport Study 1980 | 1990 | * | * | 106,470 | * |
| | 1980 (Est) | * | * | 50,130 | * |
| Johor Barat 1980 | 1990 | * | 163,024 | * | * |
| | 1980 (Est) | * | 135,800 | * | * |
| South Johor Regional Study | 1990 | 731,182 | | * | * |
| | 1980 (Est) | 567,543 | | * | * |

The increase of population in the Metropolitan Region will mainly be supported by the construction of Pasir Gudang new town and many other committed housing projects along the corridor. The urban population in the local centers in Pontian and Tanjong Penggerang is expected to extend its share in the region, mainly accelerated by the implementation of Johor Barat and Johor Tenggara Regional Development schemes.

Table 5.2: Future Population Estimate and Distribution
(1980 - 2000)

| | | | Total Population | | | Increment | |
|---|---|---|---|---|---|---|---|
| | | | 1980 (1000) *1 | 1990 (1000) | 2000 (1000) | 1980 - 1990 | 1990 - 2000 |
| Primary Area | Johor Bahru | MPJB | 247.0 | 398.5 | 520.0 | 151.5 | 121.5 |
| | | Plentong | 37.7 | 81.6 | 235.0 | 43.9 | 153.4 |
| | | Senai-Kulai | 52.1 | 62.0 | 79.9 | 9.9 | 17.9 |
| | | Other Area | 80.6 | 112.7 | 165.1 | 32.1 | 52.4 |
| | | Sub Total | 417.4 *2 | 654.8 | 1,000.0 | 237.4 | 345.2 |
| | Kota Tinggi | Kota Tinggi | 30.8 | 39.8 | 50.5 | 9.0 | 10.7 |
| | | Others | 10.7 | 13.4 | 16.4 | 2.7 | 3.0 |
| | | Sub Total | 41.5 | 53.2 | 66.9 | 11.7 | 13.7 |
| | | Total | 458.9 | 708.0 | 1,066.9 | 249.1 | 358.9 |
| Secondary Area | Pontian | Pontian Kecil | 25.5 | 48.9 | 62.3 | 23.4 | 13.4 |
| | | Others | 96.2 | 115.8 | 147.6 | 19.6 | 31.8 |
| | | Sub Total | 121.7 | 164.7 | 209.9 | 43.0 | 45.2 |
| | Tanjong Penggerang | | 39.0 | 55.9 | 81.6 | 16.9 | 25.7 |
| | | Total | 160.7 | 220.6 | 283.5 | 59.9 | 62.9 |
| Study Area Grand Total | | | 619.6 | 928.6 | 1,350.4 | 309.0 | 421.8 |

Note : *1 Actual Census 1980

*2 Included 2,900 of Navy Personnel from Singapore.

Source : The Study Team Estimate (1981).

### 5.1.2 Urban Land Requirement in 1990

The population increase results in the expansion of residential landuse in urban and rural areas. The expansion of urban areas has been approximately estimated by calculating new residential land requirement based on the assumptions of residential population density. The average density is assumed to be rather high where there are expected to have many committed developments in the form of housing estates and new towns, such as Johor Bahru - Pasir Gudang corridor, Senai/Kulai, Bandar Penawar new town and growth centers in Tanjong Penggerang.

It is shown that the land requirement in the primary area is estimated to increase from 13,734 ha. to 18,200 ha. in 1980 and 2000 respectively.

In the secondary area, however, it is anticipated that slightly more land is required in the second decade than in the first, although Pontian district will have a higher rate of increase in the first decade.

The share of the land newly required in the primary area by 1990 may probably reach at 81% of the Study Area, while the Johor Bahru - Pasir Gudang corridor shares approximately 62 per cent by the same year. (See Table 5-3). Our estimation suggests that the Johor Bahru - Pasir Gudang corridor will presumably still maintain and reinforce its superiority on urban growth over next 10 years as a center of the Metropolitan Region.

Table 5.3: Urban Land Requirement in 1990

| | | | Existing Urban Area (1980) (ha.) | Urban Land Requirement by 1990 (Increment) (ha) | | | | Total (ha.) | Total Urban Area (1990) (ha.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Residential | Industrial | Commerce | Other Land Use | | |
| Primary Area | Johor Bahru | MPJB | 7,502 | 1,229 | 233 | 131 | 478 | 2,071 | 9,573 |
| | | Plentong | 2,796 | 631 | 345 | 68 | 313 | 1,357 | 4,153 |
| | | Senai - Kulai | 1,117 | 106 | 49 | 10 | 50 | 215 | 1,332 |
| | | Other Area | 1,827 | 338 | 88 | 7 | 130 | 563 | 2,390 |
| | | Sub Total | 13,242 | 2,304 | 715 | 216 | 971 | 4,206 | 17,448 |
| | Kota Tinggi | Kota Tinggi | 462 | 156 | 10 | 3 | 51 | 220 | 682 |
| | | Others | 30 | 23 | 7 | 1 | 9 | 40 | 70 |
| | | Sub Total | 492 | 180 | 17 | 5 | 58 | 260 | 752 |
| | | Total | 13,734 | 2,534 | 732 | 221 | 979 | 4,466 | 18,200 |
| Secondary Area | Pontian | Pontian Kecil | 167 | 303 | 31 | 8 | 103 | 445 | 612 |
| | | Others | 498 | 173 | 54 | 19 | 74 | 320 | 818 |
| | | Sub Total | 665 | 476 | 85 | 28 | 176 | 765 | 1,430 |
| | | Tanjong Penggerang | 1,172 | 142 | 12 | 7 | 48 | 209 | 1,481 |
| | | Total | 1,837 | 618 | 97 | 35 | 324 | 1,074 | 2,911 |
| Study Area Grand Total | | | 15,571 | 3,152 | 829 | 256 | 1,303 | 5,540 | 21,111 |

Source : Study Team Estimate (1981).

## 5.2 Alternative Urbanization Pattern A

### 5.2.1 Regional Pattern

Based on the study of future development prospects by sector in 1990, the regional development pattern has been drawn up within the the study area. The sectoral studies on population distribution, and network system mentioned about the great potential for urban growth in Johor Bahru Metropolitan Region over the next two decades. Overall development trend seems to indicate the higher possibility of the formation of an urban corridor linking Kulai, Senai, Johor Bahru and Pasir Gudang.

However, this should not imply a conflict with the present government policy of encouraging rural developments. Future trends of the urban development within Johor Bahru - Pasir Gudang corridor is largely dependent on how the private investments will go on; the growth impetus has been set in the recent past by both public and private investments in the form of infrastructure, industrial sites, etc. Thus, it is most likely that urban growth will continue if not accelerate.

It is probable that by the year 1990, a substantial proportion of the urban development will have occured in the metropolitan region.

Meanwhile, government investment will be adequately distributed in the rural areas through the rural development schemes such as Johor Tenggara and Johor Barat Drainage scheme.

Major rural centres will be able to achieve positive population growth supported by those public investments.

Consequently, the adequate balance of investments both in the metropolitan region and the other rural area would contribute to formulate the pattern in which the moderate growth of the metropolitan region and the stability of the growth in rural centres will be observed.

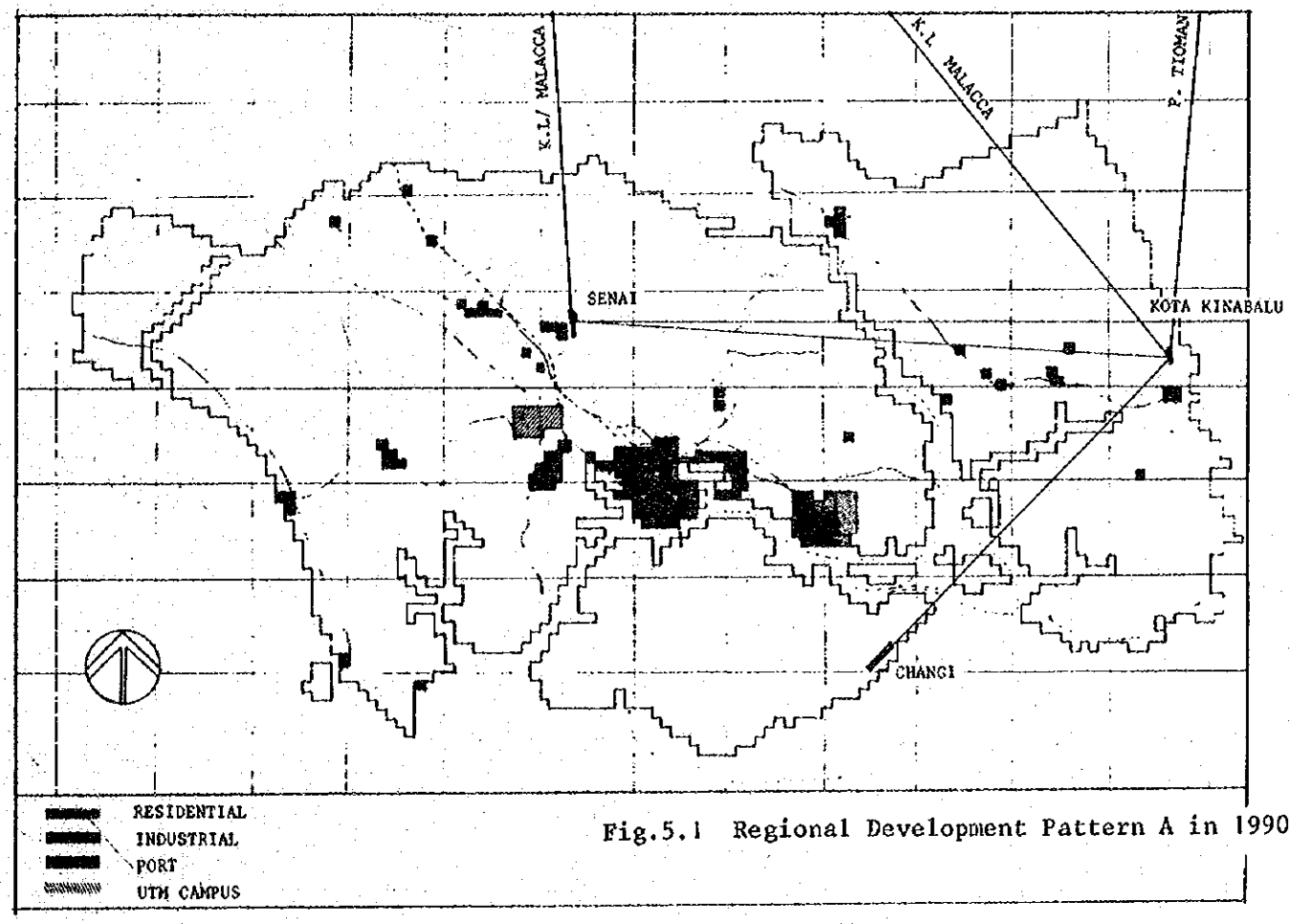



Fig.5.1 Regional Development Pattern A in 1990

5.2.2 Johor Bahru - Pasir Gudang Corridor

The development trends in the Johor Bahru - Pasir Gudang corridor will be dependent on the implementation of various proposed developments. There are 13 committed housing projects in the corridor area which are capable of accomodating a population of some 600,000 over an area of 3,730 ha. (See Housing projects projects in the Study Area, the development commitment.

The additional population generated by committed housing projects (They are approved and/or under construction) is estimated to exceed approximately three times the population projected by the Study Team in which the increment from 1980 to 1990 is 222,000. It appears that the housing developments are exceedingly over-provided despite that the additional population increase due to housing replacement and housing backlog should be taken into consideration.

"Shadow Population" which is 378,000 and defined as the difference between the committed projects and the estimated population, will be diversified by the actual progress of the housing construction following the movement of the market forces. This implies that two alternatives can be set up of which the minimum population growth follows the estimated population and maximum follows the population of the committed projects.

The alternative A is formulated based on the minimum growth and agricultural land and undeveloped area will be extensively remained within the corridor in 1990.

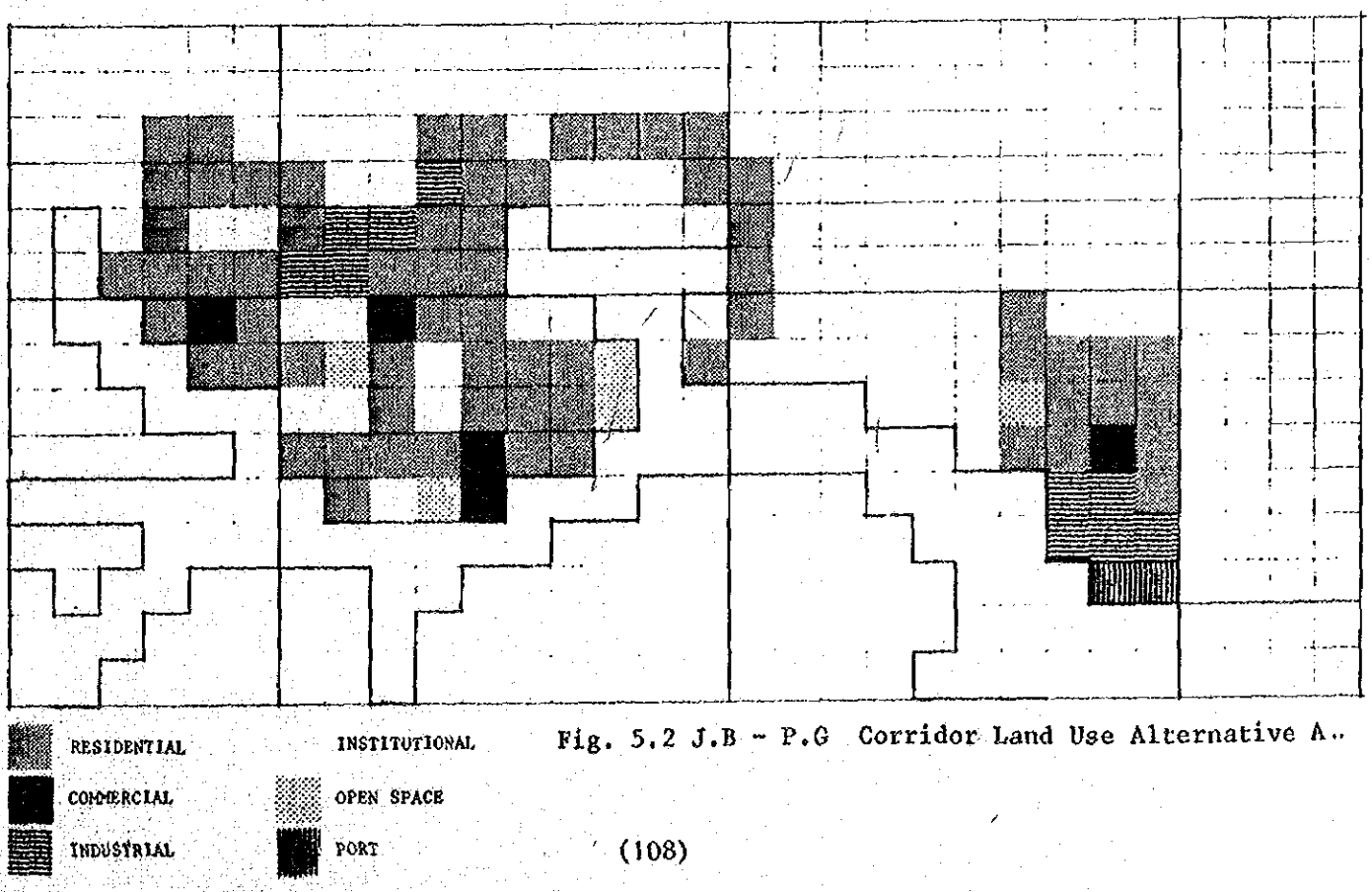



Fig. 5.2 J.B - P.G Corridor Land Use Alternative A.

## 5.3 Alternative Urbanization Pattern B

There is an interim land use zoning map which indicates the actual existing land use and the land use of the committed projects and applied along the Johor Bahru - Pasir Gudang Corridor. The Johor State Town and Country Planning Department, at present, utilises it as a guide for the approval of the applications of the development within the area.

The interim zoning area which involves the committed and the non-committed projects can accomodate at least 850,000 of the population in the corridor.

If the market demands of housing are so great and the housing construction reaches the maximum supply level, there may be a possibility to form a continuous urban area between and including Johor Bahru and Pasir Gudang.

On the other hand, the rural area will not be able to enjoy population growth in this same manner because of higher concentration of population to the corridor.

Industrial and Commercial Development will have to be much stimulated to generate sufficient employment opportunities and higher urban functions in order to support population and better urban services.

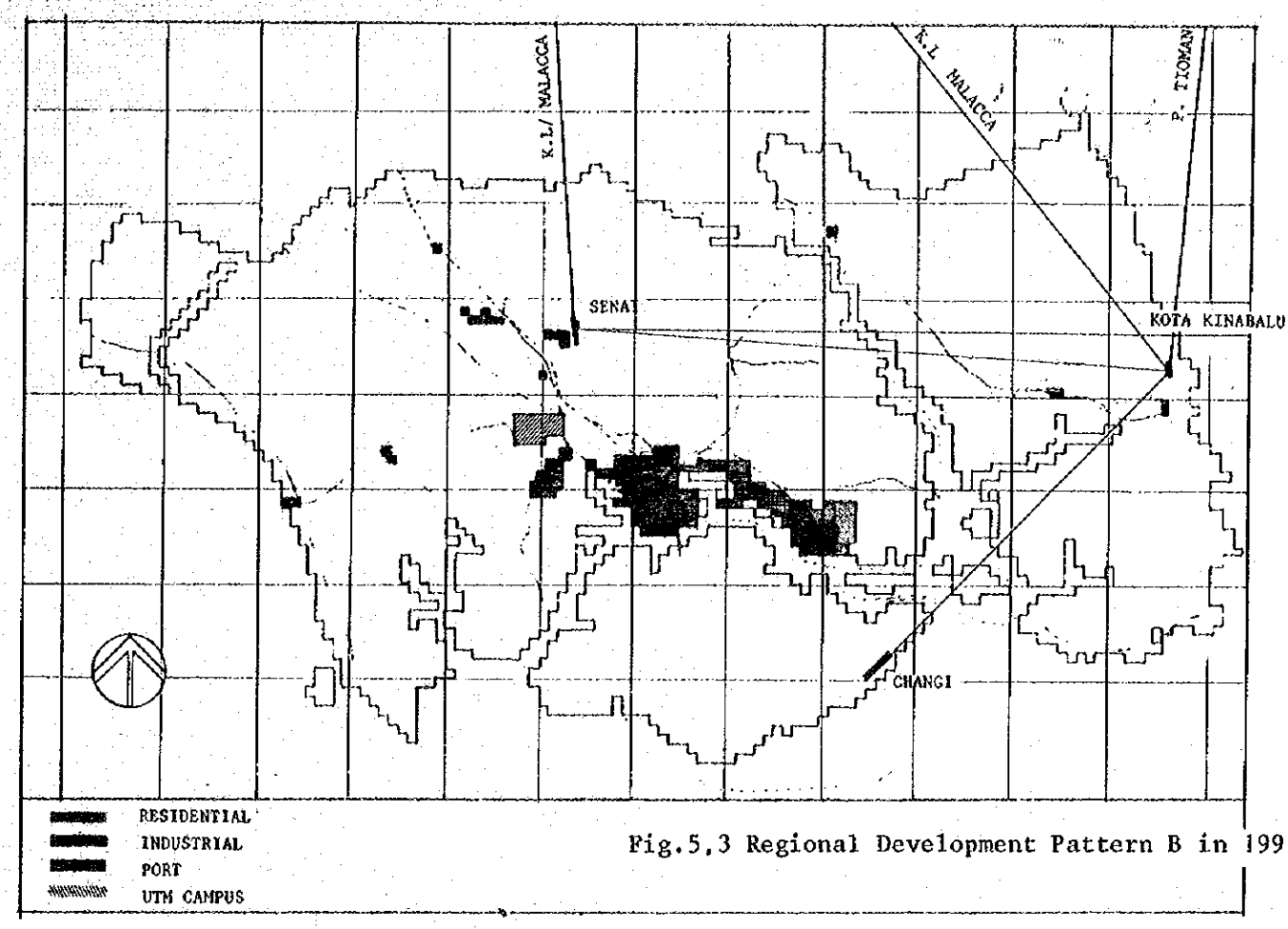



Fig.5,3 Regional Development Pattern B in 199

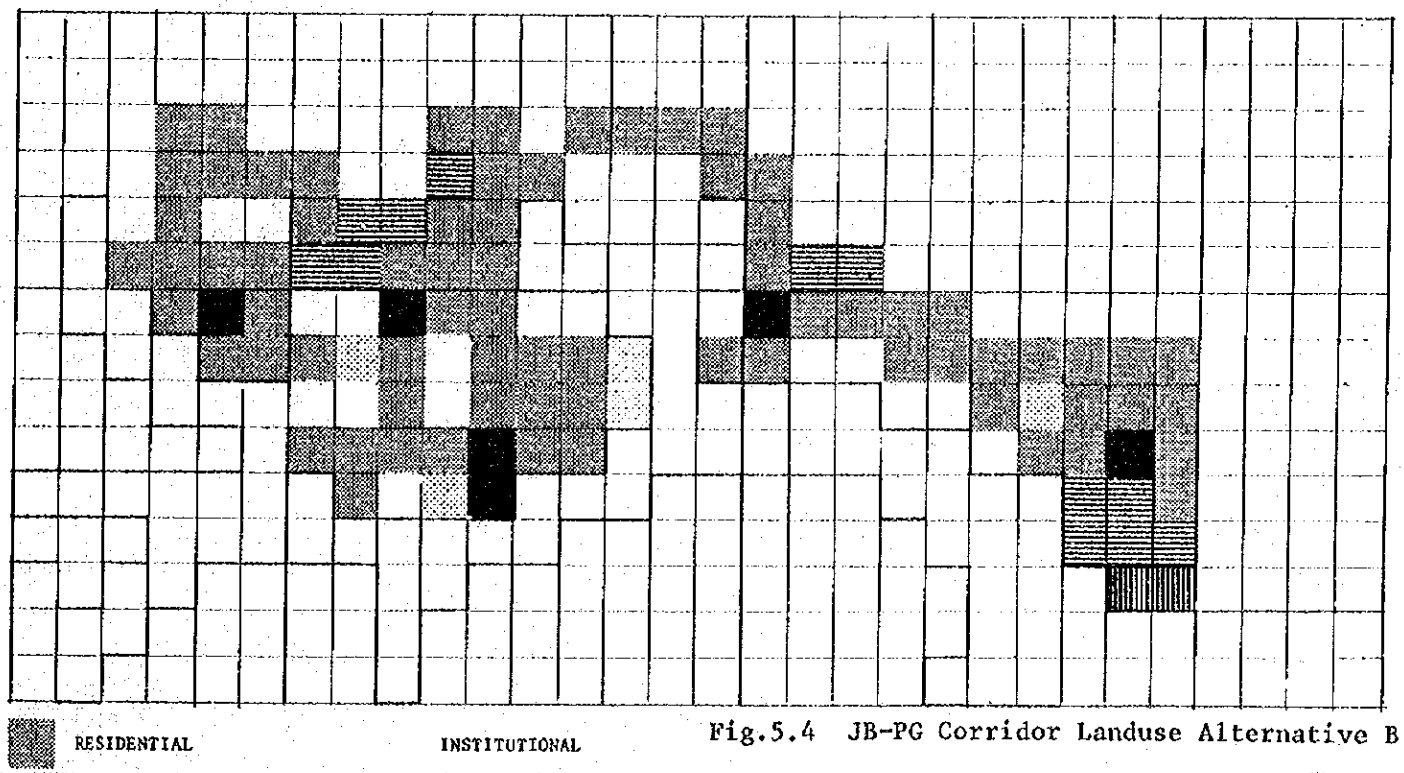



Fig.5.4 JB-PG Corridor Landuse Alternative B

# 6.0 THE LONG TERM DEVELOPMENT FRAMEWORK

## 6.1 Long-Term Urbanization Pattern

The long term urbanization patterns are formulated based on the analysis of the future development scenarios, sectoral development prospects in 2000, and future urban hierarchy in the region after 1990. At this stage, it focuses on the study of the macro-potential base ie. the discussion of the urbanization pattern, independent of the linkage system with Singapore.

Alternative II is selected out of the three alternatives formulated. The evaluation of them was made through the examination of the compatibility of the patterns to the development strategy and targets supported by the state department of town and country planning and the other planning criteria concerned.

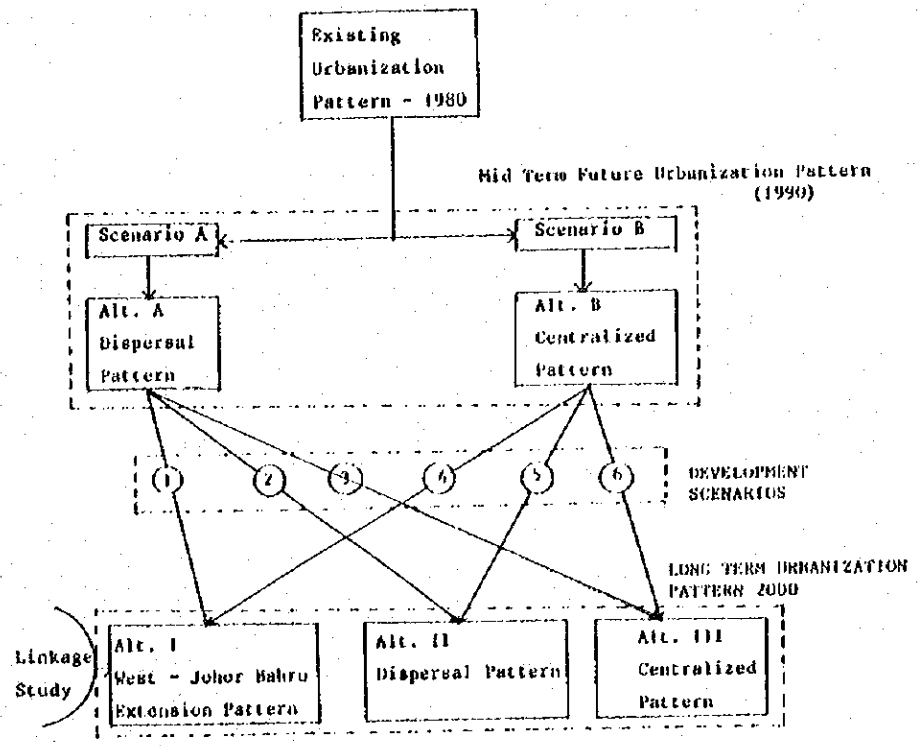



Fig. 6.1 Process of Achieving Long Term Urbanization Pattern

### 6.1.1 Future Development Scenarios

Development scenarios were examined to forsee the possible urbanization pattern in 2000 based on the two alternative urbanization patterns in 1990. Six development scenarios were formulated:

Scenario 1

The Pasir Gudang new development pole is the biggest urban development in Johor State which is handled by State Economic Development Cooperation (SEDC). After the completion of the project being expected by 1990, SEDC may be able to carry out another big urban project in order to stimulate Economic and Social Development. The region to the West of Johor Bahru may have good potential for the public sector's investment in the long term prospect.

Scenario 2

Both Malaysian and Johor State governments have been strongly promoting rural development in the state and it is expected that the promotion will be effective in increasing population in the rural area. The policy to promote the development of rural area should be maintained even after 1990 in order to stabilize the rural population, since private sector will presumably be in favour of urban area. Consequently the growth of major rural towns such as Pontian, Pekan Nenas, Ulu Tiram, Kota Tinggi will be expected to be growth poles while metropolitan Johor Bahru will maintain a moderate urbanization growth.

Scenario 3

The construction of major infrastructures in Johor Bahru - Pasir Gudang corridor such as Johor Port, Port Access Road, Toll Express Way and the extention of Malayan railway will contribute to raise urban development potential of the area concerned. Many housing development projects have already been applied. If there is no control by the government over development by the private sector and assuming that the Malaysian economy remains stable, there is a high possibility that a continuous urbanization along Johor Bahru - Pasir Gudang corridor will occur.

Scenario 4

Rapid urbanization in the corridor by 1990 will suggest a further expansion of the urban area and an an increase in density in the next decade. If the strong pressure for development can be directed to other areas, the corridor may achieve moderate speed of growth so that the construction of necessary infrastructure can catch up. The region to the west of Johor Bahru has good potential for new urban development initiated by public sector. Thus, consequently the scenario may show an urbanization pattern similar to that of scenario 1.

Scenario 5

By 1990 the development will be concentrated in the corridor area. The rural population may not be able to achieve planning target by that time since considerable outmigration of rural population is expected. This implies that the government, in such case, will find it necessary to reinforce the rural development policy after 1990 which will presumably encourage the stablized growth

growth of major rural towns. This scenario leads to the urbanization pattern similar to that led by scenario 2.

Scenario 6

Increase of employment opportunity, urban amenity, and population generated by the development concentrated in the corridor by 1990 will in effect pull more population into the area, even after 1990. If there is not much change in the government development policy, the expansion of the corridor as well as the formation of density inhabited urbanization will result. This scenario results in a concentrated urban pattern similar to scenario 3.

### 6.1.2 Urbanization Pattern Alternatives

Three typical urbanization patterns were formulated after examination of six development scenarios.

Alternative I : West Expansion Pattern

This pattern emphasises the development of the region to the west of Johor Bahru town.

Alternative II : Dispersal Pattern

More local town developments are emphasised in the plan, other than the other two alternatives. Increase in population supported by the committed projects is, more or less taken into consideration.

Alternative III : Concentrated Pattern

The pattern supports further expansion of the urban area and increase in density of the Johor Bahru town within the corridor.

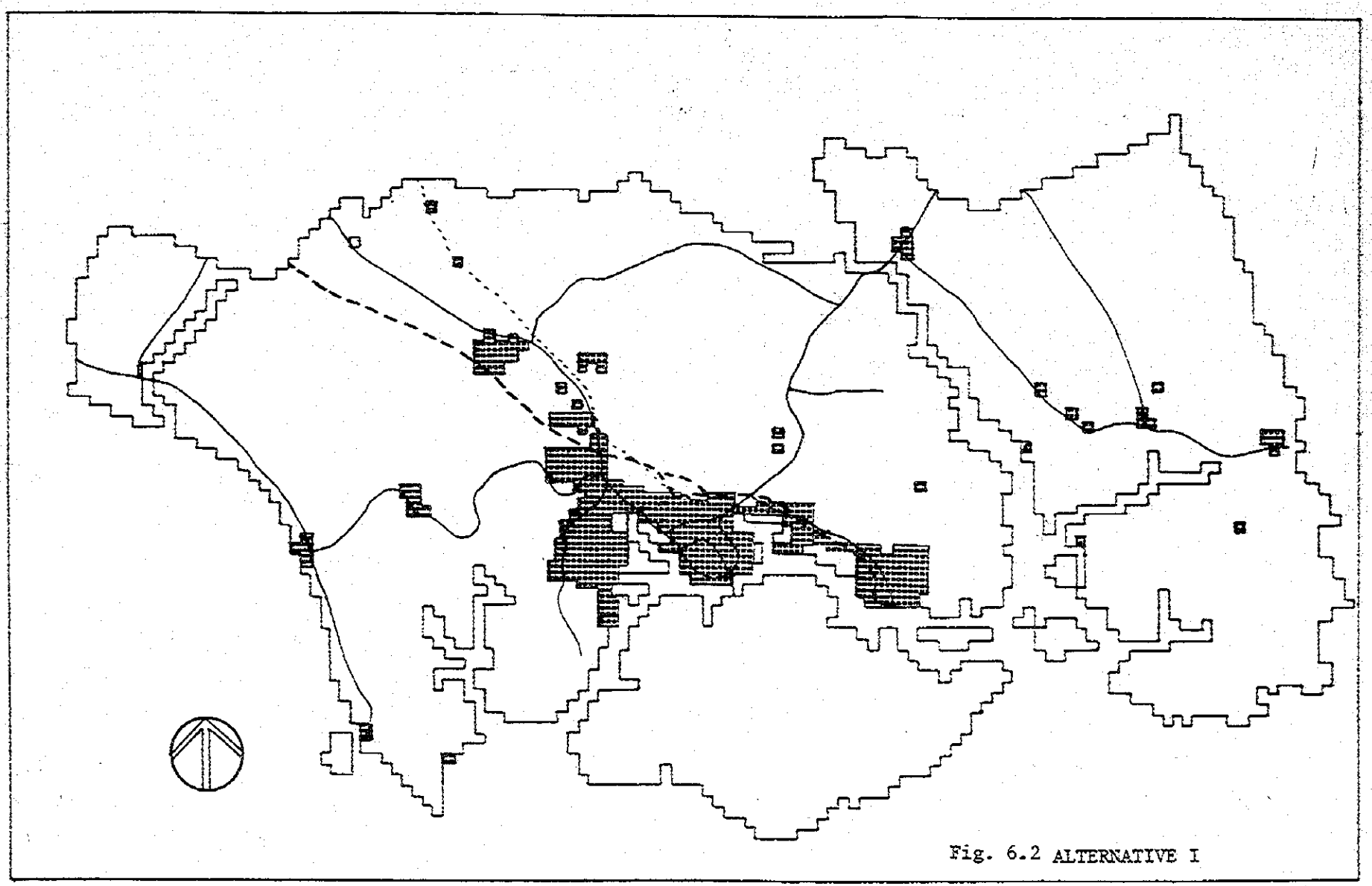


Fig. 6.2 ALTERNATIVE I

URBAN AREA

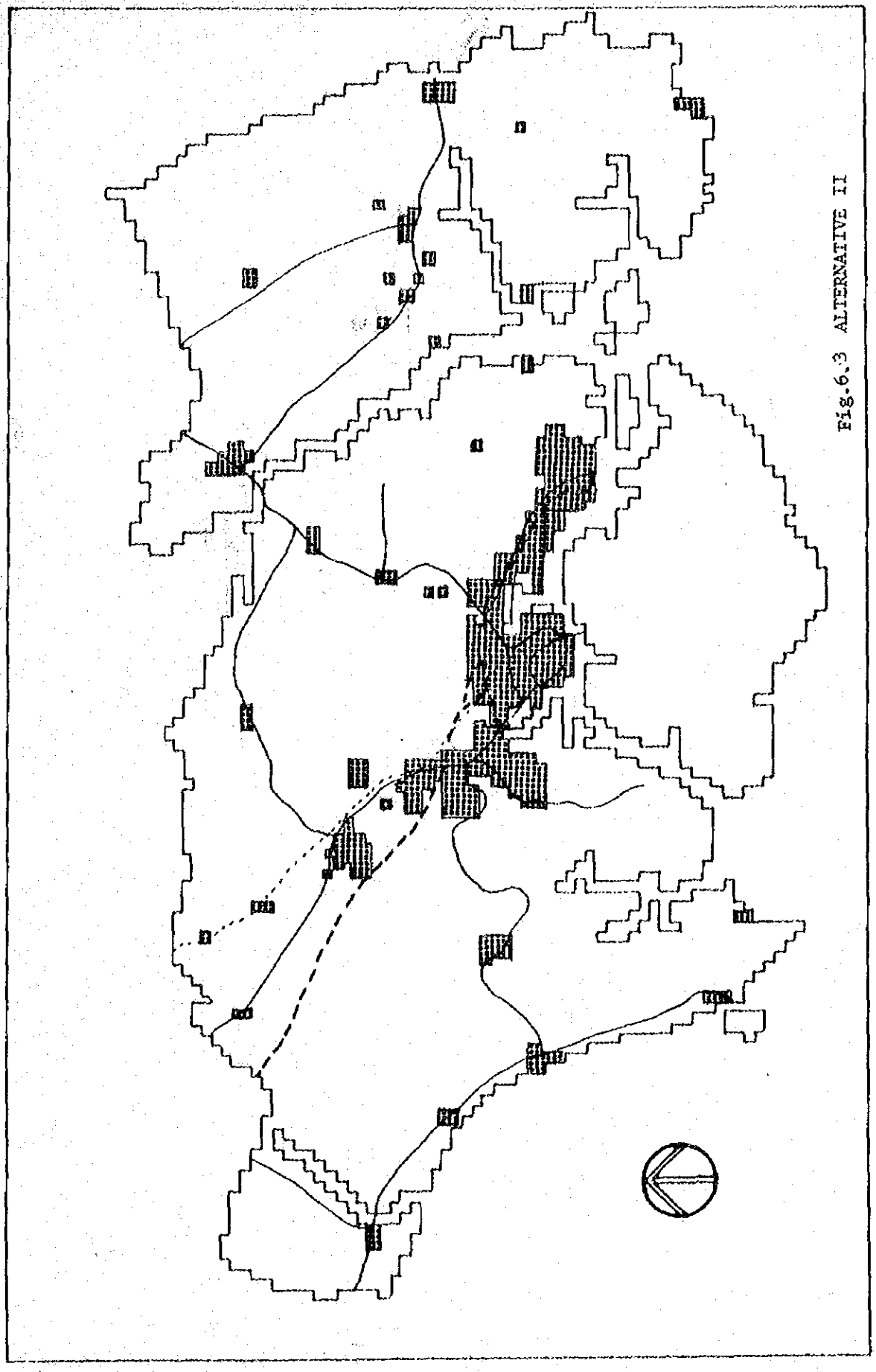



Fig.6.3 ALTERNATIVE II

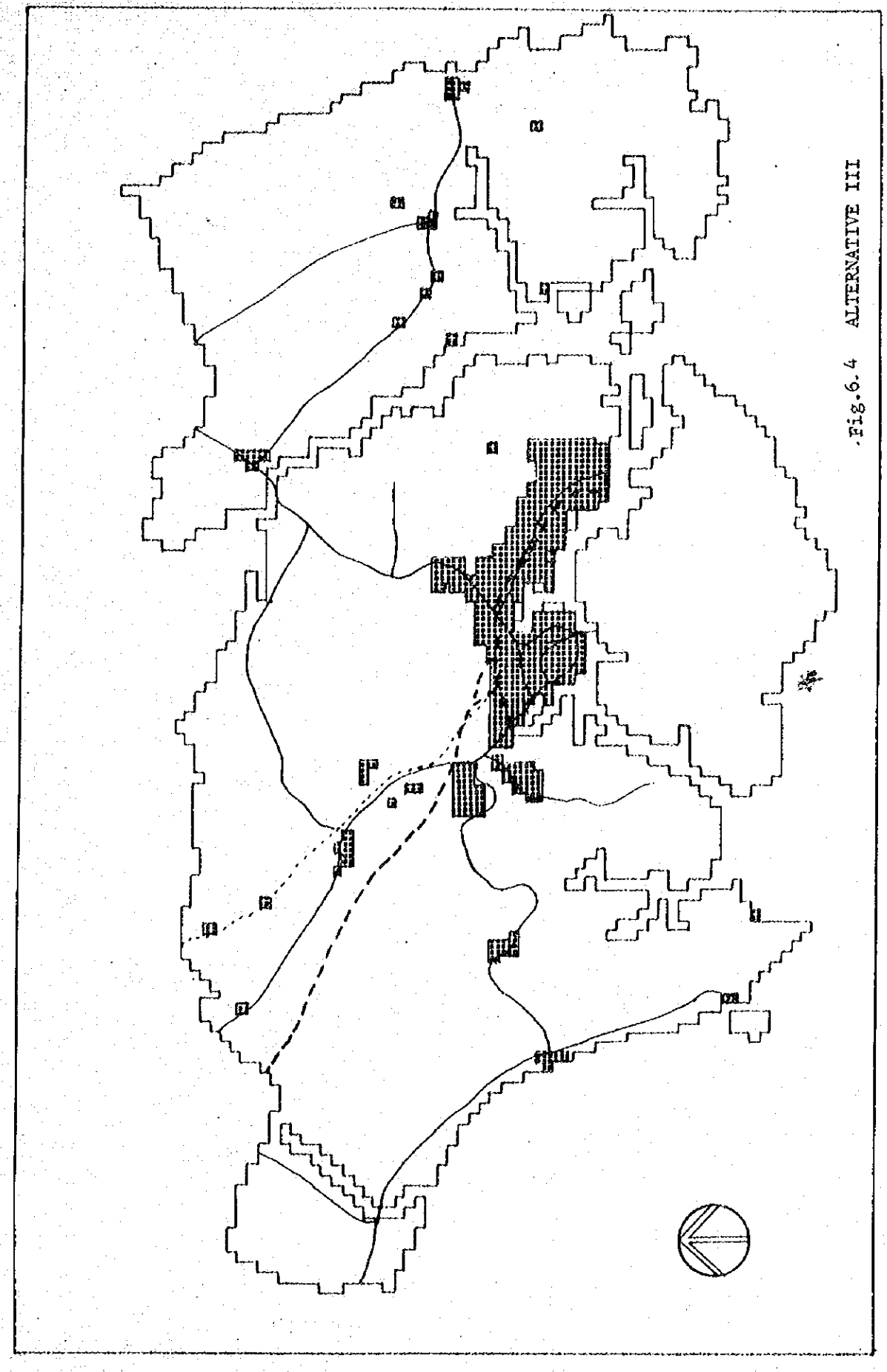



Fig.6.4 ALTERNATIVE III

### 6.1.3 Evaluation of the Alternatives

The state department of town and country planning has formulated the target population of 950,000 in the metropolitan area in year 2000. The urbanization pattern proposed by the department is formulated based on the serious consideration of future capacity of approved projects which are more or less already under construction at various stages.

The inputs from the department to our study have facilitated the evaluation of the alternatives in this stage and for the time being, alternative II was selected based on the following reasons;

1). The urbanization pattern proposed by the department is very similar to the pattern of alternative II.

2). The department evaluated the most likely population in year 2000 to be 850,000, while the estimated capacity of population of approved projects reached up to about 935,000.

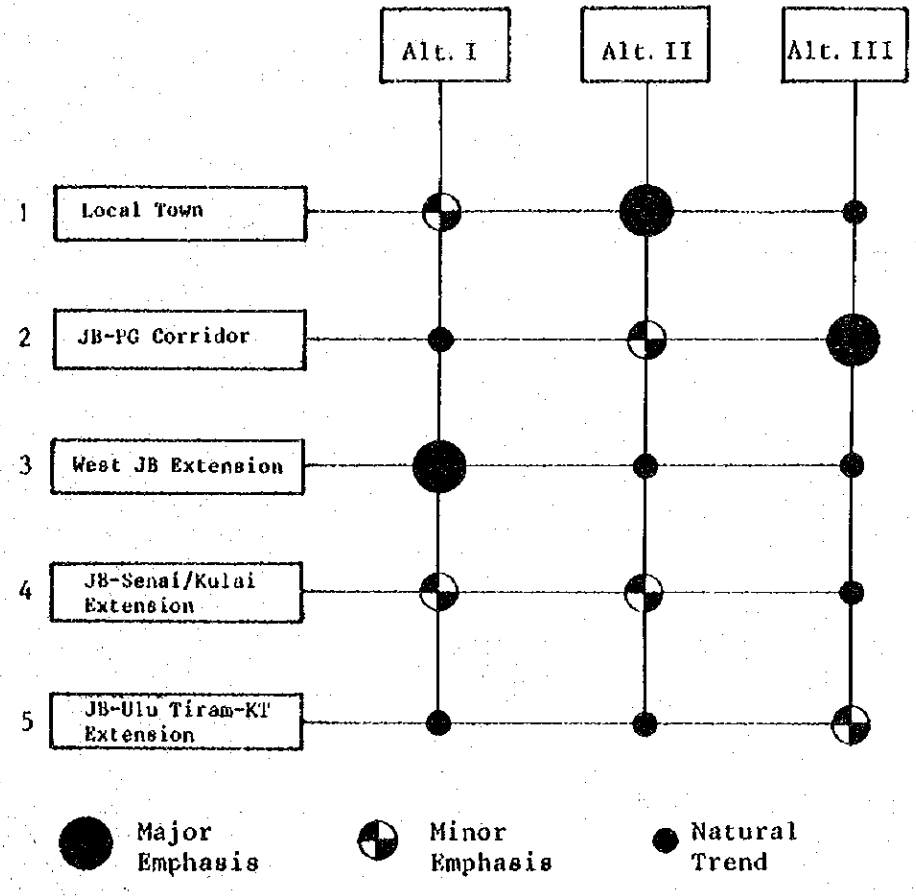
Eventhough the population pressure may exceed the estimated population of about 850,000, the excess 85,000 can still be involved in the approved project areas. In the case of the study team's estimation of about 810,000, an additional population of 125,000 can be accepted in the project areas.

The magnitude of population capacity of the approved projects over the two estimations by the department of town and country planning an our study team is enough to eliminate alternative I and III, since alternative I assumes the redistribution of urban space for the estimated population and alternative III, the development of additional urban space out of approved projects in the corridor which is needed to accomodate the additional population in the estimation.

3) State department of town and country planning expressed their policy that they will take into serious consideration the approved projects in the formulation of a structure plan to be proposed.

This implies that future urbanization pattern will be much dependent on the location and size of the approved projects. Alternative II is formulated on the basis of the distribution of the approved projects.

Fig. 6.5 Emphasis On Urbanization Policy



## 6.2 Concept Plan

A structural concept plan for the Study Area is formulated by means of the integration of the urbanization pattern selected and the road network concept which is discussed in the road planning section.

### 6.2.1 Urbanization Pattern in 2000

The urbanization pattern follows the population distribution pattern as a whole. Metropolitan Johor Bahru which involves major locations of population such as Senai/Kulai - Johor Bahru corridor and Johor Bahru - Pasir Gudang corridor accumulate about one million population or 74% of total population. The population density which is 3.15 person/ha in 1980 in the metropolitan area will be expected to increase at 8.46 person/ha in 2000. In MPJB, it is estimated to be 33.42 person/ha and 52.35 person/ha in 1990 and in 2000 respectively. This implies that MPJB will have a considerably high density in the future. This will create a complex type of land use, just as a typical urban center of one million city.

Table 6.1: Future Population in the Study Area

| | | 1980 (x 1000) | 1990 (x 1000) | 2000 (x 1000) |
|---|---|---|---|---|
| Primary Area | MPJB | 247.0 | 398.5 | 520.0 |
| | Other Area | 211.9 | 309.5 | 546.9 |
| | Sub Total | 458.9 | 708.0 | 1,066.9 |
| Secondary Area | Kota Tinggi District | 39.0 | 55.9 | 81.6 |
| | Pontian District | 121.7 | 164.7 | 201.9 |
| | Sub Total | 160.7 | 220.6 | 283.5 |
| Total | | 619.6 | 928.6 | 1,350.4 |

Source: Study Team Estimate 1981, Population Section.

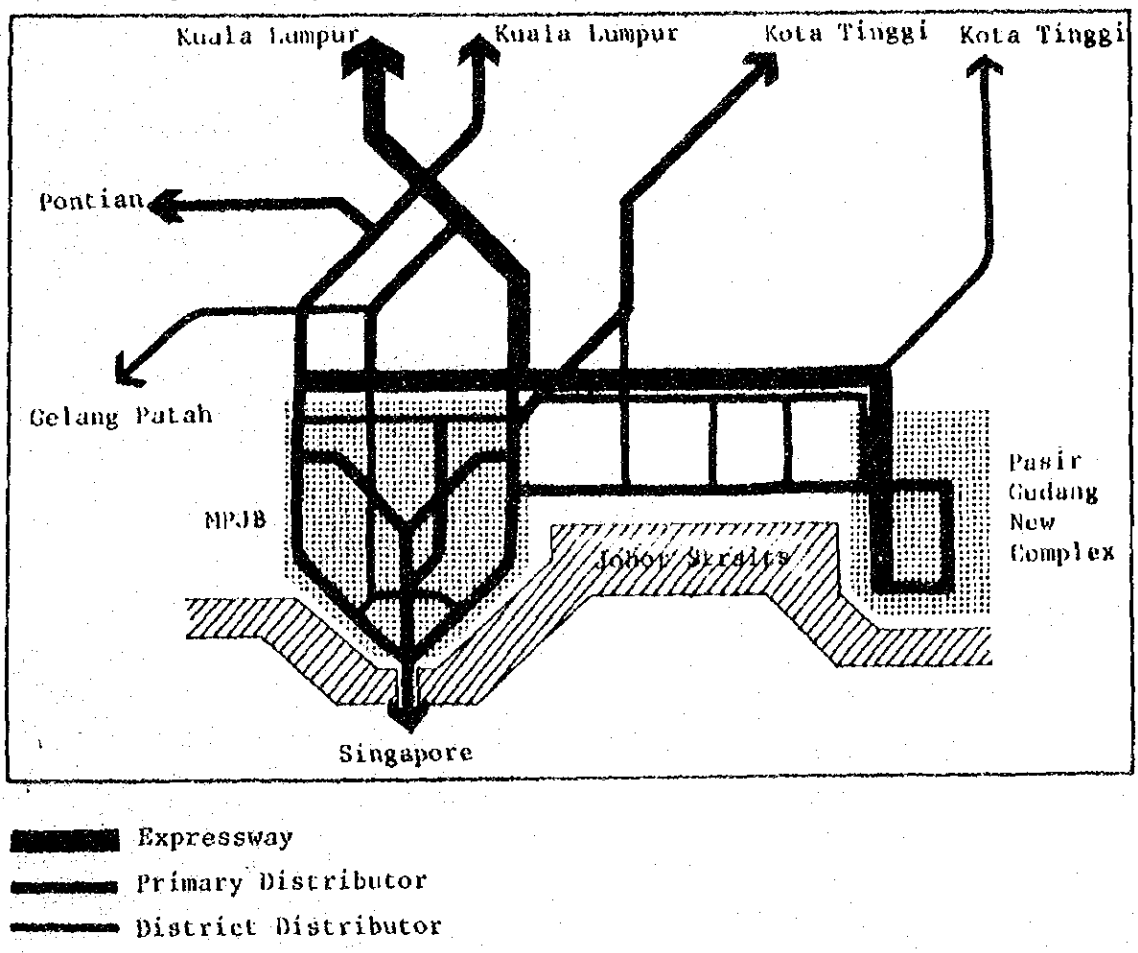
Table 6.2: Urban Population and Density

| | Land Area (ha.) | 1980 | | 1990 | | 2000 | |
|---|---|---|---|---|---|---|---|
| | | Pop(x1000) | Density | Pop(x1000) | Density | Pop(x1000) | Density |
| Metropolitan Johor Bahru | 112,760 | 381 | 3.38 | 615 | 5.45 | 954 | 8.46 |
| MPJB | 11,940 | 247 | 20.69 | 399 | 33.42 | 520 | 43.55 |

### 6.2.2 Road Network Concept in 2000

Conceptual pattern of road network system is planned as a ladder type in Johor Bahru - Pasir Gudang corridor, and an irregular mesh type in Johor Bahru - Senai/Kulai corridor. The Toll Express Way and the Port Access Road form an inter city network, and Federal Route 1 and other major roads compose a district distributor network. The conceptual diagram of the network system is shown below;

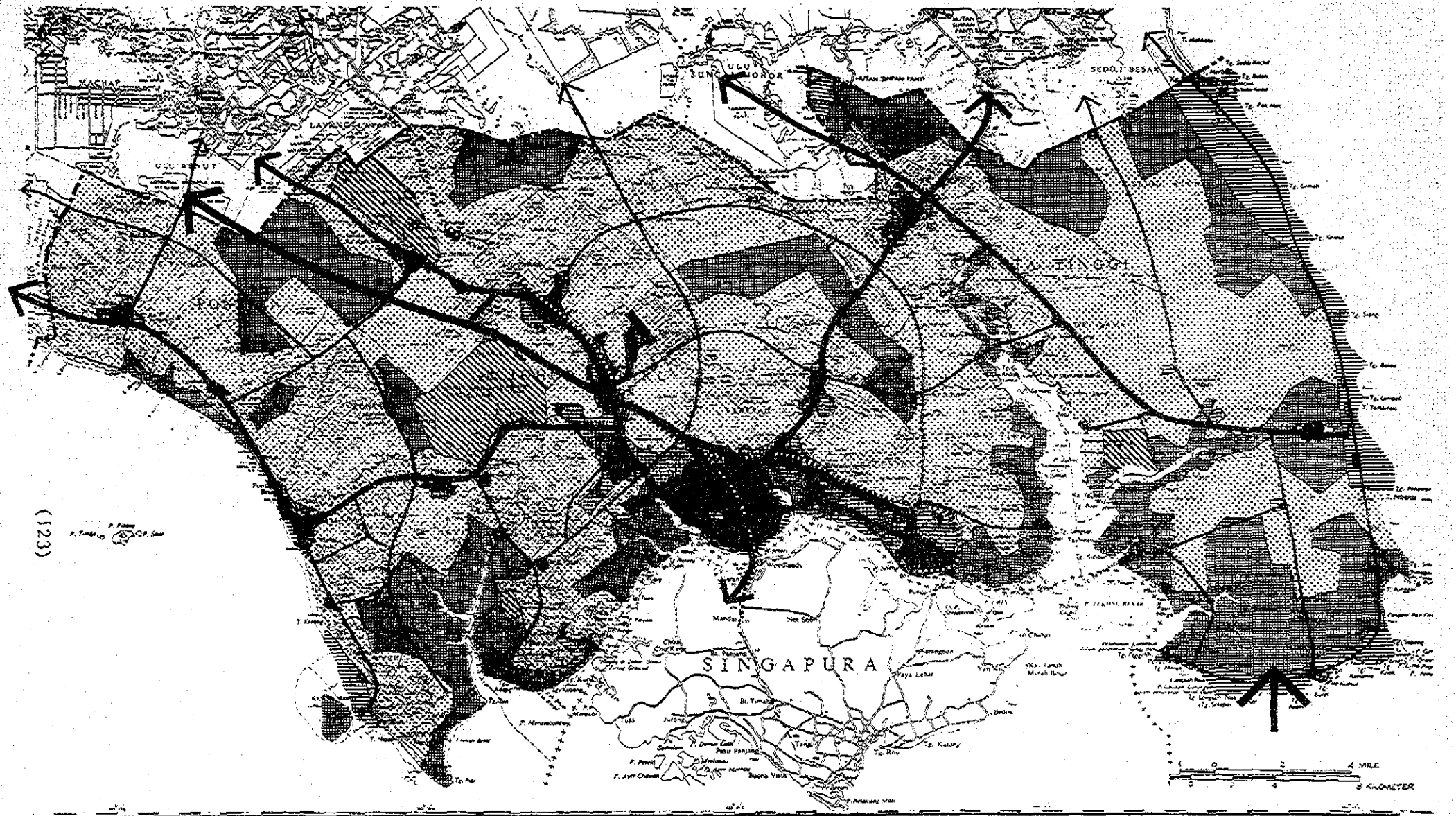
Fig. 6.6 Conceptual Diagram of the Future Network



### 6.2.3 Conceptual Development Plan

The concept plan for the Study Area is finally formulated by means of integration of urbanization Pattern II and road network concept pattern. This pattern is planned based on an assumption that existing causeway function and related area may be durable for future increase of traffic demands with the possibility of improvement. This plan is subject to the revision, when a drastic change will be necessary for the better solution of the traffic problem.

The plan, as a whole, shows a pattern of a linear urban belt in Senai/Kulai - Johor Bahru - Pasir Gudang corridor area, while several rural centres such as Pontian, Pekan Nenas, Kota Tinggi, Bandar Penawar are also expected to grow up.




(123)

# URBAN TRANSPORT MASTER PLAN STUDY FOR THE JOHOR BAHRU CONURBATION, MALAYSIA.

LEGEND:

- EXISTING URBAN AREA (1980)
- FUTURE URBAN AREA (BY 2000)
- NATURE RESERVE AREA (WATER CATCHMENT/FOREST)
- AGRICULTURE AREA
- RECREATIONAL AREA
- OTHER RESERVED AREA (SWAMP, GRASSLAND, MALAY RESERVE, etc)

TITLE: CONCEPTUAL DEVELOPMENT PLAN: 2000

- EXPRESSWAY
- DISTRIBUTOR ROAD
- RAILWAY

MAP NO.

FIG. 6.7

Table 6.3 : Urban and Agricultural Land Requirement in 2000

| | | | Future Urban Area 2000 (ha) | Non-Urban Area (2000) | | Total (ha) | Total Land Use Area (ha) |
|---|---|---|---|---|---|---|---|
| | | | | Agriculture Area (ha) | Non-Agriculture Area (ha) | | |
| Primary Area | Johor Bahru | MPJB | 11,643 | 0 | 297 | 297 | 11,940 |
| | | Plentong | 5,509 | 14,170 | 603 | 14,773 | 20,282 |
| | | Senai - Kulai | 1,676 | 30,234 | 11,365 | 41,599 | 43,275 |
| | | Other Area | 2,954 | 66,210 | 33,580 | 99,790 | 102,744 |
| | | Sub Total | 21,782 | 110,614 | 45,845 | 156,459 | 178,241 |
| | Kota Tinggi | Kota Tinggi | 904 | 25,293 | 12,884 | 38,177 | 39,081 |
| | | Others | 112 | 19,768 | 11,212 | 30,980 | 31,092 |
| | | Sub Total | 1,016 | 45,061 | 24,096 | 69,157 | 70,173 |
| | | Total | 22,798 | 155,675 | 69,941 | 225,616 | 248,414 |
| Secondary Area | Pontian | Pontian Kecil | 1,058 | 9,599 | 2,114 | 11,713 | 12,771 |
| | | Others | 1,140 | 57,224 | 25,968 | 83,192 | 84,332 |
| | | Sub Total | 2,198 | 66,823 | 28,082 | 94,905 | 97,103 |
| | Tanjong Penggerang | | 1,589 | 64,911 | 58,742 | 123,653 | 125,242 |
| | | Total | 3,787 | 131,734 | 86,824 | 218,558 | 222,345 |
| Study Area Grand Total | | | 26,585 | 287,409 | 155,765 | 444,174 | 470,759 |

Source : The Study Team Estimate (1981).

### 6.2.4 Landuse Pattern in 2000

#### Urban Land Distribution Pattern

* Total urban area will be expected to increase 11,000 ha. during next two decades, of which 77% will concentrate in Johor Bahru District and 67% in metropolitan area.

* The residential area in Johor Bahru District will share almost 75% of total increment of residential area which is estimated at 6,306 ha.

  The industrial area is :

  86% of total industrial increment, and

  84% of total commercial increment for the district.

Table 6.4 : Urban Landuse Pattern in 2000.

| | | | Existing Urban Area 1980 (ha) | Residential (ha) 1980-2000 | Industry (ha) 1980-2000 | Commerce (ha) 1980-2000 | Other Land Use (ha) 1980-2000 | Total Urban Area Increment (ha) 1980-2000 | Future Urban Area 2000 (ha) |
|---|---|---|---|---|---|---|---|---|---|
| Primary Area | Johor Bahru | MPJB | 7,502 | 2,458 | 465 | 262 | 956 | 4,141 | 11,643 |
| | | Plentong | 2,796 | 1,262 | 689 | 136 | 626 | 2,713 | 5,509 |
| | | Sensi-Kulai | 1,117 | 312 | 98 | 20 | 129 | 559 | 1,676 |
| | | Other Area | 1,827 | 677 | 176 | 14 | 260 | 1,127 | 2,954 |
| | | Sub Total | 13,242 | 4,709 | 1,428 | 432 | 1,971 | 8,540 | 21,782 |
| | Kota Tinggi | Kota Tinggi | 462 | 313 | 20 | 7 | 102 | 442 | 904 |
| | | Others | 30 | 47 | 13 | 3 | 19 | 82 | 112 |
| | | Sub Total | 492 | 360 | 33 | 10 | 121 | 524 | 1,016 |
| | Total | | 13,734 | 5,069 | 1,463 | 442 | 2,090 | 9,064 | 22,798 |
| Secondary Area | Pontian | Pontian Kecil | 167 | 607 | 61 | 17 | 206 | 891 | 1,058 |
| | | Others | 498 | 347 | 108 | 39 | 148 | 642 | 1,140 |
| | | Sub Total | 665 | 954 | 169 | 56 | 354 | 1,533 | 2,198 |
| | Tanjong Penggerang | | 1,172 | 283 | 24 | 14 | 96 | 417 | 1,589 |
| | Total | | 1,837 | 1,237 | 193 | 70 | 450 | 1,950 | 3,787 |
| Study Area Grand Total | | | 15,571 | 6,306 | 1,656 | 512 | 2,540 | 11,014 | 26,585 |

Source : The Study Team Estimate (1981).

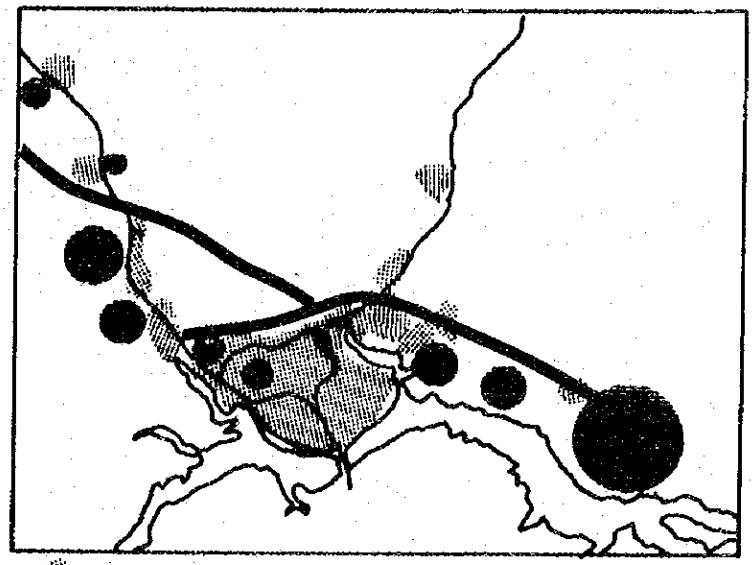
## Location Policy for Landuse Plan in the Metropolitan Area

The landuse development pattern in the metropolitan area along the guideline of the conceptual development plan. The pattern shows the possible locations of the housing development, the industrial, the commercial centers and the nature conservation.

* Housing Development

The housing development pattern can be considered in two aspects; the estate type of the development which is now common in Johor Bahru metropolitan area and the small-scale developments which expand into the open space and the outskirts of existing town areas. Many high-rise housing will be built in MPJB in the context of the urban renewal and the squatter resettlement projects.

Fig. 6.8 Housing Development Pattern

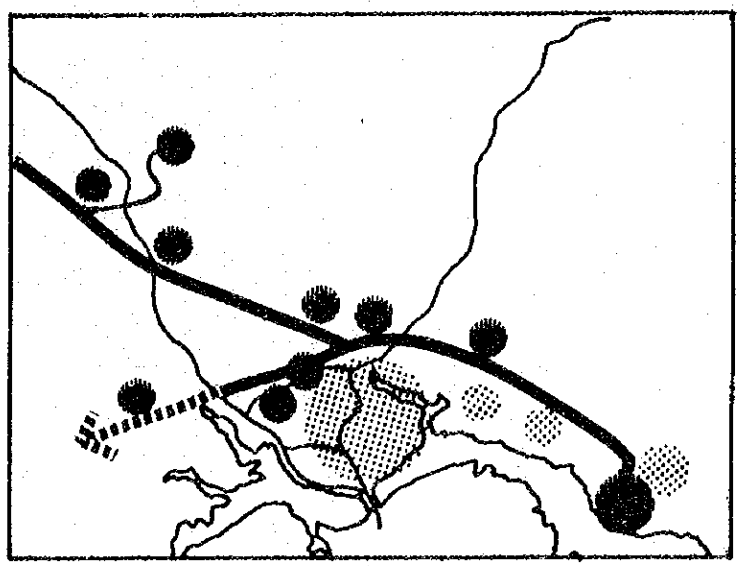


Small-scale housing development
Estate Development

* Industrial Development

The pattern of industrial development will also appear in the estate type and the small-scale type. The estate type of development can be preferably located along the port access road in conjunction with a better lingkage with Johor Port, Senai Airport, and the other regional and national centers. The small-scale type will be scattered in the existing urban area and some of the housing estates.

Fig. 6.9 Industrial Site Distribution



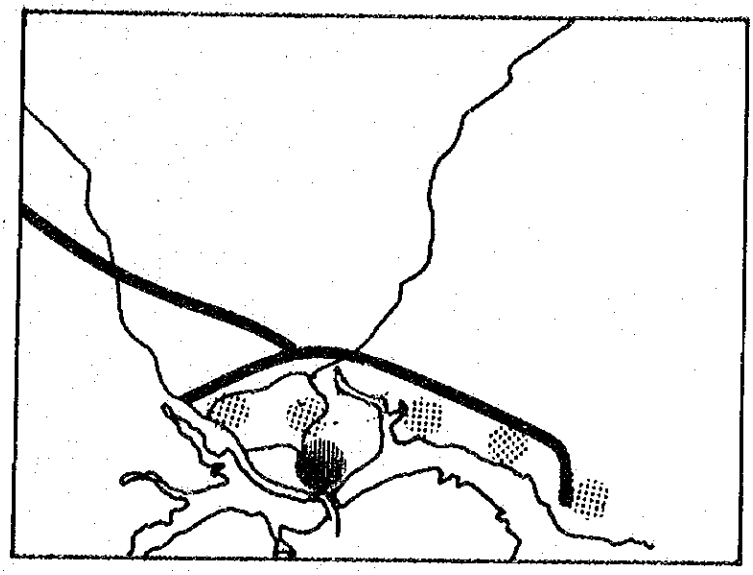
● Estate Site

▨ Small-scale industry

* Commercial Center

Future Johor Bahru will be necessary to be provided with the central business district, in order to facilitate regional, national and somewhat international level of commerce and business activities in the metropolitan region. This requires the comprehensive development program for CBD in Johor Bahru in which the planning for pedestrians and beautification of the urban environment should be included. Other commercial centers will be planned in conjunction with the housing estate developments and the Pasir Gudang project.

Fig. 6.10 Future possible Location of CBD and Commercial Centers



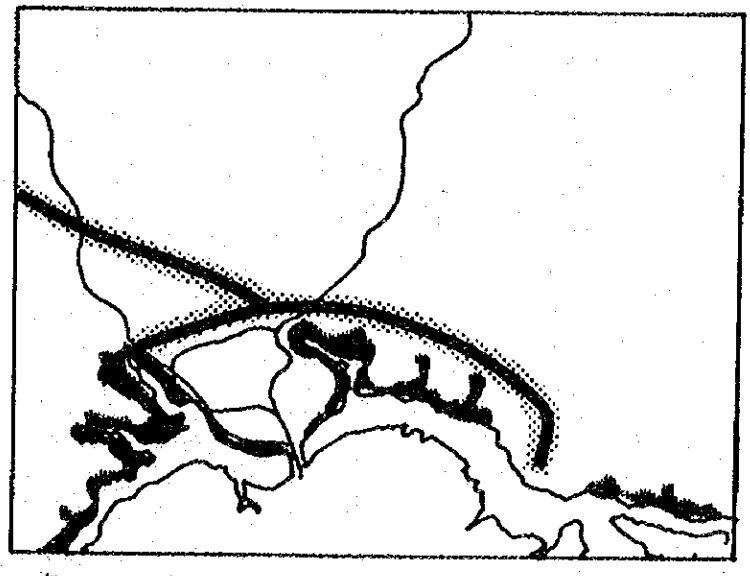
Johor Bahru C.B.D.

Commercial Centres

* Nature Conservation

It is important for the long-term planning to include a plan for conserving the nature and open space for physical and pschycological well-being. The environmental infrastructure which comprises of coastal green and parks; and buffer green of the expressway should be planned.

Fig. 6.11 Coastal and Buffer Green to be Conserved



Coastal Green Zone

Buffer Green

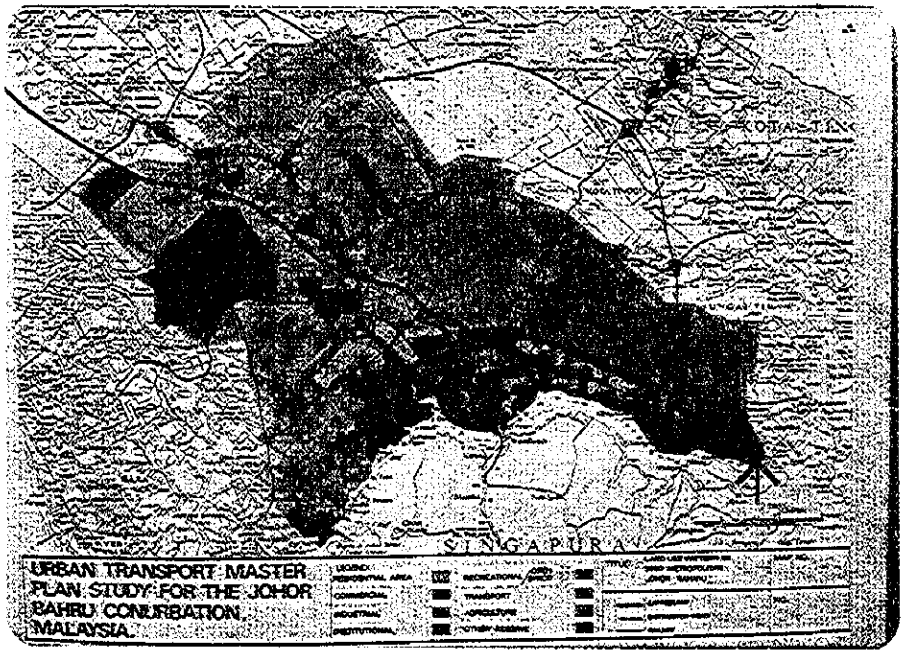



Fig. 6.12 Landuse Pattern in 2000 Metropolitan Johor Bahru

# APPENDIX

APPENDIX I HISTORICAL DEVELOPMENT OF JOHOR BAHRU - CHRONOLOGICAL PERSPECTIVE

APPENDIX I

# THE HISTORICAL DEVELOPMENT OF JOHOR BAHRU - CHRONOLOGICAL PERSPECTIVE

## 1.0 ORIGIN OF TANJUNG PUTERI (PRINCESS CAPE)

The historical origin of Tanjung Puteri, formerly a hilly cape commanding a scenic view of the Straits, was recorded during the reign of the Johor - Riau Malay Empire as well as in legends of ancient Negeri Sembilan and Melaka. According to one Naning legend, while out hunting one day, Nenek Bangkong from Ulu Jelebu, stumbled upon a beautiful little girl in a cave. Nenek Bangkong adopted the child and changed her name from Princess Mayang Selida to Bantin Seribu Jaya. She also changed her name to Nenek Bercangai Besi. When the Princess Bantin Seribu Jaya grew up, she married Prince Cahaya, the son of Sultan Abdul Jalil of the Johor - Riau Empire.

It was in honour of the arrival of the Princess at the cape that the name of 'Tanjung Puteri' (literally meaning Princess Cape) was given. It was in this straits waters which was calm and clear that the Princess and her maids bathed and played.

Today, much of the hilly terrain has been levelled for the construction of the Customs Complex but some traces of the beauty of its natural surroundings can still be perceived.

## 2.0 THE ORIGIN OF ISKANDAR PUTERI[1]

On March, 10th. 1855, Sultan Ali ibni Sultan Hussain Shah signed an agreement, conceding the entire Johor State (with the exception of Kesang) to Temenggong[2] Ibrahim. Locating an ideal site South of Johor to be developed into a town, the Temenggong and his officials landed on Tanjung Puteri[3] (literally meaning Town of "Princess Iskandar"). The development

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1. Iskandar Puteri renamed from Tanjung Puteri was also the old name given to Johor Bahru.
2. Temenggong refers to a high dignitary official in the Malay government at that time.
3. A monument was built in 1955 to commemorate the Diamond Jubilee, by Sultan at the exact spot where the Temenggong landed.

of Bandar Iskandar Puteri was carried out from the Temenggong's headquarters at Teluk Belanga, Singapore.

There are several reasons contributing to the selection of Tanjung Puteri as the ideal site for the development of the town. They are viz :-

(1) The region is not only well-drained by many rivers[4] that flows through it but also of its valleys and hills[5] that are ideal for gambier, black pepper, cloves, tea and coffee-growing;

(2) Ideal location for the development of a port as it is well sheltered from the tidal waves and strong currents.

(3) Proximity of the town to Teluk Belanga which facilitates administration and governing of the town by th Temenggong.

(4) Envisaged good trade prospects due to its proximity to Singapore, the flourishing trade centre at that time.

In the same year, the Temenggong built a mansion on a hill[6] which was later called 'Bukit Bendera' or 'Bukit Timbalan'. At that time, there were no trading or commercial acitvities in the area with the exception of a house built to accomodate officers in charge of the construction workers and a prison. Trading rights for opium and liquor were given to a Chinese man by the name of Chiang Tieu. En. Perang b. Md. Saleh b. Perang (who was Datuk Bentara Luar), was put in charge of preventing the smuggling of opium into Johor State. It can be mentioned in brief, that much of the town's development and progress are attributed to the efforts of such administrators like En. Abdullah b. Tuk Md. Tahir (better known as En. Long) and also En. Jaafar b. Hj. Muhammad's uncle who was the first Chief Minister.

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4. Important rivers are the Sg. Segget, Chat, Air Molek, Skudai, Pasir Pelangi and Tebrau.

5. Prominent hills include Bukit Seri Gambir, Ledang, Seri Kopi, Chagar, Bendera (Timbalan), Seri Manggis, Seri Cengkih and Bintang.

In 1856, at the age of 20, Temenggong Abu Bakar, eldest son of Temenggong Ibrahim was put in charge of interfacing and acting on all matters relating to Europeans and the British Government in Singapore.

In 1858, upon his father's consent, Temenggong Abu Bakar gradually transfer the government to Bandar Iskandar Puteri. The cousin of Temenggong Abu Bakar was made Resident General of Iskandar Puteri. Together with Temenggong Abu Bakar's assistance, they not only started the Government Office but also organised the Police Force. The first Government office was set up beside the straits, at the end of Jalan Trus.

The laws and regulations were adopted from British Laws as used in Singapore at that time En. Long remained in Teluk Belanga whereas Temenggong Abu Bakar and his officers commute to and from Iskandar Puteri as other members of the royal family, inclusive of his mother, were still residing at Teluk Belanga. Owing to increasing workloads, the Temenggong requested En. Long to send En. Md.Saleh b. Perang (Datuk Bentara Luar) as chief clerk to Engku Cik Ahmad in Bandar Iskandar Puteri. The reason why most court cases were from the Chinese was due to the fact that approximately 20 settlements on the river banks were set up by the Chinese for growing gambier and black pepper. In these settlements, the chinese used the Kancu system[6] for maintaining peace and order. One of the Kancu Chief was Tan Hiok Nee (Datuk)[7] who stayed in Jalan Trus.

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6. Kancu has the literal meaning of chief of the riverbank dwellers and the chief are usually nominated from the farmers themselves.

7. He was later bestowed the title 'Mayor' or 'Kapten' of the chinese and he was the first chinese in Johor State to be given the title 'Datuk'.

## 3.0 THE BEGINNING OF JOHOR BAHRU[8]

### 3.1 AN OVERVIEW

After Temenggong Ibrahim had passed away and subsequently, buried in Teluk Belanga on January, 31st. 1862, he was succeeded by Temenggong Abu Bakar as the ruler of the Johor Government. It was during the same year that a rapid pace of road development prevailed. The rapid economic development coupled with increased revenue from the growing of gambier and black pepper on more than 70 river banks, had yielded approximately 3000 kawah[9].

It was in early January, 1866 that the name of the town of Iskandar Puteri was officially changed to Johor Bahru (meaning New Johor) by Temenggong Abu Bakar.

As Johor Bahru became more densely populated and as more new lands were opened up for development, the task of maintaining peace and order became heavier. In 1868, En. Md. Saleh b. Perang was promoted to the post of Commissioner of Police. Besides, the duties of Chief of Police, he also issued gambier and black pepper gerans to farmers, pawn litters, transaction documents and credits relating to gambier and black pepper holdings. He was also held responsible not only for surveying and determining the boundaries of farms, but for resolving land disputes.

It was En. Md. Saleh's efforts that a road was built linking the town and Sg. Pandan (viz. Jalan Trus to Jalan Tebrau). Another long stretch of road was built from Johor Bahru town along the coast in front of the istana, foothills of Bukit Cengkih, along banks of Sg. Chat and foothills of Bukit Menara Empat (the present Straits View Hotel) and straight to Skudai.

In 1874, Engku Sulaiman b. Daud (relative of Temenggong Abu Bakar) was appointed Deputy Commissioner of Police. Besides, being able to concentrate more on the gambier and black pepper industry, En. Md. Saleh

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8. Bandar Iskandar Puteri was renamed Johor Bahru in 1866

9. Kawah, literally meaning cauldron, was used as a means of measurement.

b. Perang also became the Chief Engineer. After surveying the entire Johor State, he was able to complete the map of Johor in Jawi after 3 years and in English in 1907. The map was finally approved by experts in London in 1914.

3.2 SETTLEMENT PATTERN IN JOHOR BAHRU.

Most houses in Johor Bahru at the time of Temenggong Abu Bakar's reign were raised on concrete pillars. This is because the area around Johor Bahru was low lying and swampy, especially the areas around Sg. Segget, Jalan Wong Ah Fook, the river mouth of Sg. Air Molek, foothills of Bukit Zahrah and Timbalan.

Most of the chinese population stayed in rented shophouses while others resided in association houses (Kongsi). As for the Malays, they live in kampungs or villages along the coast and valleys stretching from the front of Main Palace to kampong Dock.

At the foothills of Bukit Zahrah and the area in the vicinity of the Main Palace and the Semayam Palace is the settlement of kampong Kandang Ayam. It was here that Johor's leading Malay school was situated. Besides, this settlement, others include kampong En. Isa in Stulang Laut and Kampong Pahang and Kampong En. Melulart in the town itself.

3.3 PALACES AND HIGH OFFICIALS' RESIDENCES

After the renaming of Johor Bahru, Temenggong Abu Bakar embarked upon the task of building royal palaces. The first to be built was Istana[11] Besar and this was followed by others like Istana Zahrah, Balai Cingkih, Istana Semayam, Istana Pantai (Gedung Menara Empat), Istana Marble and Istana Tasik Utara.

Senior Officials' residences were built around Istana Zahrah. The chief Minister's house[10] 'Seri Gambier' which was still existing was situated along Jalan Gertak Merah (between Jalan Datuk Menteri and Jalan Mustafa). As for Datuk Yahya b. Awaludin's

10. The Chief Minister at that time was Datuk Jaafar b. Hj. Muhammad.

11. Istana means royal palaces.

house, it is now being occupied by the Johor Tutorial College. Datuk Yahya b. Shaaban Al-Data's house at Jalan Yahya Awal is no longer existing and so was Datuk Muhammad Istiadat's house in Jalan Gertak Merah which has been demolished. Datuk Abdul Rahman b. Andak (Datuk Seri Amar diRaja)'s house, which has the former name of 'Seri Lalang' and later called 'Istana Mastika Embun', is now the 'Tengku Ampuan Maryam' college. En. Md. Khalid b. Munsyi Abdullah's house which is no longer existing, was located along Jalan Datuk Dalam. Most of the other officials resided in places such as Jalan Ibrahim, Bukit Senyum and even along Jalan Tebrau.

### 3.4 SIGNING OF TREATY AND THE BEGINNING OF THE CONSTITUTION

On May, 24th 1885, Temenggong Abu Bakar and his senior officials sailed for England. It was on December, 11th. 1885 in London that a treaty based on mutual protection and friendship was signed between the Temenggong and Queen Victoria.

The treaty, primarily stressed on cooperation and promotion of trade relation and the protection of the State againist external interference. In other words, Johor has existed under the protection of the British government and in return, the Johor state recognised the sovereignity of England.

In 1895, Perak, Selangor, Negeri Sembilan and Pahang were amalgamated to form the Federated Malay States. It was only then that a set of Laws were applied to the Johor State.

On April, 14th. 1895, Sultan Abu Bakar and several of his ministers drew up a set of constitution for the Johor State.

### 3.5 BRITISH INFLUENCE IN JOHOR

Along the development of Johor, was the rapid pace of urbanisation and population increase. Not surprisingly, therefore, that the ruling of Johor became more demanding. As a result, in 1895, after Sultan Abu Bakar's death, his immediate successor, Sultan Ibrahim requested the Governor of the Straits to send a few British officers to help in the running of the state.

On January, 7th. 1910, D.G. Campbell was appointed the 1st. General Advisor of Johor. With this appointment, it was not long before various departments were headed by British officers. In other words, British influence became very significant particularly with the signing of a new treaty on 11th, May 1914 between Sultan Ibrahim and the Governor Sir Arthur Hendeson Young. The signing of the Treaty gave rise to the appointment of the 1st. British General Advisor to the Sultan. Not only were all proposals and ideas from the British Advisor to be abided but also that the State revenue was to be under his control.

## 4.0 TOWN BOARD

### 4.1 THE ORIGIN OF THE TOWN BOARD

Up till 1914 , no record was kept on the running and functions of the department. Nevertheless, the department was probably set up in 1910[12]. The revenue collected were mainly from sources such as house assessments, business licenses, dog licenses, water bills, etc.

In 1913 and 1914, the department was confronting a financial deficit in that their expenditure exceeded its revenue. Most of the expenditure were spent on construction of a new building for the department, barracks for labourers at Batu Enam, construction of embankments at Jalan Ibrahim, purchase of 2 waterwagons and the construction of minor streets and services roads.

In 1914, the department was headed by a committee comprising of Yang Dipertua, Timbalan Yang Dipertua,

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12. Source : J.Griffths, 'Annual Report, 1914'.

Chief Medical Officer, Chief Police Commissioner and other members like Datuk Mustafa bin Jaafar, Syed Sahil bin Ahmad, Engku Abdul Aziz bin Abdul Majid, Datuk Toh Ah Boon, En. Ah Yam, En. Syed Hassan bin Ahmad Al Atas and a Health Officer appointed as an additional member in early August 1914.

4.2 RULES AND REGULATIONS

In 1914, licences were imposed on approximately 293 trishaws, 190 buffalo-carts, 47 motor vehicles and 93 other vehicles. On September, 19th. 1914, the 'Jinrikisha Enactment' was drawn up and enforced in early January, 1915. Similarly, the 'Tractor Engines and Motor Vehicles Enactment' was enforced in early July, 1914.

5.0 STREETS AND UTILITIES

Even by 1914, the roads in Johor Bahru were still illuminated by oil-lamps hung on lamp-posts; the latter supplied by 'Messrs Sahil & Company' in Johor Bahru. Although some of the houses and shops were supplied with piped water, the overall situation was not satisfactory. Many still have to rely on wells for water supply.

The Town Board not only had demolished some houses which were considered unsafe for human habitation, but it has undertaken the task of approving the construction of 45 brick houses and 76 attap houses. The department had also undertaken the task of clearing the dumping ground on the banks beside Jalan Ibrahim and between Jalan Pahang and the Johor Hotel. A retaining wall was built along the coastline from the Johor Hotel right up to the end of Jalan Air Molek. Road names on signboards bearing the names of well-known persons or places such as Jalan Wong Ah Fook, Jalan Sultan Ibrahim and Jalan Tebrau were put up in their honour.

Backlanes were constructed behind shophouses along Jalan Segget[13]. Sewage disposal were by the bucket collection system whereby they were collected from

13. The cost of construction totalled a staggering figure of $7,312.17.

a total of 360 houses and loaded in a tongkang[14] to be disposed off in the sea, at a distance of a few miles from the coast.

In 1914, the kampungs or villages in Tebrau, Batu Enam, Segamat and Kota Tinggi came under the jurisdiction of the Town Board and so was the fire department.

## 6.0 INCREASING FUNCTIONS OF THE TOWN BOARD 1915 - 1918.

The next Yang Dipertua and Timbalan were John V. Thompson and Engku Ali bin Abdullah respectively. The Secretary was En. Osman bin Abdullah. The various towns under the jurisdiction of the department include Tebrau, Kota Tinggi, Keluang, Batu Enam and Segamat. The revenue collected in 1918 which totalled $107,929.19, were $16,996 more than the previous year. Although the expenditure amounted to $70,890 and there should be a net in-flow of money to the department, yet many households are devoid of piped water supply.

By 1918, offices and houses were increasing in number rapidly. A total of 158 houses were supplied with electricity and by now, backlanes were built for Kampung Ah Fook. The number of lights using oil-lamps were decreasing and were slowly being replaced by electricity.

Pertaining to the issuing of licences and permits, statistical records showed that as many as 314 trishaws, 41 horse carriages, 452 buffalo-carts, 30 push-carts, 99 eating shops, 103 coffee shops, 37 bakeries, 25 dhoby shops. etc, were having licenses. Most of the wooden shacks and other old buildings unsafe for human habitation were demolished.

From 1917 and 1918 onwards, the payment for motor vehicle licenses were transferred to the Police Department. By this time too, shophouses were increasing. The demand for land for development became so great that low-lying lands, south of the Police barracks were reclaimed for development.

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14. A kind of barge.

Alongside the rapid economic development, was the rapid continual increase of rental fee. The problem of escalating rents was brought to the attention of the Town Board which, in response to this problem, decided to draw up rent control acts and bye-laws.

With the enforcement of the dog licensing law, the number of dogs reared decreased after 1918. In 1918, the number of houses using the bucket disposal system have increased from 463 in 1916 to 509 houses. Comparatively, the number of trishaws had also increased from 279 in 1916, and the same is true with horsewagon, buffalo-cart and push-carts. At about the same time, applications for piped water supply have to be rejected in view of the shortage of water. This called for the subsequent installation of additional pumps to meet increasing demand on water consumption. As a matter of fact, by 1918, Johor Bahru had already in its possession 11 lincensed billard rooms and 16 shooting galleries.

## 7.0 PAST DEVELOPMENT

### 7.1 DEVELOPMENT OF JOHOR BAHRU 1919-1960

By 1919, there were still 16 attap houses in Johor Bahru. At this time, more roads were added to the network system and this includes the backlanes of Jalan Wong Ah Fook and west of Jalan Trus and a road linking Jalan Tan Hiok Nee to Jalan Dhoby. Food were still imported from Singapore and not surprisingly, its prices also increased two to threefolds the original prices. The demand for food were increased substantially particularly with the influx of people into Johor Bahru and Singapore after the First World War(1914-1918).

In the same year, 186 houses and government offices were equipped with electricity. The number of trishaws have also increased to 309, horse carriages to 33, buffalo-carts to 525, push-carts to 38, eating shops to 102, coffee shops to 114, bakeries to 43, dhobies to 36, hawkers and road-side stalls to 186 and 160 respectively.

At this time, a total of 150 acres of land at Jalan Kebun Teh was reserved as burial ground for different ethnic groups. The market at Sg. Segget was enlarged and sections of the cracked retaining wall were repaired.

## 2 DEVELOPMENT UNDER THE TOWN BOARD 1920-1925

In 1920, W.B.Y.Draper became the Yang Dipertua of the department. During his period of office, the number of houses and roads increased rapidly. The low-lying areas to the west and north of the Sg. Segget market were levied for land within the town area. By this time, revenue collected from electricity consumption increased 47½ as compared to the previous year. Oil-lamps were slowly becoming obsolete. Nevertheless, in rural areas within the municipality, such as Tebrau, Renggam, Keluang, Segamat, Buluh Kasap and Batu Enam were still relying on oil-lamps. Revenue from water consumption also increased by 50%.

Bakeries, boarding houses and lodgings further increased in number. Horse carriages for hire by this time, were no longer in use. In the same year, the buildings and depot for the government officers and staff of the Rent Assessment Committee, comprising the Yang Dipertua as chairman and other officers, were formed.

In 1925, with the rapid increase of the revenue relative to the expenditure, more buildings such as a cinema was built beside Sg. Segget. In the same year, the Town Board resumed its responsibility of collecting motor vehicle taxes. Revenue from taxes imposed on motor vehicles amounted to $20,761 and as for revenue from business licenses, it amounted to $4,802.30.

The population were increasing at a very fast pace. Using private vehicle ownership as one of the social indicator of wealth and prosperity, it can be

inferred that the standard of living had increased in Johor Bahru. With the increase of motor-vehicles on the roads, outnumbering buffalo-carts and trishaws, there was evidently the need to widen narrow roads.

7.3 THE OPENING OF THE JOHOR CAUSEWAY

Johor Bahru had experienced rapid growth due in part to the opening of the Johor Causeway in 1924. Trade flourished and the flow of traffic into the town increased tremendously. Therefore to ease the traffic congestion and to attract the tourists, the stretch of land along the coast and the road and leading to the town were beautified.

The total revenue collected in 1926 amounted to $230,880.04 and the expenditure totalled $124,938.72. Taxes on cars alone amounted to $41,929.00

In 1928, the revenue collected for cars alone were $83,458.00. By this year, there were 565 private cars, 495 hired cars, 259 lorries and 152 motorcycles.

7.4 THE JAPANESE OCCUPATION AND THE TOWN BOARD

During the period of the Japanese occupation, the Governor of Johor was M. Hami. The other officers were Zaimu Shuninkan, M. Ohmura and K. Suzuki. The Financial Commissioner was Datuk Abdul Rahman b. Md. Yasin. After the Japanese occupation which lasted 3 years and 8 months, the Town Board was back in commission.

In 1942, the officer-in-charge of the Town Board was Prince Tokugawa, a member of the Royal family of Japan. The Yang Dipertua of the department was En. Seth b. Md. Said.

In 1950, more districts came under the jurisdiction of the Town Board and these include Tebrau, Sekudai, Senai, Kulai, Layang-layang, Ulu Tiram, Air Bemban, Ulu Choh, Sedenak, Pengkalan Renting and Pandan. The officials of the Town Board in 1950 not only comprised of the Yang Dipertua and his Secretary but include the Assistant Financial officer, Building Inspector, Town Councillor

6 Health Officers, 2 Town Board Inspectors, 1 Overseer, 3 notice-senders, 5 peons, 1 janitor and 16 clerks.

The general policy adopted by the Town Board revolved around the control and maintenance of public utilities and services and in this respect, has to strive towards achieving financial self-reliance. The department also had other committees such as the Assessment, Building, Licensing, Advertising and Rent Assessment Committees.

As compared to 1949, the revenue collected had increased by 20 %. As for the population size in 1950, there were 42,500 persons[15]. At that time, the Singapore Improvement Trust (SIT) was the only housing agency that was building houses to overcome the problem of housing shortage in Johor Bahru. The number of bicycles registered were 13,239 and trishaws, 300. As for buffalo-carts, there were only 4 or 5 existing.

From 1950 onwards, the department's responsibilities were increased to include the catching and shooting of stray dogs and those without licenses.

From 1855 to 1950, the council had been spending enormous sums on the construction of embankments, repairing canals, drains and dams. Such a practice was primarily due to the problem of frequent flooding particularly in such areas as Segget, Air Molek, Cat river and Tebrau straits.

In 1960, the net revenue amounted to $1,477,437. Alot of the expenditure, however, was used for repairing and increasing street-lightings, retaining walls, for building playgrounds, planting of trees and greenery and the construction of the Diamond Jubilee Hall.

In 1933, the Johor Hotel or the Johor Rest House was renovated and converted to the Town Board and finally to the Municipality of Johor Bahru in 1952.

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15. Source : Registrar of births and deaths.

8.0 HISTORICAL DEVELOPMENT OF SHIPPING HARBOURS AND DOCKYARDS

It was through a dock built at the mouth of Sg. Segget[16] that trading was possible with Singapore and other countries. Goods were transacted and transported by ships, tongkangs and sampans.

In 1909, with the completion of the railway line linking Johor Bahru and Gemas, another dock was built in front of Jalan Wan Jusuh. It was from this dock that people heading for Singapore could take a boat ride across to Woodlands. However, with the completion of the causeway, the dock was no longer in use.

At the third mile in Kampong Dock was a dock called Tambatan Kapal Kerajaan which is still in use today.

Istana Dock, situated in front of the main palace, had a structure mounted on steel pillars and being surrounded by flowers and green shrubs. There was also a building to accomodate workers-in-charge of the boats and ships of the Sultan. Previously, this dock had been the place where ships carrying royal visitors such as the Siamese King, Sultans from other Malay States, Governors and British Officials docked. This dock has also been of historical significance as this is the place where Sultan Ibrahim and Governor Lawrence Guillemard placed the foundation for the construction of the Johor Causeway on April, 24th.1920.

It must be reckoned that without doubt that the docks in Johor Bahru were of considerable importance prior to the construction of the causeway in 1924, the opening of the railway line between Johor Bahru and Gemas and finally, to Singapore and in general, the development of the road network system in Johor Bahru.

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16. Only traces remain today.

Appendix II - 1: FUTURE POPULATION DISTRIBUTION BY MUKIMS IN THE STUDY AREA, 1970-2000 (IN '000)

| DISTRICT | MUKIM | 1970 | | 1980 | | 1990 | | 2000 | |
|---|---|---|---|---|---|---|---|---|---|
| JOHOR BAHRU | MPJB | 150.8 | 275.5 | 247.0 | 417.42 | 398.5 | 654.8 | 520.0 | 1000.0 |
| | Jelutong/Pulai | 19.8 | | 23.7 | | 51.7 | | 94.7 | |
| | Plentong | 22.1 | | 37.7 | | 81.6 | | 235.0 | |
| | Sedenak | 18.1 | | 22.6 | | 24.4 | | 28.9 | |
| | Senai/Kulai | 36.3 | | 52.1 | | 62.0 | | 79.9 | |
| | Sg. Tiram | 8.3 | | 9.1 | | 10.2 | | 11.4 | |
| | Tg Kupang | 4.5 | | 4.7 | | 5.1 | | 5.6 | |
| | Tebrau | 15.6 | | 17.6 | | 21.3 | | 24.5 | |
| KOTA TINGGI | Kota Tinggi | 23.2 | 50.6 | 30.8 | 80.5 | 39.8 | 109.1 | 50.5 | 148.5 |
| | Ulu Sg. Johor | 8.4 | | 10.7 | | 13.4 | | 16.4 | |
| | Primary Area | 307.1 | | 458.9 | | 708.0 | | 1,066.9 | |
| | Johor Lama | 4.3 | | 7.3 | | 12.7 | | 22.4 | |
| | Pantai Timur | 5.1 | | 5.4 | | 6.1 | | 7.1 | |
| | Pengerang | 7.2 | | 6.6 | | 8.4 | | 10.7 | |
| | Sedili Kechil | 0.4 | | 0.5 | | 0.7 | | 0.9 | |
| | Tg. Surat | 2.0 | | 19.2 | | 28.0 | | 40.5 | |
| PONTIAN | Api-Api | 12.3 | 117.8 | 12.3 | 121.7 | 14.7 | 164.7 | 17.7 | 201.9 |
| | Ayer Baloi | 12.0 | | 11.6 | | 13.7 | | 16.1 | |
| | Ayer Masin | 5.2 | | 5.2 | | 5.9 | | 6.7 | |
| | Benut | 16.0 | | 15.7 | | 18.1 | | 21.3 | |
| | Jeram Batu | 13.2 | | 15.4 | | 19.4 | | 25.2 | |
| | Pengkalan Raja Pontian | 16.0 | | 25.5 | | 48.9 | | 62.3 | |
| | Rimba Terjun | 24.9 | | 19.8 | | 23.7 | | 28.2 | |
| | Serkat | 7.6 | | 7.1 | | 9.0 | | 11.0 | |
| | Sg. Karang | 3.0 | | 2.0 | | 2.4 | | 2.8 | |
| | Sg. Pinggan | 7.6 | | 7.1 | | 8.9 | | 10.6 | |
| | Secondary Area | 136.8 | | 160.7 | | 220.6 | | 283.5 | |
| | TOTAL STUDY AREA | 443.9 | | 619.6 | | 928.6 | | 1.350.4 | |

Note: (1) Targets estimated by Unit Pelan Struktur 1981

(2) Population by mukims do not add up to that district due to 2,880 navy personnel from Woodlands, Singapore.

Source: ACTUAL POPULATION
Urban Transport Study Team Estimates 1981. POPULATION SECTION

## APPENDIX II-2 LAND USE PATTERN (1974) - I.F.T. WONG

| | NON-AGRICULTURE (HA.) | | | | | AGRICULTURE (HA.) | | | | | | Total Land Use Area (HA.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | Forest/ Swamp | Mining | Others | Sub-Total | Rubber | Oil Palm | Coconut | Horti/ Mart gards | Others | Sub-Total | |
| J.B. Mukim * | 2,760 | 140 | - | 622 | 3,522 | 203 | - | 37 | - | 11 | 251 | 3,773 |
| Tg. Kupang | 19 | 3,115 | - | 1,324 | 4,458 | 2,736 | - | 521 | 321 | 88 | 3,666 | 8,125 |
| Pulai/Jelutong | 331 | 2,803 | - | 1,745 | 4,879 | 16,438 | 241 | 180 | 135 | 140 | 17,134 | 22,013 |
| Teberau | 724 | 61 | 3 | 2,165 | 2,953 | 11,050 | 5,055 | 276 | 480 | 147 | 17,008 | 19,961 |
| Pelentong | 1,482 | 2,841 | 40 | 4,216 | 8,579 | 14,062 | 1,221 | 677 | 273 | 442 | 16,655 | 25,234 |
| Sg. Tiram | 102 | 6,522 | 19 | 6,730 | 13,383 | 8,916 | 1,421 | 166 | 84 | 293 | 10,880 | 24,263 |
| Senai - Kulai | 1,077 | 7,304 | 28 | 2,230 | 10,729 | 16,236 | 15,431 | - | 189 | 691 | 32,547 | 43,276 |
| Sedenak | 453 | 10,865 | - | 4,913 | 16,231 | 11,371 | 2,079 | 34 | 498 | 1,384 | 15,366 | 31,597 |
| JOHOR BAHRU DISTRICT | 6,948 | 33,661 | 90 | 24,035 | 64,734 | 81,012 | 25,448 | 1,891 | 1980 | 3,176 | 113,507 | 178,242 |
| Benut | 25 | 1,472 | - | 1,260 | 2,757 | 5,171 | 31 | 4,342 | 384 | 1,750 | 11,678 | 14,435 |
| Sg. Pinggan | 45 | 163 | - | 1,643 | 1,851 | 2,834 | 11 | 1,218 | 443 | 817 | 5,323 | 7,173 |
| Ayer Baloi | 5 | 4,217 | - | 2,767 | 6,989 | 4,045 | 17 | 1,625 | 899 | 1,396 | 7,681 | 14,970 |
| Api-Api | 37 | 1,161 | - | 1,126 | 2,324 | 2,697 | 56 | 560 | 734 | 2,433 | 6,480 | 8,804 |
| Pontian | 167 | 717 | - | 2,180 | 3,064 | 4,654 | 78 | 329 | 982 | 3,664 | 9,707 | 12,771 |
| Pengkalan Raja | - | 64 | 26 | 145 | 235 | 460 | - | - | 55 | 354 | 869 | 1,104 |
| Rimba Terjun | 106 | 212 | - | 900 | 1,218 | 3,578 | 261 | 1,406 | 588 | 2,271 | 8,103 | 9,322 |
| Sg. Karang | - | 3,278 | - | 831 | 4,109 | 1,385 | - | 426 | 44 | 594 | 2,449 | 6,558 |
| Ayer Masin | 25 | 313 | - | 425 | 763 | 1,406 | 33 | 756 | 118 | 641 | 2,954 | 3,717 |
| Jeram Batu | 237 | 2,572 | 44 | 1,258 | 4,111 | 4,978 | 85 | 655 | 157 | 1,280 | 7,155 | 11,266 |
| Serkat | 19 | 2,121 | - | 478 | 2,618 | 1,378 | - | 1,606 | 198 | 247 | 3,456 | 6,074 |
| Pulau Kukup | - | 634 | - | 247 | 908 | - | - | - | - | - | - | 908 |
| PONTIAN DISTRICT | 666 | 16,924 | 70 | 13,287 | 30,946 | 32,586 | 572 | 12,923 | 4,602 | 15,474 | 66,155 | 97,101 |
| Kota Tinggi | 462 | 11,586 | 656 | 1,975 | 14,679 | 14,402 | 7,248 | 38 | 284 | 2,430 | 24,402 | 39,081 |
| Part of Ulu Sg. Johor | 30 | 20,499 | 594 | 3,490 | 24,613 | 650 | 3,430 | 30 | 144 | 2,226 | 6,480 | 31,093 |
| Sedeli Kechil | - | 20,865 | 7 | 10,240 | 31,112 | 154 | 627 | 25 | 53 | - | 859 | 31,971 |
| Johor Lama | 186 | 2,549 | 32 | 4,112 | 6,879 | 4,379 | 6,320 | 50 | 33 | 8 | 12,789 | 19,668 |
| Tg. Surat | 304 | 7,766 | 19 | 12,962 | 21,051 | 3,210 | 7,722 | 60 | 42 | 4 | 11,038 | 32,089 |
| Pantai Timor | 28 | 11,827 | 835 | 10,046 | 22,736 | 15 | - | 364 | 163 | - | 541 | 23,277 |
| Penggerang | 47 | 5,681 | 231 | 6,862 | 12,821 | 1,532 | 2,721 | 1,016 | 108 | 40 | 5,416 | 18,237 |
| PORT OF KOTA TINGGI DISTRICT | 1,057 | 80,773 | 2,374 | 49,687 | 133,891 | 24,342 | 30,068 | 1,583 | 827 | 4,708 | 61,525 | 195,416 |
| STUDY AREA | 8,671 | 131,358 | 2,534 | 87,009 | 229,572 | 137,940 | 56,088 | 16,397 | 7,409 | 23,358 | 241,192 | 470,759 |

* Prior to 1976, the MPJB area includes the Mukim of Johor Bahru together with part of the Mukims of Teberau, Pulai - Jelutong and Pelentong.

Sources: 1. I.F.T. Wong, Present Land Use of Peninsular Malaysia (1974 & 1966)
2. Resource Maps (1979)
3. Department of Land and Mines (1981)

Appendix II - 3 : FUTURE GROSS POPULATION DENSITY BY MUKIMS IN THE STUDY AREA, 1970-2000.

(persons/hectare)

| DISTRICT | MUKIM | 1970 | | 1980 | | 1990 | | 2000 | |
|---|---|---|---|---|---|---|---|---|---|
| JOHOR BAHRU | MPJB | 12.63 | 1.55 | 20.69 | 2.34 | 33.42 | 3.67 | 43.55 | 5.61 |
| | JELUTONG/PULAI | 0.93 | | 1.12 | | 2.44 | | 4.42 | |
| | PELENTONG | 1.09 | | 1.86 | | 4.02 | | 11.59 | |
| | SEDENAK | 0.57 | | 0.72 | | 0.77 | | 0.91 | |
| | SENAI/KULAI | 0.84 | | 1.20 | | 1.43 | | 1.85 | |
| | SG.TIRAM | 0.34 | | 0.38 | | 0.42 | | 0.47 | |
| | TG. KUPANG | 0.55 | | 0.58 | | 0.63 | | 0.68 | |
| | TEBRAU | 0.89 | | 1.00 | | 1.21 | | 1.38 | |
| KOTA TINGGI | KOTA TINGGI | 0.59 | 0.26 | 0.79 | 0.41 | 1.02 | 0.56 | 1.29 | 0.76 |
| | ULU SG. JOHOR | 0.27 | | 0.34 | | 0.43 | | 0.53 | |
| | PRIMARY AREA | 1.24 | | 1.85 | | 2.85 | | 4.29 | |
| | JOHOR LAMA | 0.22 | | 0.37 | | 0.65 | | 1.14 | |
| | PANTAI TIMUR | 0.22 | | 0.23 | | 0.26 | | 0.31 | |
| | PENGERANG | 0.39 | | 0.36 | | 0.46 | | 0.59 | |
| | SEDELI KECHIL | 0.01 | | 0.02 | | 0.02 | | 0.03 | |
| | TG. SURAT | 0.06 | | 0.60 | | 0.87 | | 1.26 | |
| PONTIAN | API API | 1.40 | 1.21 | 1.40 | 1.25 | 1.67 | 1.70 | 2.01 | 2.08 |
| | AYER BALOI | 0.80 | | 0.77 | | 0.92 | | 1.08 | |
| | AYER MASIN | 1.40 | | 1.40 | | 1.59 | | 1.80 | |
| | BENUT | 1.11 | | 1.09 | | 1.25 | | 1.48 | |
| | JERAM BATU/P. RAJA | 1.17 | | 1.37 | | 1.72 | | 2.24 | |
| | PONTIAN | 1.25 | | 2.00 | | 3.83 | | 4.88 | |
| | RIMBA TERJUN | 2.67 | | 2.12 | | 2.54 | | 3.03 | |
| | SERKAT | 1.25 | | 1.17 | | 1.48 | | 1.81 | |
| | SG. KARANG | 0.46 | | 0.31 | | 0.37 | | 0.43 | |
| | SG. PINGGAN | 1.06 | | 0.99 | | 1.24 | | 1.48 | |
| | SECONDARY AREA | 0.62 | | 0.73 | | 1.00 | | 1.28 | |
| | TOTAL STUDY AREA | 0.94 | | 1.32 | | 1.97 | | 2.87 | |

APPENDIX II-4 : Housing Schemes Development within MPJB (As at 1981)

| HOUSING PROJECTS | AREA (HA.) | HOUSING UNITS | SHOPHOUSES |
|---|---|---|---|
| UNDER CONSTRUCTION | | | |
| 1. Taman Permas Jaya | 511 | 11,440 | 1,266 |
| 2. SEDC Scheme | 394 | 5,892 | 306 |
| 3. UDA - Phase 1 | 30 | 871 | 94 |
| - Phase 2 | 85 | 2,855 | 48 |
| - Phase 3 | 10 | - | 266 |
| 4. Taman Sentosa | 102 | 1,827 | 442 |
| SUB-TOTAL | 1,132 | 22,885 | 2,422 |
| APPROVED FOR CONSTRUCTION | | | |
| 1. Taman Intan | 113 | 2,964 | 701 |
| 2. Taman Tai Hong | 178 | 2,297 | 900 |
| SUB-TOTAL | 291 | 5,261 | 1,601 |
| UNDER CONSIDERATION | | | |
| 1. Perumahan KKTK Tempatan* | 67 | 1,212 | 137 |
| 2. Taman Saujana* | 64 | 763 | 60 |
| 3. Taman Desa Indah* | 80 | 2,131 | 158 |
| 4. Taman Dr. Sambathan | 21 | 844 | 19 |
| 5. Sykt. Hamidi Sdn. Bhd. | 36 | 940 | 53 |
| 6. Cahaya Terang Realty Sdn. Bhd. | 13 | 385 | 55 |
| SUB-TOTAL | 281 | 6,275 | 482 |
| TOTAL | 1,704 | 34,421 | 4,505 |

Source: Johor Town & Country Planning Department (1981)
* Housing schemes already approved by Johor Town & Country Planning Department (1981)

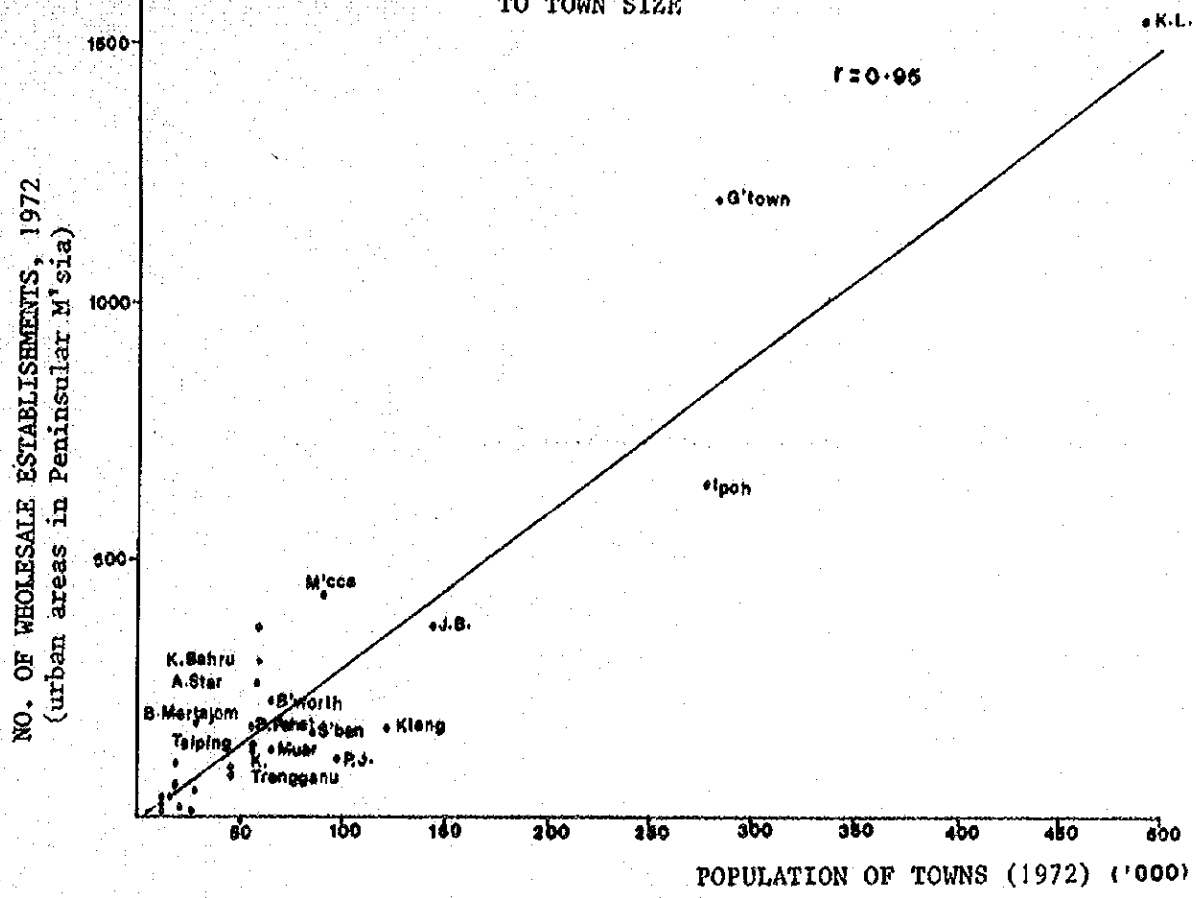
APPENDIX II-5 : Housing Schemes Development Outside MPJB (at at 1981)

| HOUSING PROJECTS | AREA (HA.) | HOUSING UNITS | SHOPHOUSE |
|---|---|---|---|
| UNDER CONSTRUCTION | | | |
| 1. Taman Sri Skudai | 90 | 2,829 | 468 |
| 2. Taman Tun Aminah | 987 | 11,502 | 1,914 |
| 3. Pasir Gudang New Town | 380 | 37,300 | n.a. |
| 4. Taman Dawani | 30 | 276 | 42 |
| 5. Taman Aman | 85 | 338 | 124 |
| 6. Taman Pelentong Baru | 96 | 800 | 297 |
| 7. Taman Kota Putri | 649 | 15,164 | 989 |
| SUB-TOTAL | 2,317 | 68,209 | - |
| UNDER CONSIDERATION | | | |
| 1. Gunung Hijau* | 352 | 5,666 | 724 |
| 2. Gabungan Putra* | 186 | 4,761 | 503 |
| 3. Yondaz Green Sdn. Bhd.* | 313 | 7,390 | 871 |
| 4. Kemajuan Besi Jaya Sdn. Bhd.* | 81 | 2,047 | 252 |
| 5. Sim Hup Sdn. Bhd. & Trade Credit* | 58 | 1,445 | 671 |
| 6. Mukim Pulai* | 80 | 3,500 | - |
| 7. Eastern Realty* | 63 | 1,549 | 158 |
| 8. Daiman* | 40 | 9,033 | 1,747 |
| 9. Taman Rimzab* | 128 | 3,049 | 333 |
| 10. Teamco Sdn. Bhd.* | 270 | 6,591 | 564 |
| 11. Realty Sdn. Bhd.* | 66 | 8,876 | 1,633 |
| 12. Saujana Jaya Sdn. Bhd. | 122 | 4,613 | 383 |
| 13. Taman Sri Timur* | 63 | 1,543 | 153 |
| 14. Taman Sri Alam | 1,269 | 8,813 | - |
| 15. Eastern Enterprise | 178 | 5,574 | 748 |
| 16. Purling Estate | 324 | 10,000 | - |
| 17. Keck Seng Estate | 280 | 9,000 | - |
| SUB-TOTAL | 3,873 | 93,450 | - |
| TOTAL | 6,190 | 161,659 | - |

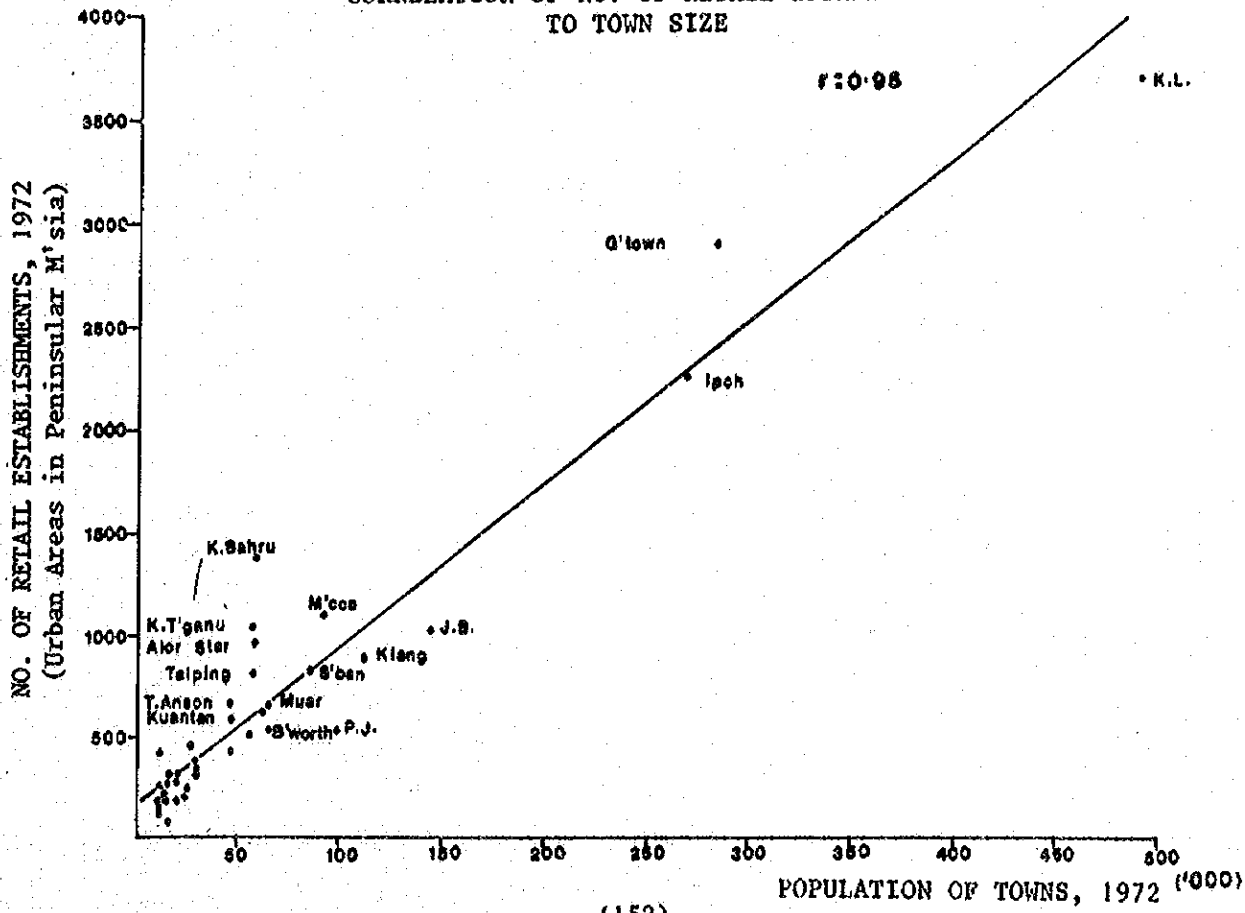
Source: Johor Town & Country Planning Department (1981)

* Schemes already approved by Town & Country Planning Department

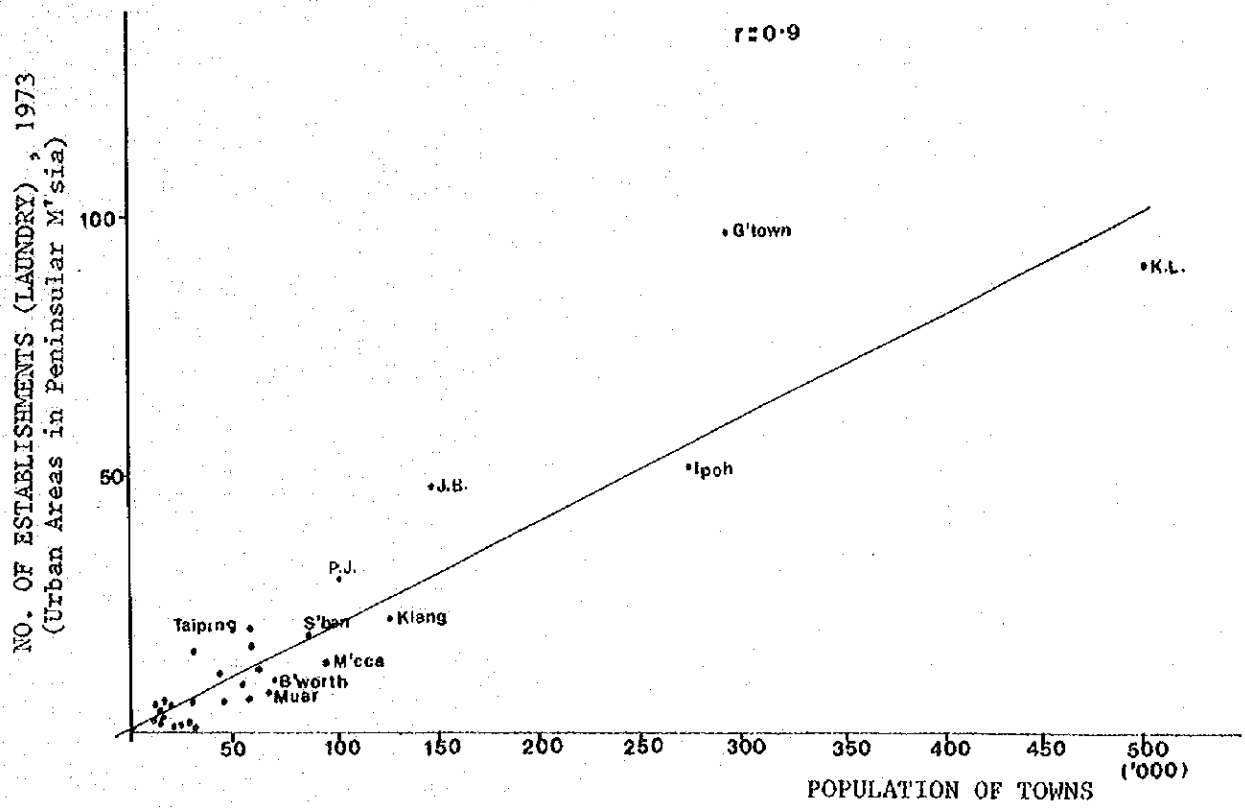
APPENDIX II-6 CORRELATION OF NO. OF WHOLESALE ESTABLISHMENTS TO TOWN SIZE



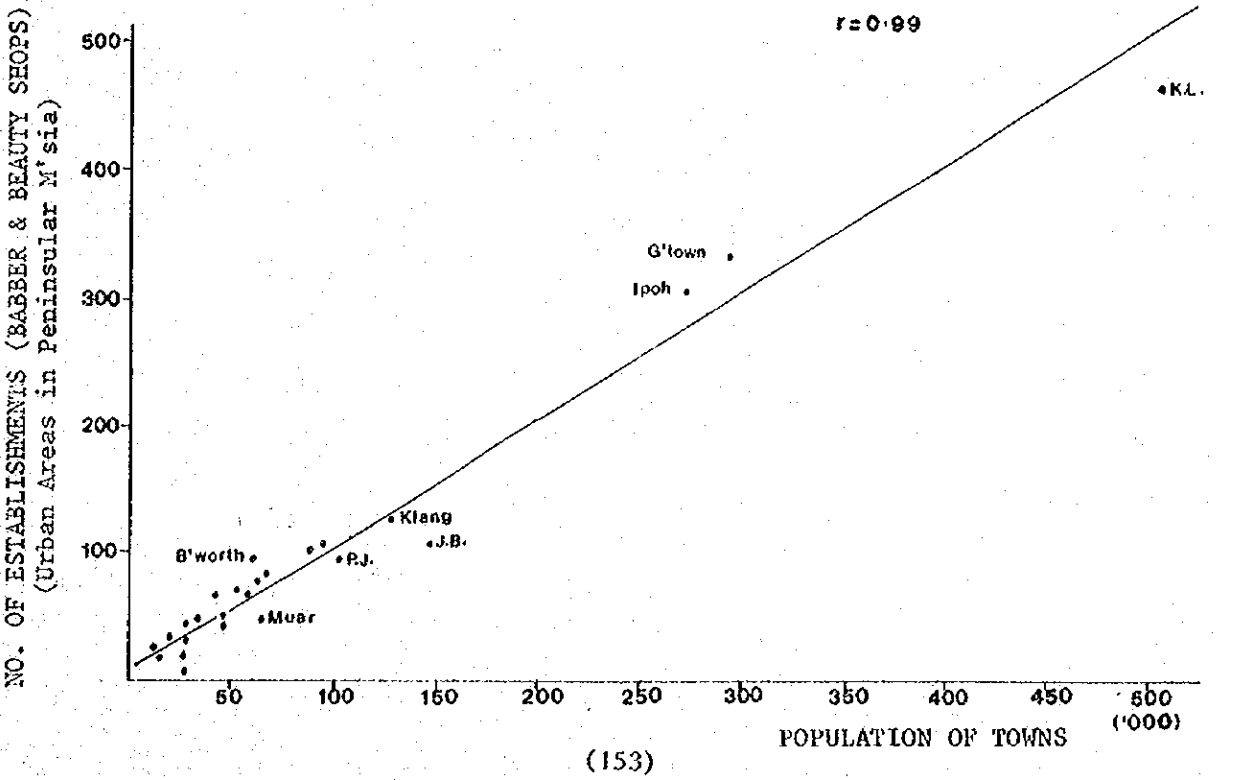

APPENDIX II-7 CORRELATION OF NO. OF RETAIL ESTABLISHMENTS TO TOWN SIZE



APPENDIX II-8 CORRELATION OF NO. OF LAUNDRY ESTABLISHMENTS TO TOWN SIZE

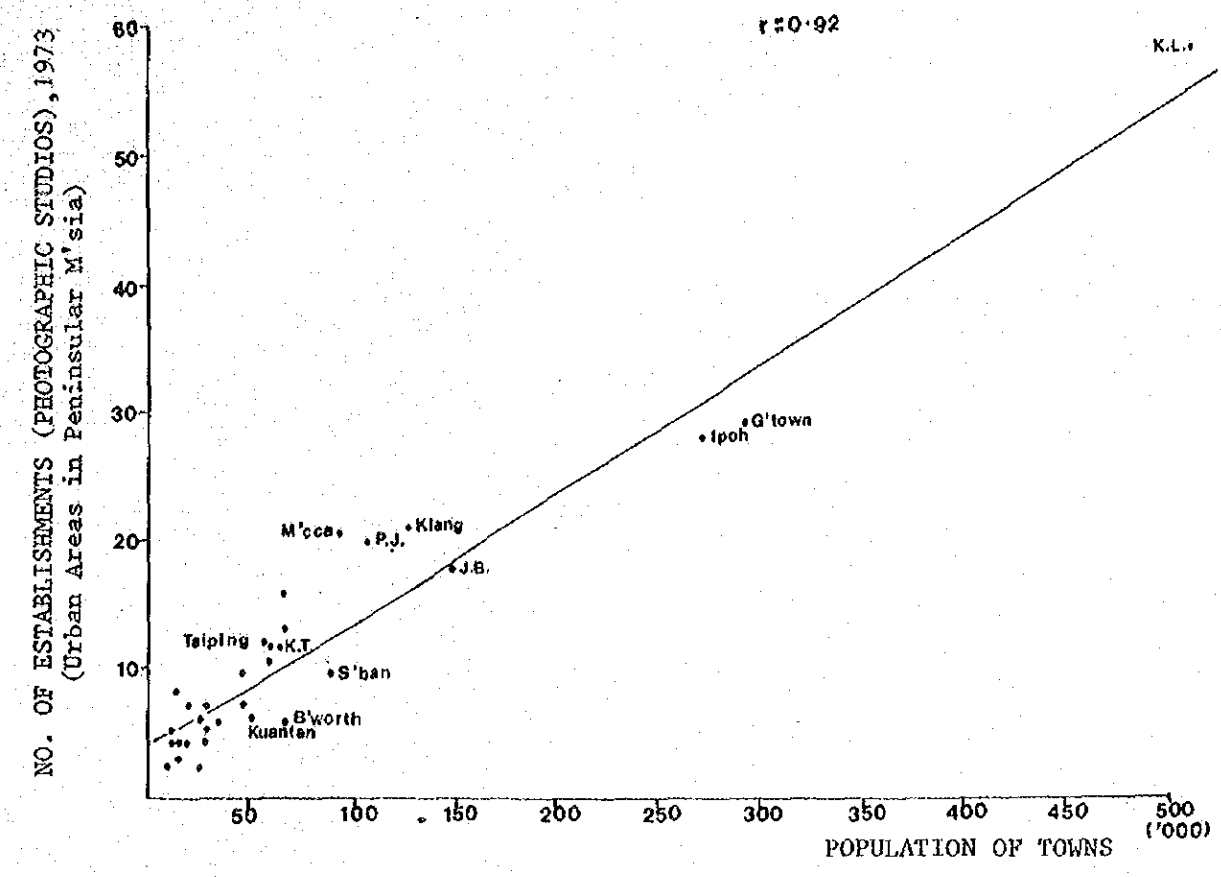



APPENDIX II-9 CORRELATION OF NO. OF BABBER AND BEAUTY SHOPS TO TOWN SIZE



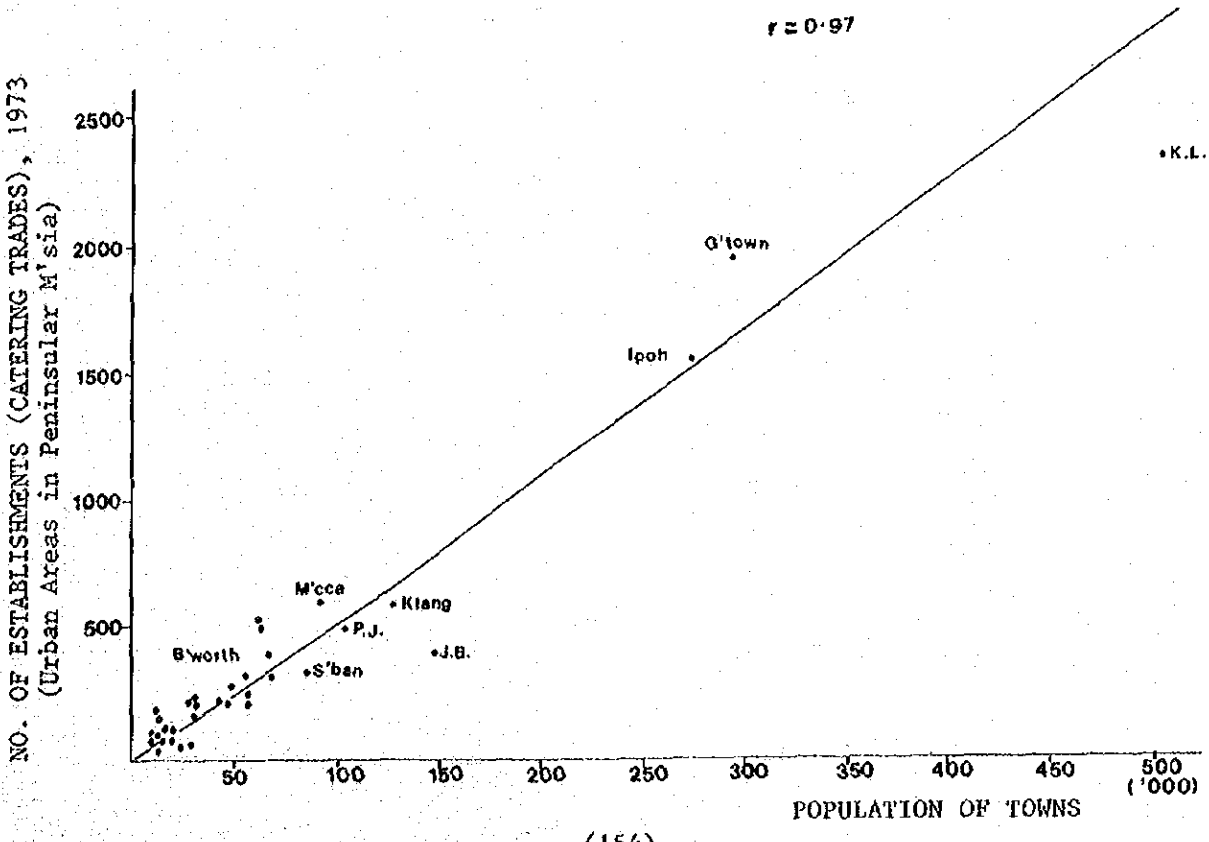
APPENDIX II-10

CORRELATION OF NO. OF PHOTOGRAPHIC STUDIOS TO TOWN SIZE



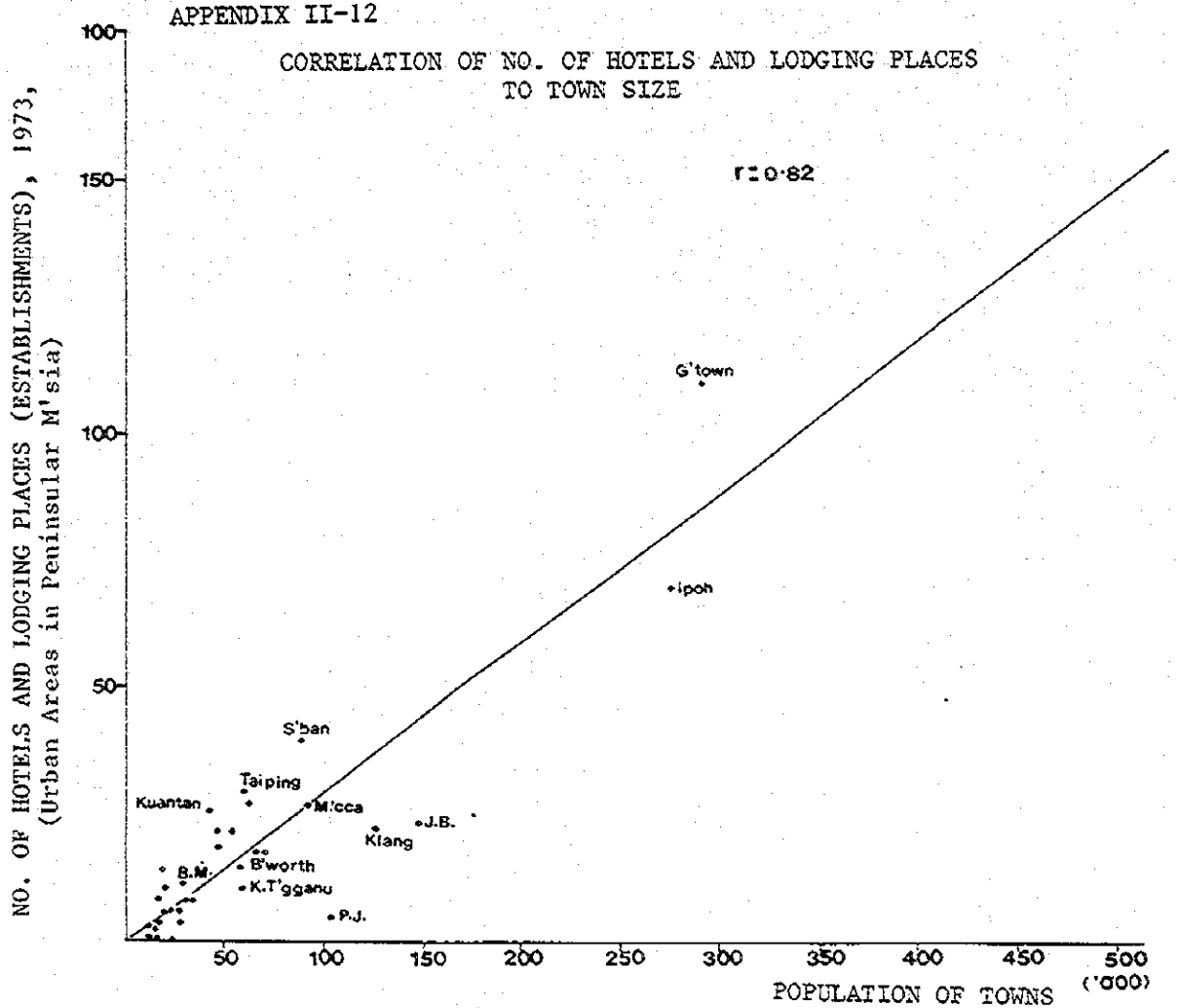

CORRELATION OF NO. OF CATERING TRADES ESTABLISHMENTS TO TOWN SIZE

APPENDIX II-11

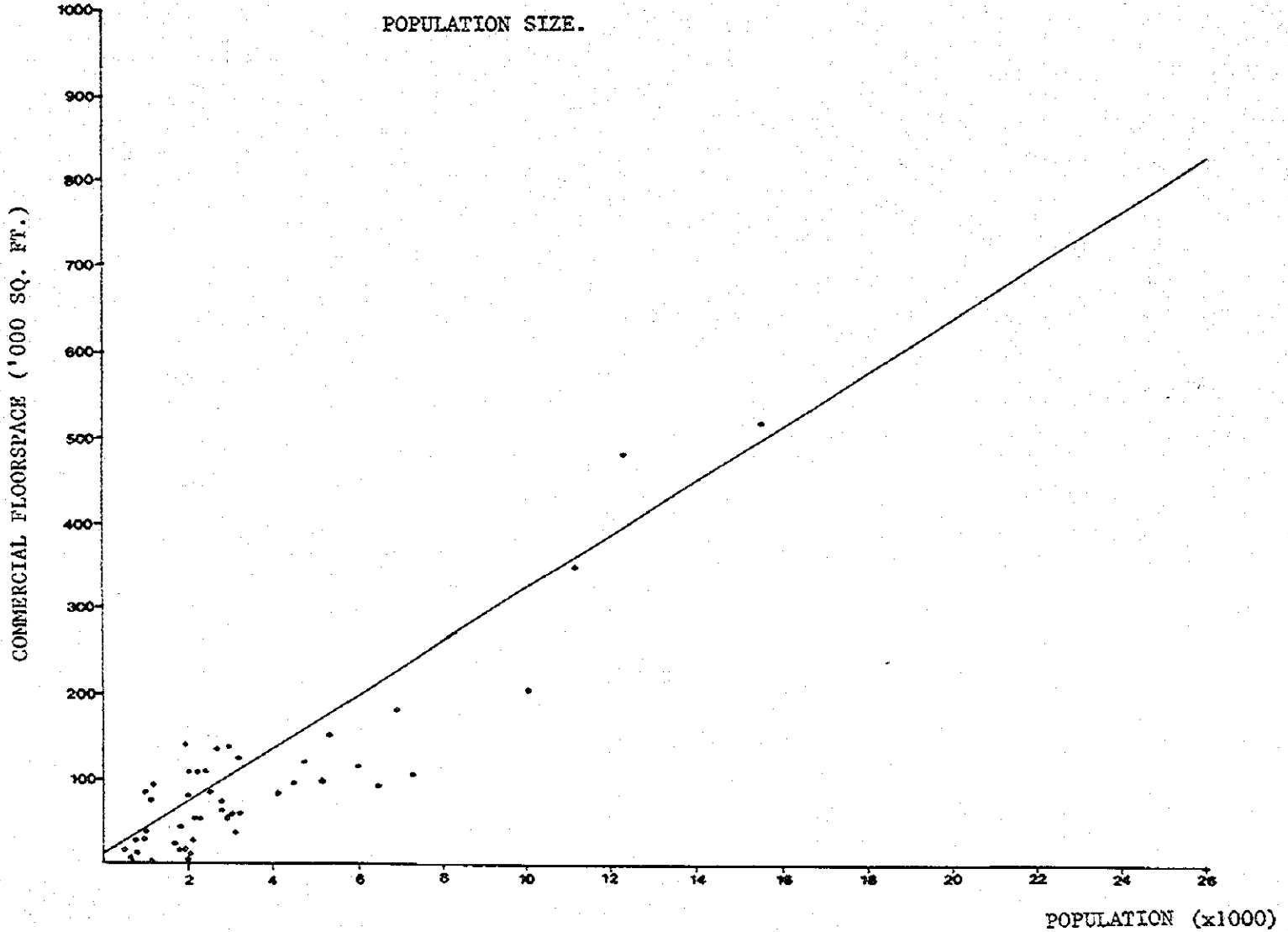


APPENDIX II-12

CORRELATION OF NO. OF HOTELS AND LODGING PLACES TO TOWN SIZE



APPENDIX II-13 CORRELATION OF COMMERCIAL FLOOR SPACE AND POPULATION SIZE.



## APPENDIX II-14 Distribution of Rubber - Cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES (Felda,Felcra,Risda,Kejora, SEDC, State, R.O.A.) | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 30575 | 29881 | 29205 | 28659 | 1289 | 1106 | 1054 | 1017 | - | - | - | - | 31863 | 30988 | 30260 | 29677 |
| Johor Bahru | 28195 | 27870 | 24389 | 23949 | 40383 | 39396 | 38760 | 38442 | 7300 | 7553 | 7423 | 6664 | 75878 | 74818 | 70573 | 69054 |
| Kota Tinggi | 8272 | 8275 | 8761 | 8524 | 27755 | 27633 | 27633 | 27593 | 11001 | 10353 | 16281 | 16190 | 47432 | 46262 | 52675 | 52307 |
| Johor State | 292601 | 291108 | 293513 | 294889 | 182363 | 176342 | 175183 | 17601 | 42386 | 42002 | 47440 | 46863 | 517350 | 509452 | 516136 | 517548 |

Source: Jabatan Pertanian Negeri Johor, Laporan Tahunan (1977, 78, 79, 80)

## APPENDIX II-15 Distribution of Palm-Oil cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 674 | 1230 | 1671 | 2434 | 546 | 776 | 736 | 833 | - | - | - | - | 1220 | 2006 | 2467 | 3267 |
| Johor Bahru | 8128 | 704 | 372 | 1056 | 20544 | 29438 | 29438 | 29606 | 8634 | 8460 | 9384 | 9662 | 37306 | 38602 | 39794 | 40324 |
| Kota Tinggi | 1217 | 1501 | 1510 | 1682 | 6895 | 7471 | 8234 | 8234 | 50281 | 58214 | 82295 | 86412 | 58447 | 67186 | 92038 | 96327 |
| Johor State | 18981 | 14508 | 16730 | 18826 | 101740 | 115164 | 123973 | 124458 | 79929 | 89769 | 122107 | 128278 | 200650 | 219441 | 262810 | 271562 |

Source: Jabatan Pertanian Negeri Johor, Laporan Tahunan (1977, 78, 79, 80)

## APPENDIX II-16 Distribution of Coconut - Cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 16575 | 16651 | 16800 | 16803 | - | 11 | 11 | 11 | 41 | 41 | 41 | 41 | 16616 | 16703 | 16856 | 16856 |
| Johor Bahru | 638 | 597 | 756 | 765 | 67 | 64 | 64 | 64 | 41 | 41 | 41 | 41 | 746 | 703 | 859 | 870 |
| Kota Tinggi | 1745 | 1744 | 1736 | 1738 | - | - | - | - | 2 | 2 | 2 | 2 | 1747 | 1746 | 1738 | 1740 |
| Johor State | 66420 | 66704 | 67268 | 67790 | 125 | 126 | 126 | 85 | 130 | 131 | 131 | 131 | 66736 | 66960 | 67524 | 68006 |

Source: Jabatan Pertanian Negeri Johor, Laporan Tahunan (1977, 78, 79, 80)

## APPENDIX II-20 Distribution Of Orchards (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 770 | 1001 | 1085 | 847 | | | | | 8 | 8 | 8 | 286 | 778 | 1008 | 1093 | 1134 |
| Johor Bahru | 498 | 608 | 685 | 699 | | | | | - | - | - | 12 | 498 | 608 | 685 | 711 |
| Kota Tinggi | 26 | 374 | 462 | 776 | | | | | 499 | 446 | 529 | 258 | 526 | 820 | 991 | 1034 |
| Johor State | 7369 | 7877 | 8885 | 9291 | | | | | 569 | 522 | 576 | 669 | 7938 | 8460 | 9461 | 9960 |

Source: Jabatan Pertanian Negeri Johor, Lapuran Tahunan (1977, 78, 79, 80)

## APPENDIX II-21 Distribution of Horticulture & Market-gardening (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 208 | 336 | 384 | 165 | | | | | | | | | 208 | 336 | 384 | 165 |
| Johor Bahru | 488 | 571 | 482 | 146 | | | | | | | | | 488 | 571 | 481 | 146 |
| Kota Tinggi | 1250 | 174 | 196 | 150 | | | | | | | | | 1250 | 174 | 196 | 150 |
| Johor State | 6744 | 5981 | 5079 | 4018 | | | | | | | | | 6744 | 5981 | 5079 | 4018 |

Source: Jabatan Pertanian Negeri Johor, Lapuran Tahunan (1977, 78, 79, 80)

## APPENDIX II-17 Distribution of Coffee - Cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 794 | 856 | 906 | 1222 | | | | | | | | | 794 | 856 | 906 | 1223 |
| Johor Bahru | 15 | 50 | 119 | 145 | | | — | | | | — | | 15 | 50 | 119 | 145 |
| Kota Tinggi | 32 | 32 | 45 | 45 | | | | | | | | | 32 | 32 | 45 | 45 |
| Johor State | 2948 | 4242 | 4740 | 5560 | | | — | | | | — | | 2948 | 4242 | 4740 | 5560 |

Source: Jabatan Pertanian Negeri Johor, Lapuran Tahunan (1977, 78, 79, 80)

## APPENDIX II-18 Distribution of Pineapple - Cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 3620 | 42482 | 4105 | 2876 | 4362 | 4362 | 3426 | 3426 | | | | | 7982 | 8643 | 7531 | 6302 |
| Johor Bahru | 159 | 155 | 106 | 121 | - | - | - | - | | | — | | 159 | 155 | 106 | 121 |
| Kota Tinggi | 2 | 8 | 10 | 11 | - | - | - | - | | | | | 2 | 10 | 10 | 11 |
| Johor State | 8828 | 10044 | 9814 | 9520 | 10671 | 10671 | 9776 | 6582 | | | — | | 19500 | 20715 | 1955 | 16103 |

Source: Jabatan Pertanian Negeri Johor, Lapuran Tahunan (1977, 78, 79, 80)

## APPENDIX II-19 Distribution of Cocoa - Cultivated Land (ha.)

| | SMALLHOLDING | | | | ESTATES | | | | GOVT. AGENCIES | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 | 77 | 78 | 79 | 80 |
| Pontian | 185 | 482 | 904 | 1559 | - | - | - | - | - | - | - | - | 185 | 482 | 904 | 1559 |
| Johor Bahru | - | 195 | 385 | 386 | - | - | - | - | - | 497 | 952 | 952 | - | 693 | 1337 | 1338 |
| Kota Tinggi | - | 47 | 96 | 110 | 81 | 81 | 81 | 81 | - | - | - | - | 81 | 128 | 175 | 191 |
| Johor State | 2260 | 2989 | 4692 | 6397 | 1625 | 1878 | 1938 | 1981 | - | 1307 | 1526 | 2378 | 3885 | 6174 | 8157 | 10755 |

Source: Jabatan Pertanian Negeri Johor, Lapuran Tahunan (1977, 78, 79, 80)

APPENDIX II-22

Developments affecting existing cropped area

| Urban Developments | 1990 (Ha.) | 2000 (Ha.) |
|---|---|---|
| HOUSING | | |
| . Approved | 291 | |
| . Approved only by Town and Country Planning Department. | | 3,620 |
| INSTITUTIONAL | | |
| . UTM Campus | 809 | |
| . Port and other public devt. at Pasir Gudang | 786 | |
| . Toll expressway -250 m wide - 40 m long | | 1,000 |
| . Access road to Johor Port - 60 m wide 7 km long | 42 | |
| . Railway to Pasir Gudang | 1,667 | |
| INDUSTRY | | |
| . Pasir Gudang Industrial Estate | 928 | |
| . Senai Free Trade Zone | 40 | |
| . Bandar Renawar Industrial Estate | 26 | |
| . Estimated future industrial land requirements | 994 | 720 |
| TOTAL | 2,952 | 5,340 |

APPENDIX III FIELD COUNT SURVEY ON POPULATION; 1980
HOUSEHOLD SURVEY.

## CODE OF TYPE OF RESIDENT

| Private Housing Unit | CODE |
|---|---|
| House : | |
| Bungalow | 1 |
| Semi-Detached | 2 |
| Terrace | 3 |
| Long House | 4 |
| Flats/Apartment : | |
| Housing Block | 5 |
| Shop Houses, Office | 6 |
| Others | 7 |
| Room : | |
| Shop Houses, Office | 6 |
| In/Attached to the House | 9 |
| In/Attached to the Factory, Lodge,etc. | 10 |
| Others | 11 |
| Others : | |
| Temporary shelter | 12 |
| Others; Caves. | 13 |
| **Marginal Housing Units** | |
| Permanent Building; | |
| Office, school, Shop, Mosque,etc. | 14 |
| Space of Resident; | |
| House Compound, Open Verandah | 15 |
| Nature Protection Places | 16 |
| Moving Unit | 17 |
| **Collective Living Quarters** | |
| Hotel, Motel, Rest House,etc. | 18 |
| Medical Institution; Hospital,etc. | 19 |
| Educational Institution | 20 |
| Religion and Social Institution | 21 |
| Prison, Detention center,etc. | 22 |
| Temporary Labour Tent. | 23 |
| Others | 24 |

TABLE : TOTAL NUMBER OF RESIDENCES ACCORDING TO TYPE OF RESIDENCE AND ZONE

| ZONE NO. \ HOUSEHOLD SIZE. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9+ | GRAND TOTAL | Total Household |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | 9 | 132 | 10 | 12 | 11 | 8 | 7 | 2 | - | - | 191 | 328 |
| 112 | 1 | 60 | 15 | 5 | 1 | 2 | - | - | - | - | 84 | 119 |
| 113 | 120 | 408 | 24 | 10 | 3 | 2 | 2 | - | 1 | 1 | 571 | 587 |
| 114 | 171 | 344 | 11 | 10 | 4 | 1 | - | - | - | 3 | 544 | 484 |
| 121 | 81 | 674 | 22 | 14 | 5 | 2 | 4 | - | - | - | 802 | 820 |
| 122 | 16 | 428 | 33 | 9 | 5 | 7 | 1 | - | 1 | - | 500 | 589 |
| 123 | 132 | 187 | 8 | 3 | 2 | - | 1 | 1 | - | - | 334 | 232 |
| 211 | 7 | 93 | 5 | - | - | - | - | - | - | - | 105 | 103 |
| 212 | 7 | 255 | 3 | 2 | - | - | - | - | - | - | 267 | 267 |
| 213 | 8 | 233 | 8 | - | - | - | - | - | - | - | 249 | 250 |
| 221 | 11 | 535 | 49 | 13 | 9 | 2 | 2 | - | - | - | 621 | 726 |
| 222 | 42 | 634 | 19 | 13 | 4 | 1 | 1 | 1 | - | - | 715 | 747 |
| 223 | 9 | 238 | 5 | 1 | 3 | 1 | - | - | - | - | 257 | 267 |
| 224 | 1 | 84 | 8 | - | 1 | - | - | - | - | - | 94 | 103 |
| 225 | 4 | 148 | 16 | 40 | 25 | 10 | 4 | 2 | - | 2 | 251 | 502 |
| 231 | 43 | 564 | 9 | 3 | 1 | 3 | 1 | 1 | - | - | 625 | 618 |
| 232 | 232 | 634 | 38 | 9 | 4 | - | 3 | 1 | - | - | 921 | 777 |
| 241 | 92 | 810 | 50 | 24 | 28 | 12 | 15 | 16 | 11 | 23 | 1,081 | 1718 |
| 242 | 264 | 1,822 | 116 | 34 | 18 | 6 | 2 | 1 | 1 | - | 2,264 | 2319 |
| 243 | 143 | 1,056 | 37 | 14 | 5 | 1 | - | 1 | - | 2 | 1,259 | 1222 |
| 251 | 78 | 1,726 | 74 | 28 | 17 | 11 | 2 | 3 | 2 | 1 | 1,942 | 2151 |
| 252 | 94 | 883 | 47 | 25 | 11 | 4 | 6 | - | - | - | 1,070 | 1161 |
| 261 | 60 | 641 | 67 | 16 | 10 | 6 | 2 | 2 | 1 | 1 | 806 | 949 |
| 262 | 209 | 1,379 | 149 | 71 | 40 | 7 | 10 | 3 | 4 | 5 | 1,877 | 2329 |
| 263 | 198 | 701 | 21 | 11 | 8 | 3 | 1 | 1 | - | - | 944 | 834 |
| 264 | 666 | 251 | 28 | 4 | 2 | 2 | 3 | - | 1 | - | 957 | 369 |
| 265 | 39 | 335 | 29 | 4 | 4 | 2 | 5 | - | 3 | 2 | 423 | 506 |
| 271 | 42 | 392 | 22 | 24 | 5 | 1 | 1 | 1 | 1 | - | 489 | 553 |
| 272 | 67 | 643 | 28 | 35 | 51 | 46 | 43 | 26 | 24 | 36 | 999 | 2236 |
| 281 | 56 | 911 | 56 | 24 | 16 | 3 | 1 | - | 1 | 2 | 1,070 | 1219 |
| 311 | 856 | 1,295 | 41 | 2 | 4 | - | - | - | - | 2 | 2,200 | 1423 |
| 312 | 1 | 82 | - | - | - | - | - | - | - | - | 83 | 82 |
| 313 | 17 | 431 | 3 | 3 | 2 | 4 | - | - | - | - | 460 | 475 |
| 314 | 49 | 1,517 | 40 | 7 | 4 | 1 | 1 | 1 | - | - | 1,620 | 1650 |
| 315 | 53 | 1,525 | 71 | 13 | 5 | 1 | 2 | - | - | - | 1,670 | 1739 |
| 321 | 46 | 1,647 | 95 | 47 | 9 | 7 | 3 | - | - | 1 | 1,855 | 2067 |
| 322 | 184 | 2,364 | 49 | 4 | 4 | - | - | - | - | - | 2,605 | 2484 |
| 323 | 79 | 999 | 18 | 8 | 4 | - | - | - | - | 1 | 1,109 | 1087 |
| 324 | 46 | 365 | 7 | 7 | 11 | 1 | 6 | 4 | 3 | - | 450 | 540 |
| 325 | 92 | 661 | 6 | 2 | 1 | - | - | - | - | - | 762 | 678 |
| 331 | 61 | 730 | 53 | 21 | 8 | 3 | - | 1 | - | - | 877 | 956 |
| 332 | 82 | 3,208 | 62 | 22 | 9 | - | 2 | - | - | - | 3,385 | 3449 |
| 333 | 56 | 1,107 | 23 | 21 | 28 | 34 | 16 | 23 | 10 | 8 | 1,326 | 1913 |
| 341 | 150 | 1,776 | 32 | 12 | 3 | 1 | 1 | 1 | - | 2 | 1,978 | 1921 |
| 342 | 98 | 1,593 | 46 | 16 | 10 | 1 | 1 | 1 | - | - | 1,766 | 1790 |
| 351 | 185 | 2,260 | 44 | 15 | 3 | 3 | 4 | 1 | 1 | 1 | 2,517 | 2475 |
| 352 | 47 | 597 | 7 | - | - | - | - | - | - | - | 651 | 613 |
| 353 | 59 | 160 | 6 | 1 | - | - | - | - | - | - | 226 | 176 |
| 361 | 67 | 130 | 1 | - | - | - | - | - | - | - | 198 | 187 |
| 411 | 361 | 884 | 6 | - | - | - | 1 | - | - | - | 1,252 | 901 |
| 412 | 199 | 465 | - | 1 | - | - | - | - | - | - | 666 | 473 |
| 413 | 118 | 1,038 | 25 | 7 | 5 | 2 | - | - | - | - | 1,195 | 1136 |
| 414 | 162 | 2,208 | 98 | 16 | 6 | 1 | 1 | 1 | - | - | 2,493 | 2813 |
| 421 | 260 | 1,817 | 100 | 26 | 13 | 5 | 9 | 5 | 2 | 8 | 2,245 | 2366 |
| 422 | 578 | 4,302 | 172 | 38 | 16 | 8 | 4 | - | 2 | - | 5,120 | 5027 |
| 423 | 119 | 1,402 | 7 | 5 | 4 | 3 | 5 | 3 | 1 | 3 | 1,552 | 1608 |
| 424 | 109 | 732 | 2 | - | 1 | 1 | - | - | - | 1 | 846 | 758 |
| 431 | 408 | 2,625 | 95 | 20 | 3 | 1 | - | - | - | - | 3,152 | 2897 |
| 432 | 44 | 717 | 2 | - | - | - | - | - | - | - | 763 | 717 |
| 441 | 90 | 495 | 2 | - | - | - | - | - | - | - | 587 | 500 |
| 442 | 59 | 211 | 1 | 2 | - | - | - | - | - | - | 273 | 351 |

MPJB

| NO. OF HOUSEHOLDS / ZONE NO. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9+ | GRAND TOTAL | Total Households |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 443 | 187 | 909 | 4 | - | - | - | 1 | - | - | - | 1,101 | 921 |
| 444 | 438 | 1,485 | 8 | 2 | - | - | - | - | - | - | 1,933 | 1505 |
| 361-4 | 194 | 1,282 | 82 | 35 | 11 | 6 | 4 | 5 | 2 | 7 | 1,628 | 1841 |
| 362 | 27 | 363 | 9 | 4 | 1 | - | 1 | - | - | - | 405 | 400 |
| 363 | - | - | - | - | - | - | - | - | - | - | - | - |
| 364 | 265 | 1,833 | 37 | 4 | 2 | 1 | 1 | - | - | - | 2,143 | 1931 |
| 371 | 106 | 522 | 21 | 3 | 1 | - | - | - | - | - | 653 | 577 |
| 372 | 209 | 1,512 | 66 | 23 | 8 | 3 | - | - | - | 1 | 1,822 | 1768 |
| 373 | 11 | 369 | 1 | 1 | 1 | - | - | - | - | - | 383 | 378 |
| 374 | 42 | 641 | 56 | 5 | - | - | - | - | - | - | 744 | 768 |
| 461 | 295 | 1,001 | 18 | 1 | - | - | - | - | - | - | 1,315 | 1803 |
| 462 | 186 | 790 | 10 | 3 | 1 | - | - | - | - | - | 990 | 822 |
| 451 | 160 | 1,711 | 22 | 3 | - | - | - | - | - | - | 1,896 | 1768 |
| 452 | 313 | 1,558 | 55 | 10 | 2 | 1 | 1 | - | - | - | 1,940 | 1718 |
| 453 | 547 | 3,581 | 77 | 20 | 11 | 5 | - | - | 1 | 2 | 4,244 | 3910 |
| GRAND TOTAL | 10,617 | 74,101 | 2,587 | 888 | 485 | 236 | 181 | 108 | 73 | 115 | 89,391 | 90,447 |

Years of Construction

TABLE : TOTAL NUMBER OF PRIVATE RESIDENCES ACCORDING TO YEAR OF CONSTRUCTION AND ZONE

| Zone No. | 1980 | 1979 | 1978 | 1977 | 1976 | 1975 | 1974 | 1973 | 1972 | 1971 | 1970 | 1960-69 | 1950-59 | Before 1950 | Unknown | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | - | - | - | - | - | - | - | - | - | - | 3 | 46 | 6 | 61 | 15 | 131 |
| 112 | - | - | - | - | 1 | 1 | - | - | - | - | - | 14 | 10 | 32 | 21 | 79 |
| 113 | 2 | 4 | 3 | 2 | 13 | 7 | 5 | - | 15 | - | 2 | 36 | 70 | 197 | 56 | 412 |
| 114 | 2 | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 16 | 23 | 193 | 84 | 323 |
| 121 | 2 | 4 | 3 | 3 | 6 | 3 | 13 | - | 5 | - | 11 | 144 | 62 | 312 | 143 | 711 |
| 122 | 2 | 5 | 3 | 16 | 10 | 8 | 39 | 5 | 8 | 5 | 2 | 95 | 88 | 93 | 94 | 473 |
| 123 | 7 | - | 7 | 1 | - | - | - | - | 1 | - | - | 3 | 7 | 12 | 162 | 200 |
| 211 | - | - | - | - | - | 1 | - | - | - | - | 1 | 16 | 5 | 7 | 68 | 98 |
| 212 | - | - | 1 | - | - | 1 | - | - | 2 | - | - | 3 | 3 | 103 | 128 | 241 |
| 213 | 1 | 2 | 1 | - | - | - | 1 | 1 | 3 | 3 | 5 | 25 | 17 | 19 | 154 | 232 |
| 221 | 1 | 2 | 5 | 9 | 11 | 9 | 4 | 2 | - | 1 | 12 | 57 | 76 | 124 | 292 | 605 |
| 222 | - | 6 | 3 | 1 | 2 | 2 | 1 | 3 | - | 1 | 4 | 128 | 78 | 103 | 331 | 663 |
| 223 | - | - | - | 25 | - | - | 2 | - | - | - | 1 | 9 | 10 | 16 | 182 | 245 |
| 224 | 1 | 1 | 4 | - | - | - | - | 2 | 2 | - | 1 | 21 | 19 | 12 | 29 | 92 |
| 226 | - | 5 | 38 | 2 | 169 | - | - | - | - | - | - | - | - | - | 31 | 245 |
| 231 | 1 | 2 | 13 | 15 | 6 | 1 | 3 | 6 | - | 2 | 12 | 239 | 35 | 87 | 160 | 582 |
| 232 | 2 | 21 | 174 | 123 | 48 | 44 | 3 | 3 | 24 | - | 9 | 75 | 8 | 31 | 95 | 660 |
| 241 | 1 | 6 | 10 | 9 | 67 | 28 | 1 | 11 | - | - | 16 | 183 | 116 | 165 | 363 | 976 |
| 242 | 4 | 3 | 2 | 4 | 17 | 50 | 40 | 55 | 101 | 41 | 228 | 1395 | 1 | 1 | 46 | 1988 |
| 243 | - | 13 | 2 | 4 | 19 | 18 | 49 | 96 | 127 | 6 | 129 | 438 | - | - | 207 | 1108 |
| 251 | 5 | 2 | - | - | 2 | 3 | 2 | - | 4 | - | 694 | 634 | 118 | 140 | 228 | 1832 |
| 252 | - | - | - | 47 | 42 | 112 | 2 | 1 | - | 109 | 2 | 364 | 85 | 74 | 125 | 963 |
| 261 | - | 51 | 240 | 205 | 110 | 6 | 117 | - | 1 | - | - | - | - | - | - | 730 |
| 262 | 4 | 3 | - | 55 | 972 | 578 | 44 | 3 | - | - | - | - | - | - | 1 | 1660 |
| 263 | 47 | 623 | 42 | 13 | 3 | - | - | - | - | - | - | 4 | - | - | 5 | 737 |
| 264 | - | 270 | - | 5 | - | 1 | - | - | - | - | - | - | - | - | 9 | 285 |
| 265 | - | 2 | 35 | 20 | 9 | 266 | - | - | - | - | - | - | - | - | 51 | 383 |
| 271 | - | 4 | 1 | 7 | 7 | 4 | 19 | 2 | 3 | - | 28 | 135 | 87 | 15 | 118 | 430 |
| 272 | 9 | 16 | 64 | 54 | 68 | 72 | 50 | 34 | 20 | 12 | 20 | 326 | 57 | 35 | 88 | 925 |
| 281 | - | 6 | 5 | 53 | 48 | 55 | 24 | 86 | 161 | 5 | 37 | 270 | 36 | 11 | 184 | 981 |
| 311 | 6 | 12 | 21 | 29 | 23 | 39 | 22 | 18 | 15 | 9 | 62 | 310 | 194 | 101 | 460 | 1321 |
| 312 | - | 1 | 3 | - | 2 | 6 | - | - | 2 | - | - | 18 | 4 | - | 34 | 70 |
| 313 | 1 | 1 | 2 | 1 | 147 | 61 | 8 | 20 | 1 | - | 41 | 135 | - | - | 13 | 431 |
| 314 | 36 | 93 | 108 | 111 | 85 | 33 | 46 | 23 | 31 | 47 | 83 | 542 | 116 | 1 | 174 | 1529 |
| 315 | 20 | 31 | 41 | 43 | 48 | 34 | 29 | 14 | 22 | 9 | 40 | 261 | 607 | 132 | 279 | 1610 |
| 321 | 10 | 35 | 58 | 52 | 45 | 93 | 37 | 30 | 87 | 10 | 85 | 479 | 443 | 143 | 190 | 1797 |
| 322 | 16 | 22 | 31 | 298 | 271 | 739 | 37 | 187 | 35 | 34 | 194 | 267 | 104 | 38 | 122 | 2395 |
| 323 | 12 | 35 | 62 | 76 | 67 | 129 | 72 | 46 | 70 | 43 | 84 | 91 | 19 | 11 | 206 | 1023 |
| 324 | 5 | 18 | 21 | 20 | 20 | 14 | 33 | 21 | 16 | 5 | 59 | 107 | 2 | - | 27 | 368 |
| 325 | 3 | 5 | 15 | 12 | 29 | 38 | 8 | 14 | 7 | 8 | 151 | 284 | 36 | 7 | 52 | 669 |
| 331 | 8 | 33 | 28 | 67 | 78 | 60 | 41 | 36 | 15 | 10 | 26 | 241 | 46 | 8 | 109 | 806 |
| 332 | 22 | 66 | 102 | 118 | 186 | 203 | 148 | 161 | 86 | 52 | 157 | 1115 | 476 | 13 | 387 | 3292 |
| 333 | 19 | 80 | 101 | 135 | 132 | 94 | 74 | 65 | 45 | 26 | 70 | 251 | 9 | 43 | 125 | 1269 |
| 341 | 12 | 25 | 54 | 63 | 78 | 83 | 98 | 97 | 75 | 38 | 76 | 439 | 335 | 68 | 242 | 1783 |
| 342 | 12 | 44 | 54 | 305 | 47 | 81 | 51 | 41 | 19 | 27 | 131 | 455 | 243 | 2 | 144 | 1656 |
| 351 | 9 | 27 | 31 | 134 | 142 | 416 | 393 | 148 | 61 | 26 | 87 | 340 | 45 | 55 | 395 | 2309 |
| 352 | 19 | 52 | 55 | 58 | 70 | 72 | 33 | 39 | 27 | 17 | 26 | 33 | - | 2 | 98 | 601 |
| 353 | 3 | 5 | 7 | 16 | 15 | 22 | 12 | 8 | 8 | 10 | 13 | 7 | - | - | 40 | 166 |
| 361 | 6 | 9 | 8 | 22 | 12 | 16 | 8 | 13 | 7 | 6 | 6 | 14 | 2 | 37 | 22 | 188 |
| 411 | 23 | 51 | 57 | 54 | 57 | 58 | 36 | 42 | 35 | 19 | 76 | 237 | 88 | 43 | 14 | 890 |
| 412 | 6 | 28 | 39 | 27 | 14 | 18 | 7 | 23 | 12 | 5 | 26 | 105 | 55 | 88 | 14 | 467 |
| 413 | 4 | 24 | 29 | 41 | 84 | 51 | 22 | 26 | 27 | 9 | 78 | 323 | 123 | 26 | 184 | 1051 |
| 414 | 18 | 57 | 83 | 154 | 122 | 147 | 83 | 71 | 71 | 81 | 152 | 420 | 282 | 136 | 314 | 2191 |
| 421 | 31 | 68 | 65 | 76 | 105 | 107 | 46 | 52 | 45 | 27 | 131 | 286 | 331 | 193 | 404 | 1967 |
| 422 | 20 | 115 | 263 | 447 | 111 | 351 | 108 | 281 | 133 | 102 | 354 | 1159 | 458 | 448 | 154 | 4504 |
| 423 | 30 | 54 | 151 | 87 | 49 | 155 | 44 | 69 | 34 | 25 | 44 | 420 | 117 | 26 | 123 | 1428 |
| 424 | 17 | 26 | 16 | 11 | 60 | 32 | 26 | 200 | 9 | 5 | 26 | 137 | 125 | 38 | 1 | 729 |
| 431 | 61 | 120 | 148 | 116 | 109 | 157 | 97 | 80 | 50 | 33 | 132 | 824 | 342 | 273 | 169 | 2711 |
| 432 | 11 | 36 | 44 | 14 | 35 | 23 | 20 | 19 | 20 | 50 | 39 | 315 | 76 | 6 | 4 | 712 |
| 441 | 2 | 11 | 14 | 28 | 35 | 53 | 21 | 6 | 6 | 1 | 7 | 201 | 72 | 5 | 34 | 496 |
| 442 | 2 | 2 | 60 | 10 | 3 | 5 | 8 | 3 | 6 | 1 | 29 | 30 | 2 | 52 | 1 | 214 |

| Zone | 1980 | 1979 | 1978 | 1977 | 1976 | 1975 | 1974 | 1973 | 1972 | 1971 | 1970 | 1960-69 | 1950-59 | Before 1950 | Unknown | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 443 | 3 | 5 | 11 | 14 | 12 | 15 | 3 | 6 | 9 | - | 36 | 223 | 180 | 70 | 325 | 912 |
| 444 | 6 | 23 | 26 | 46 | 40 | 62 | 20 | 66 | 20 | 58 | 91 | 688 | 232 | 35 | 76 | 1489 |
| 361 - 4 | 9 | 36 | 121 | 129 | 176 | 53 | 143 | 67 | 33 | 12 | 28 | 158 | 151 | 37 | 254 | 1407 |
| 362 | 45 | 37 | 16 | 20 | 38 | 66 | 23 | 1 | 2 | 7 | 3 | 1 | - | 25 | 94 | 378 |
| 363 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 364 | 6 | 93 | 270 | 485 | 317 | 390 | 31 | 8 | 8 | 20 | 6 | 41 | 44 | 18 | 141 | 1878 |
| 371 | 10 | 10 | 2 | 24 | 17 | 23 | 11 | 7 | 1 | - | 18 | 114 | 80 | 69 | 154 | 540 |
| 372 | 6 | 54 | 104 | 47 | 72 | 166 | 147 | 58 | 48 | 22 | 75 | 294 | 196 | 54 | 208 | 1551 |
| 373 | 2 | - | 1 | - | 8 | 1 | 16 | 2 | - | - | 3 | 14 | 8 | 31 | 286 | 372 |
| 374 | 14 | 36 | 60 | 68 | 46 | 23 | 24 | 17 | 2 | 4 | 2 | 293 | - | 1 | 112 | 702 |
| 461 | 17 | 20 | 41 | 24 | 18 | 43 | 58 | 73 | 10 | 4 | 23 | 281 | 66 | 8 | 334 | 1020 |
| 462 | 15 | 47 | 27 | 33 | 18 | 23 | 14 | 6 | 112 | 105 | 26 | 97 | 53 | 160 | 68 | 804 |
| 451 | 25 | 73 | 105 | 40 | 41 | 31 | 33 | 84 | 43 | 17 | 49 | 1133 | 17 | 3 | 32 | 1726 |
| 452 | 5 | 22 | 30 | 6 | 17 | 180 | 45 | 95 | 98 | 6 | 31 | 393 | 259 | 87 | 265 | 1539 |
| 453 | 23 | 114 | 141 | 168 | 215 | 184 | 154 | 144 | 81 | 59 | 219 | 945 | 475 | 368 | 381 | 3671 |
| Grand Total | 721 | 2807 | 3383 | 4402 | 4947 | 5920 | 2809 | 2797 | 2022 | 1234 | 4314 | 19197 | 7530 | 4804 | 10735 | 77622 |

TYPE OF LIVING QUARTERS

TABLE : TOTAL NUMBER OF RESIDENCES ACCORDING TO HOUSEHOLD NUMBER AND TOTAL NUMBER OF HOUSEHOLDS IN EACH ZONE (PRIVATE HOUSING UNIT)

| ZONE NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | TOT. PRIVATE H.U. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | - | - | 76 | - | 1 | 62 | - | - | - | - | - | - | - | 139 |
| 112 | 7 | 3 | 19 | - | - | 43 | - | 6 | 2 | - | - | - | - | 80 |
| 113 | 111 | 67 | 118 | - | 7 | 42 | - | 55 | 38 | - | 1 | 1 | - | 440 |
| 114 | 30 | 32 | 53 | - | 5 | 176 | - | 44 | 15 | - | 42 | 2 | - | 399 |
| 121 | 202 | 81 | 230 | - | 96 | - | - | 8 | 110 | 6 | - | 8 | - | 741 |
| 122 | 71 | 160 | 179 | - | 30 | - | - | 1 | 16 | 1 | - | 29 | - | 487 |
| 123 | 18 | 1 | 5 | - | - | 128 | - | 32 | 64 | 2 | - | 82 | - | 332 |
| 211 | 38 | 36 | 30 | - | - | - | - | 1 | - | - | - | - | - | 105 |
| 212 | 22 | 40 | 38 | - | 146 | 1 | - | - | - | - | - | - | - | 247 |
| 213 | 139 | 64 | 37 | - | - | - | - | - | - | - | - | - | - | 240 |
| 221 | 303 | 121 | 152 | - | 1 | 10 | 1 | 2 | 22 | - | - | 1 | - | 613 |
| 222 | 302 | 185 | 138 | - | 37 | 13 | - | 11 | 12 | 1 | - | - | - | 699 |
| 223 | 38 | 138 | 23 | - | 52 | - | - | 1 | - | - | - | 2 | - | 254 |
| 224 | 69 | 24 | - | - | - | - | - | - | - | - | - | - | - | 93 |
| 225 | - | - | - | - | 249 | - | - | - | - | - | - | - | - | 249 |
| 231 | 340 | 91 | 129 | - | 29 | 31 | 1 | - | - | - | - | 1 | - | 622 |
| 232 | 125 | 149 | 422 | - | 8 | 138 | 1 | 2 | 23 | - | - | - | - | 868 |
| 241 | 472 | 158 | 332 | - | - | 27 | - | 17 | 37 | - | - | 2 | - | 1045 |
| 242 | 108 | 425 | 1468 | - | - | 48 | - | 73 | - | - | - | - | - | 2122 |
| 243 | 663 | 65 | 389 | - | 44 | 8 | - | 4 | - | - | 1 | - | - | 1174 |
| 251 | 144 | 278 | 288 | - | 1062 | 86 | - | 14 | 5 | - | 1 | 6 | - | 1884 |
| 252 | 45 | 299 | 248 | - | 395 | 8 | - | 16 | 1 | - | - | - | - | 1012 |
| 261 | 7 | 73 | 604 | - | 3 | 55 | 1 | 12 | 22 | - | - | - | - | 777 |
| 262 | 81 | 310 | 1018 | - | 24 | 297 | 3 | 2 | 4 | - | - | - | - | 1739 |
| 263 | 3 | 154 | 515 | - | - | 246 | - | 5 | - | - | - | 3 | - | 926 |
| 264 | 9 | 36 | 717 | - | - | 68 | - | 38 | - | - | - | 5 | - | 873 |
| 265 | 12 | 89 | 321 | - | - | - | - | - | - | - | - | - | - | 422 |
| 271 | 78 | 63 | 167 | - | 75 | 54 | - | 6 | 16 | 2 | - | 1 | - | 462 |
| 272 | 499 | 135 | 148 | - | 160 | 38 | - | 1 | - | 1 | 2 | 3 | - | 987 |
| 281 | 307 | 436 | 244 | - | - | 31 | - | 1 | 1 | 7 | - | - | - | 1027 |
| 311 | 685 | 125 | 1198 | - | - | 50 | - | 5 | 98 | - | - | 5 | 1 | 2167 |
| 312 | 17 | 15 | 3 | - | 32 | - | - | - | 1 | 2 | - | 1 | - | 71 |
| 313 | 26 | 12 | 16 | - | 368 | 1 | - | 25 | - | - | - | - | - | 448 |
| 314 | 1251 | 184 | 72 | - | - | 13 | - | 16 | 13 | 10 | - | 1 | - | 1560 |
| 315 | 618 | 429 | 514 | - | 53 | 23 | - | 2 | 3 | 2 | - | 4 | - | 1648 |
| 321 | 748 | 424 | 431 | - | 78 | 63 | 1 | 85 | 4 | 1 | 2 | 1 | - | 1838 |
| 322 | 468 | 160 | 1867 | - | 30 | 27 | - | 2 | 21 | 1 | 10 | 3 | - | 2589 |
| 323 | 529 | 231 | 325 | - | 2 | 4 | - | - | 2 | 1 | - | 6 | - | 1100 |
| 324 | 247 | 81 | 34 | - | 80 | 1 | - | - | - | - | - | - | - | 443 |
| 325 | 279 | 63 | 413 | - | - | - | - | 2 | - | - | - | 1 | - | 758 |
| 331 | 635 | 146 | 33 | - | 4 | 18 | - | 4 | 7 | 1 | - | - | - | 848 |
| 332 | 2175 | 683 | 459 | - | - | 2 | - | 3 | 49 | - | - | - | - | 3371 |
| 333 | 711 | 205 | 383 | - | - | 1 | - | 1 | 1 | - | - | 16 | - | 1318 |
| 341 | 877 | 245 | 408 | - | 221 | 4 | 3 | 11 | 74 | 2 | 2 | 1 | - | 1848 |
| 342 | 867 | 146 | 504 | - | 1 | 9 | - | 12 | 186 | 1 | 1 | 10 | - | 1737 |
| 351 | 561 | 981 | 816 | - | 1 | 30 | - | 50 | 12 | 19 | 2 | 2 | - | 2474 |
| 352 | 514 | 56 | 74 | - | - | 1 | - | 1 | - | - | - | 1 | - | 647 |
| 353 | 158 | 29 | 34 | - | - | 1 | - | - | - | - | - | - | - | 222 |
| 361 | 127 | 18 | 50 | - | - | - | - | 1 | - | - | - | 1 | - | 197 |
| 411 | 916 | 95 | 77 | - | - | - | - | 1 | - | - | - | 10 | - | 1099 |
| 412 | 247 | 34 | 304 | - | - | - | - | 6 | - | 1 | - | - | - | 592 |
| 413 | 336 | 178 | 591 | - | - | 29 | 2 | 16 | - | 2 | 1 | - | - | 1155 |
| 414 | 1153 | 340 | 714 | 0 | 4 | 15 | - | 93 | 20 | - | - | 4 | - | 2343 |
| 421 | 985 | 258 | 751 | - | 116 | 35 | - | 75 | - | - | 2 | 2 | - | 2224 |
| 422 | 1378 | 1017 | 1838 | - | 62 | 447 | - | 161 | 7 | 2 | 3 | 14 | - | 4929 |
| 423 | 829 | 369 | 323 | - | 4 | - | - | 14 | - | - | - | 4 | - | 1543 |
| 424 | 274 | 96 | 454 | - | - | 8 | - | 4 | - | - | - | 2 | - | 838 |
| 431 | 1989 | 291 | 728 | - | 2 | 12 | 1 | 19 | - | 3 | - | 9 | - | 3054 |
| 432 | 608 | 55 | 79 | - | - | 1 | - | 3 | 1 | - | - | 1 | - | 748 |
| 441 | 205 | 20 | 157 | - | 195 | - | - | - | 1 | 2 | - | 6 | - | 586 |
| 442 | 172 | 8 | 75 | - | - | 2 | - | 1 | - | - | - | 2 | - | 260 |
| | | | | | | | | | | | | | (166) | |

MPJB

TYPE OF LIVING QUARTERS (PRIVATE)

| ZONE NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | TOT. PRIVATE H.U. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 443 | 205 | 119 | 666 | - | 95 | - | - | 3 | 5 | - | - | - | - | 1093 |
| 444 | 897 | 553 | 412 | - | - | 3 | - | 13 | 3 | - | - | - | - | 1881 |
| 361-4 | 485 | 164 | 641 | - | 22 | 128 | - | 116 | 14 | - | - | 1 | - | 1571 |
| 362 | 106 | 58 | 232 | - | - | - | - | 6 | - | 2 | - | - | - | 404 |
| 363 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 364 | 258 | 53 | 562 | - | 1244 | - | - | 17 | 3 | - | - | - | - | 2137 |
| 371 | 208 | 78 | 299 | - | - | 14 | - | 24 | - | - | 1 | - | - | 624 |
| 372 | 783 | 249 | 514 | - | 1 | 142 | 1 | 1 | 1 | 19 | 5 | 3 | - | 1719 |
| 373 | 41 | 164 | 177 | - | - | - | 1 | - | - | - | - | - | - | 383 |
| 374 | 580 | 28 | 132 | - | - | 1 | - | - | - | - | - | - | - | 741 |
| 461 | 481 | 385 | 345 | - | - | 1 | - | 2 | - | - | - | 1 | - | 1215 |
| 462 | 380 | 133 | 421 | - | - | - | - | 3 | - | - | - | - | - | 937 |
| 451 | 1677 | 34 | 115 | - | 1 | 2 | - | 1 | - | - | - | - | - | 1830 |
| 452 | 418 | 139 | 1009 | - | 189 | 56 | - | 9 | - | - | - | 3 | - | 1823 |
| 453 | 2170 | 691 | 887 | - | 69 | 185 | 1 | 35 | 3 | 2 | 1 | 8 | - | 4052 |
| GRAND TOTAL | 33517 | 13555 | 28245 | - | 5298 | 2939 | 17 | 1195 | 917 | 93 | 77 | 269 | 1 | 86123 |

TYPE OF LIVING QUARTERS (NON PRIVATE)

| ZONE NO. | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | TOTAL NON PRIVATE | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | 44 | 4 | - | - | 2 | 2 | - | - | - | - | - | 4 | 191 |
| 112 | 4 | - | - | - | - | - | - | - | - | - | - | - | 84 |
| 113 | 114 | 2 | - | - | 14 | - | - | - | - | 1 | - | 15 | 571 |
| 114 | 135 | - | - | - | 1 | - | - | - | - | 8 | 1 | 10 | 544 |
| 121 | 55 | 4 | - | - | - | - | 1 | 1 | - | - | - | 2 | 802 |
| 122 | 7 | 4 | - | - | - | - | 2 | - | - | - | - | 2 | 500 |
| 123 | 1 | - | - | - | - | - | - | - | - | 1 | - | 1 | 334 |
| 211 | - | - | - | - | - | - | - | - | - | - | - | - | 105 |
| 212 | - | - | - | - | - | 18 | 1 | - | - | 1 | - | 20 | 267 |
| 213 | 2 | - | - | - | 2 | - | 1 | - | - | 4 | - | 7 | 249 |
| 221 | 7 | - | - | - | - | - | 1 | - | - | - | - | 1 | 621 |
| 222 | 6 | 1 | - | - | 1 | 1 | 5 | - | - | 1 | 1 | 9 | 715 |
| 223 | 3 | - | - | - | - | - | - | - | - | - | - | - | 257 |
| 224 | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 94 |
| 225 | - | - | - | - | - | - | - | - | - | 2 | - | 2 | 251 |
| 231 | 3 | - | - | - | - | - | - | - | - | - | - | - | 625 |
| 232 | 30 | 1 | - | - | 19 | - | - | - | - | 2 | 1 | 22 | 921 |
| 241 | 34 | 1 | - | - | - | - | 1 | - | - | - | - | 1 | 1081 |
| 242 | 130 | 2 | - | 1 | 7 | - | - | - | - | 2 | - | 9 | 2264 |
| 243 | 80 | - | - | - | 1 | - | - | - | - | 3 | 1 | 5 | 1259 |
| 251 | 32 | 3 | - | - | 1 | - | 1 | - | - | 21 | - | 23 | 1942 |
| 252 | 47 | - | - | - | - | 2 | 1 | 2 | - | 2 | 4 | 11 | 1070 |
| 261 | 23 | - | - | - | 5 | - | - | - | - | 1 | - | 6 | 806 |
| 262 | 132 | 2 | - | - | 4 | - | - | - | - | - | - | 4 | 1877 |
| 263 | 11 | - | - | - | 1 | - | - | - | - | 4 | 2 | 7 | 944 |
| 264 | 75 | 1 | - | - | - | - | - | - | - | 8 | - | 8 | 957 |
| 265 | 1 | - | - | - | - | - | - | - | - | - | - | - | 423 |
| 271 | 22 | - | - | 1 | 4 | - | - | - | - | - | - | 4 | 489 |
| 272 | 8 | 1 | - | - | - | - | - | - | - | 2 | 1 | 3 | 999 |
| 281 | 38 | 3 | - | - | 1 | - | - | - | - | - | 1 | 2 | 1070 |
| 311 | 20 | - | - | - | 1 | 3 | - | - | - | 8 | 1 | 13 | 2200 |
| 312 | 1 | 1 | - | - | 1 | - | 7 | - | - | 1 | 1 | 10 | 83 |
| 313 | - | - | - | - | - | - | 11 | - | 1 | - | - | 12 | 460 |
| 314 | 27 | - | - | - | 11 | - | - | 16 | - | 6 | - | 33 | 1620 |
| 315 | 20 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | 1670 |
| 321 | 12 | - | 1 | - | 2 | - | - | - | - | 1 | 1 | 4 | 1855 |
| 322 | 7 | 1 | - | - | 1 | 1 | - | - | - | 6 | - | 8 | 2605 |
| 323 | 2 | 2 | - | 1 | 1 | 2 | - | 1 | - | - | - | 4 | 1109 |
| 324 | 5 | 1 | - | 1 | - | - | - | - | - | - | - | - | 450 |
| 325 | 3 | - | - | - | - | - | - | - | - | 1 | - | 1 | 762 |
| 331 | 28 | - | - | - | - | - | - | - | - | 1 | - | 1 | 877 |
| 332 | 9 | 3 | 1 | - | - | - | - | - | - | - | 1 | 1 | 3385 |
| 333 | 8 | - | - | - | - | - | - | - | - | - | - | - | 1326 |
| 341 | 76 | 5 | - | - | 26 | 2 | - | - | 2 | - | 19 | 49 | 1978 |
| 342 | 28 | 1 | - | - | - | - | - | - | - | - | - | - | 1766 |
| 351 | 20 | 2 | - | - | 1 | - | - | 6 | - | 14 | - | 21 | 2517 |
| 352 | - | 1 | - | - | - | - | - | - | - | - | 3 | 3 | 651 |
| 353 | - | 3 | - | - | - | - | - | - | - | 1 | - | 1 | 226 |
| 361 | - | - | - | - | - | - | - | - | - | 1 | - | 1 | 198 |
| 411 | 117 | 35 | - | - | - | - | - | - | - | - | 1 | 1 | 1252 |
| 412 | 64 | 7 | 3 | - | - | - | - | - | - | - | - | - | 666 |
| 413 | 15 | - | - | - | - | - | - | - | - | 25 | - | 25 | 1195 |
| 414 | 62 | 6 | 1 | - | - | - | - | 2 | 1 | 78 | - | 81 | 2493 |
| 421 | 11 | 1 | 1 | - | 1 | - | 1 | - | - | 5 | 1 | 8 | 2245 |
| 422 | 177 | 3 | 3 | - | 4 | - | - | 1 | 1 | 2 | - | 8 | 5120 |
| 423 | 5 | - | - | 1 | - | - | - | - | 2 | - | 1 | 3 | 1552 |
| 424 | 3 | - | - | - | 1 | - | - | - | - | 4 | - | 5 | 846 |
| 431 | 63 | 7 | 23 | - | - | - | 1 | - | - | 4 | - | 5 | 3152 |
| 432 | 10 | 2 | 1 | - | 1 | - | - | - | - | 1 | - | 2 | 763 |
| 441 | - | - | - | 1 | - | - | - | - | - | - | - | - | 587 |
| 442 | 9 | 2 | - | - | 1 | - | - | - | - | - | 1 | 2 | 273 |

TYPE OF LIVING QUARTERS

| ZONE NO. | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | TOTAL NON-PRIVATE | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 443 | 6 | - | - | - | - | - | - | - | - | - | 2 | 2 | 1101 |
| 444 | 51 | 1 | - | - | - | - | - | - | - | - | - | - | 1933 |
| 361-4 | 50 | 2 | - | - | 3 | - | - | - | - | 2 | - | 5 | 1628 |
| 362 | 1 | - | - | - | - | - | - | - | - | - | - | - | 405 |
| 363 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 364 | 6 | - | - | - | - | - | - | - | - | - | - | - | 2143 |
| 371 | 24 | 2 | - | - | - | - | - | 1 | - | 1 | 1 | 3 | 653 |
| 372 | 85 | 7 | - | - | 1 | - | - | 1 | - | 7 | 2 | 11 | 1822 |
| 373 | - | - | - | - | - | - | - | - | - | - | - | - | 383 |
| 374 | 3 | - | - | - | - | - | - | - | - | - | - | - | 744 |
| 461 | 93 | 2 | 2 | - | - | 1 | - | - | - | 2 | - | 3 | 1315 |
| 462 | 53 | - | - | - | - | - | - | - | - | - | - | - | 990 |
| 451 | 64 | 1 | - | - | - | - | - | 1 | - | - | - | 1 | 1896 |
| 452 | 33 | - | - | - | 2 | - | 1 | - | - | 8 | 73 | 84 | 1940 |
| 453 | 145 | 8 | 7 | - | 19 | 1 | - | - | 1 | 10 | 1 | 32 | 4244 |
| GRAND TOTAL | 2460 | 136 | 43 | 6 | 140 | 33 | 36 | 32 | 8 | 253 | 121 | 623 | 89391 |

Note:

"Total Non-Private" is the sum of codes 18-24 only. Codes 14-17 are referred to as "Marginal Housing Units" and are not considered genuinely "Non-Private".

TABLE : TOTAL NUMBER OF PRIVATE RESIDENCES, ACCORDING T
CONDITION OF BUILDING AND ZONE

| Zone | CONDITION Sound | Deteriora-ting | Dilapid-ated | Total |
|---|---|---|---|---|
| 111 | 132 | 5 | 2 | 139 |
| 112 | 80 | - | - | 80 |
| 113 | 335 | 102 | 3 | 440 |
| 114 | 299 | 60 | 40 | 399 |
| 121 | 645 | 82 | 14 | 741 |
| 122 | 410 | 29 | 48 | 487 |
| 123 | 327 | 3 | 2 | 332 |
| 211 | 105 | - | - | 105 |
| 212 | 196 | 47 | 4 | 247 |
| 213 | 224 | 15 | 1 | 240 |
| 221 | 545 | 68 | - | 613 |
| 222 | 630 | 58 | 11 | 699 |
| 223 | 248 | 6 | - | 254 |
| 224 | 79 | 14 | - | 93 |
| 225 | 249 | - | - | 249 |
| 231 | 607 | 15 | - | 622 |
| 232 | 853 | 15 | - | 868 |
| 241 | 916 | 110 | 19 | 1045 |
| 242 | 2109 | 13 | - | 2122 |
| 243 | 1172 | 2 | - | 1174 |
| 251 | 1826 | 54 | 4 | 1884 |
| 252 | 1007 | 5 | - | 1012 |
| 261 | 777 | - | - | 777 |
| 262 | 1735 | 4 | - | 1739 |
| 263 | 920 | 6 | - | 926 |
| 264 | 852 | 21 | - | 873 |
| 265 | 417 | 5 | - | 422 |
| 271 | 448 | 14 | - | 462 |
| 272 | 970 | 17 | - | 987 |
| 281 | 1007 | 17 | 3 | 1027 |
| 311 | 1723 | 395 | 49 | 2167 |
| 312 | 68 | 1 | 2 | 71 |
| 313 | 447 | 1 | - | 448 |
| 314 | 1543 | 15 | 2 | 1560 |
| 315 | 1569 | 75 | 4 | 1648 |
| 321 | 1683 | 143 | 12 | 1838 |
| 322 | 2557 | 26 | 6 | 2589 |
| 323 | 1025 | 66 | 9 | 1100 |
| 324 | 381 | 59 | 3 | 443 |
| 325 | 617 | 119 | 22 | 758 |
| 331 | 809 | 31 | 8 | 848 |
| 332 | 3255 | 112 | 4 | 3371 |
| 333 | 1249 | 68 | 1 | 1318 |
| 341 | 1801 | 47 | - | 1848 |
| 342 | 1714 | 22 | 1 | 1737 |
| 351 | 2318 | 141 | 15 | 2474 |
| 352 | 625 | 20 | 2 | 647 |
| 353 | 208 | 11 | 3 | 222 |
| 361 | 139 | 53 | 5 | 197 |
| 411 | 997 | 86 | 16 | 1099 |
| 412 | 492 | 78 | 22 | 592 |
| 413 | 1034 | 99 | 22 | 1155 |
| 414 | 2072 | 241 | 30 | 2343 |
| 421 | 1907 | 257 | 60 | 2224 |
| 422 | 4325 | 472 | 132 | 4929 |
| 423 | 1473 | 55 | 15 | 1543 |
| 424 | 755 | 73 | 10 | 838 |
| 431 | 2585 | 388 | 81 | 3054 |
| 432 | 690 | 56 | 2 | 748 |
| 441 | 549 | 28 | 9 | 586 |
| 442 | 224 | 31 | 5 | 260 |

| Zone. | Sound | Deterlora-ting | Dilapid-ated | | Total | | |
|---|---|---|---|---|---|---|---|
| 443 | 1064 | 27 | 2 | | 1093 | | |
| 444 | 1782 | 91 | 8 | | 1881 | | |
| 361-4 | 1337 | 203 | 31 | | 1571 | | |
| 362 | 360 | 41 | 3 | | 404 | | |
| 363 | - | - | - | | - | | |
| 364 | 2123 | 8 | 6 | | 2137 | | |
| 371 | 415 | 103 | 106 | | 624 | | |
| 372 | 1528 | 159 | 32 | | 1719 | | |
| 373 | 227 | 155 | 1 | | 383 | | |
| 374 | 606 | 124 | 11 | | 741 | | |
| 461 | 1089 | 108 | 18 | | 1215 | | |
| 462 | 793 | 124 | 20 | | 937 | | |
| 451 | 1749 | 74 | 7 | | 1830 | | |
| 452 | 1752 | 23 | 48 | | 1823 | | |
| 453 | 3843 | 164 | 45 | | 4052 | | |
| Grand Total | 79622 | 5460 | 1041 | | 86123 | | |