

Salinity Problem:

Salinity intrusion at the intakes of Dungun, Paka, Kerteh and Kemaman Rivers is a major problem for water supply (SCTWR). In order to solve the problems of salinity intrusion at the intakes, there are two solutions: (1) to change the location of intakes, and (2) to provide a barrage.

Detailed studied to decide a structural plan of the barrages together with location of intakes shall be implemented before river improvements are executed.

8.5.5 Recommendations

In accordance with the study findings, a development programme is proposed as described below, and Fig. 8.5 shows the location of these projects. They should be prepared and implemented with priority.

Priority and Programme

First Stage (Urgent):

- a. Cukai Town Drainage : Rapid development in the flood prone areas. Determine a surface drainage trunk network in the urban area coordinated with plans of river improvement, land use, road and others.
- b. Dungun Town Drainage : Determine an overall main drainage network and coordinate it with the ongoing drainage project in the central area.
- c. Main Roads along the Coast
 - Dungun : Local drainage and road raising, river improvement of the bottleneck
 - Paka : Road raising together with river improvement
 - Kerteh : Local drainage and road raising
 - Cukai : Local drainage and road raising

Second Stage:

- a. Jabor-Jerangau road and others in road raising and local drainage.
- b. Overall river plan covering the basin area for main rivers in the study area and implementation programme.

Third Stage:

Detailed design according to the programme and construction.

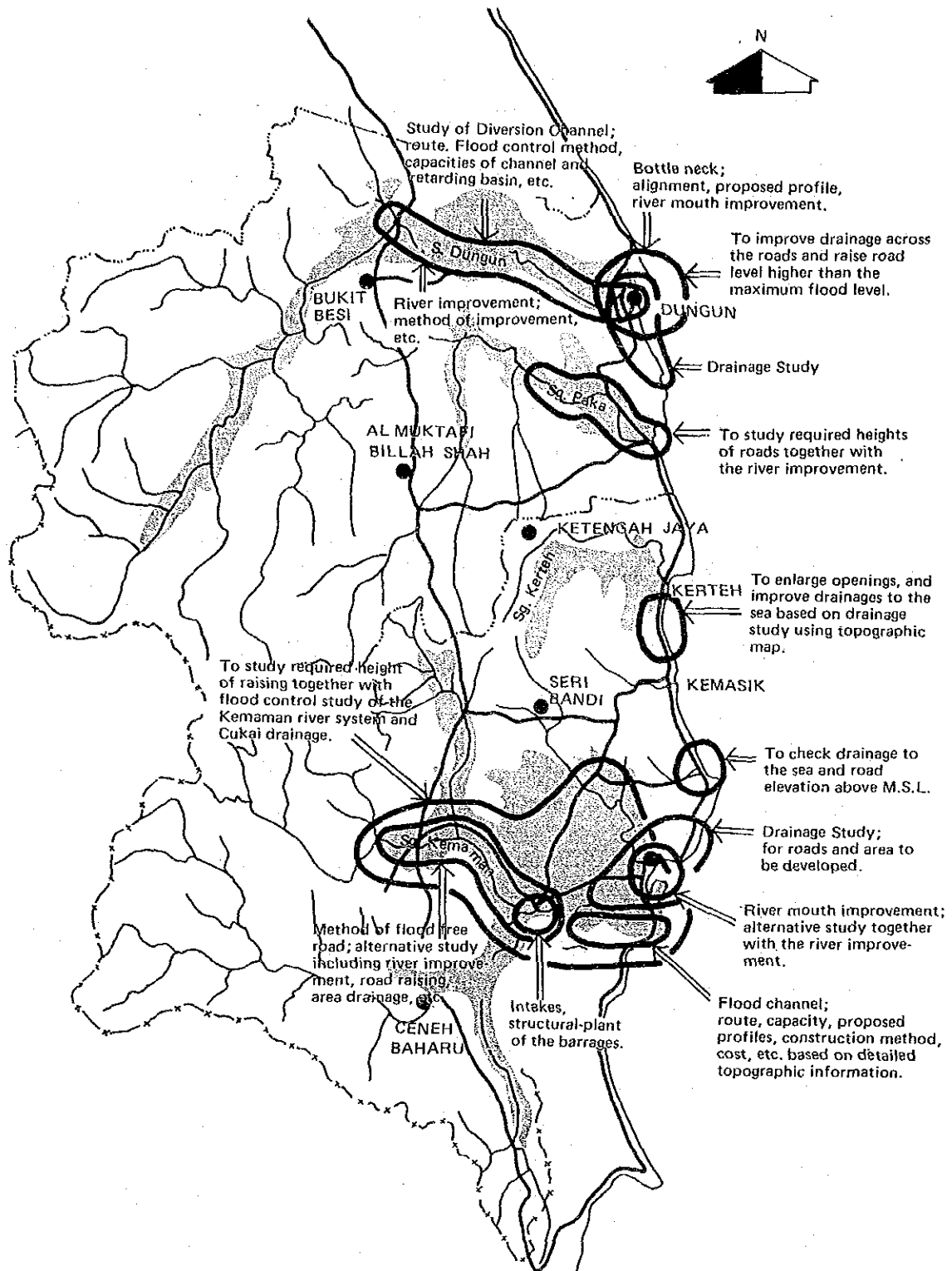


Fig. 8.5 RECOMMENDATION FOR FLOOD CONTROL PROGRAMME

8.6 TRANSPORTATION

8.6.1 Road System

Traffic Growth:

Based on the increased vehicle registration in the past ten years and referring to the traffic increase in the past, traffic volume is forecast as follows:

	Average annual increase (percent per annum)
1984 - 1990	11
1990 - 1995	9
1995 - 2000	7

Traffic will increase at a lower rate than the increase rate of vehicle registration, since as a general rule the annual vehicle mileage decreases when the ownership ratio increases substantially. Owners tend to use vehicles less intensively when the ownership is wider. Accordingly, it is assumed an overall growth of vehicle traffic will be 11% per annum up to 1990. The above estimate is quite similar to the forecast in TMPS.

It is estimated that route III in the study area will have the following traffic volume in 2000:

Marang - Dungun	19,000
Dungun - Cukai	18,000
Cukai - Kuantan	26,000

It should be noted that intra-urban traffic should be added on the sections passing through the urban areas of Dungun, Kerteh and Cukai. Jerangau-Jabor Highway and other roads in the KETENGAH area are estimated to have a daily traffic volume of 7,000 in 2000.

Current Improvement Plans:

There are many programmes for the improvement, upgrading, widening, new road construction, etc. currently being prepared by both JKR and KETENGAH for the Fourth Malaysia Plan. They are identified and shown in Fig. 8.6 and Table 8.12.

The calculated road capacities after completion of these improvement plans are compared with the estimated traffic of the year 2000 for major sections of Route III and Jerangau-Jabor Highway. It is considered that the current improvement plans can mostly provide the necessary road capacity to meet the traffic demand in the year 2000.

Recommendations for Road System Development:

- 1) JKR of Terengganu has performed maintenance and repair works well. This performance should be strengthened and continued in the coming years because increasing traffic will increase the wear and tear of the road structure more than in the past.
- 2) Road improvement plans as summarized in Table 8.12 and Fig. 8.6 should be implemented during the Fourth and Fifth Malaysia Plan periods. In addition, a bypass plan is recommended for Dungun from the viewpoint of diversifying through traffic from the intra-urban traffic movement. Route III will eventually become a four lane road in the study area, if this bypass and other JKR programs are completed.
- 3) Jerangau-Jabor Highway and other inland roads have a number of damaged sections although they were constructed only a few years ago.

The damages are attributed to several causes, including heavier than normal truck loading and the application of inadequate structural and surface design standards. A substantial rehabilitation work is recommended. JKR of Terengganu recognizes the necessity of rehabilitation beyond the normal maintenance work.

- 4) Some sections of the roads in the study area are inundated by floods during the rainy season. Sections susceptible to flooding should be improved in order to be free from traffic disruption and structural damage. This matter was simultaneously studied from the viewpoint of river flood control and drainage planning. Actions for (a) raising elevation of the road, (b) the improvement of river and (c) combined works of (a) and (b) for flood control measures should be studied and implemented. Examples of problem sections are as follows:

- Between Dungun and Paka of Route III, along the Paka river
- Between Air Putih and Cukai, along the Kemaman river

- 5) It is expected that there will be urbanization development in the towns along Route III. However, Route III has no provision for separating high speed traffic and slow bicycles and pedestrians. For the safety of these flows, an additional width of 1.5 m on both sides with a barrier/fence and a coarse surface treatment is recommended.
- 6) For the safety of traffic movement and pedestrians, traffic signals are recommended to be placed at points of conflict. Particularly in the urban areas signals should be installed at major junctions.

Table 8.12 Major New Road/Upgrading Projects in the Study Area³⁾

(In 1983 prices)

No.	Name of Project	Length (km)	Estimated Cost (\$1,000)
1	Jalan Seberang Pintasan/Raja Wali/Pulau Serai	3.7	700
2	Jalan Kuala Jengai/Pasir Raja	19.3	12,000
3	Jalan Al Muktafi Billah Shah/Pasir Raja (Feeder 6)	43.5	62,000
4	Jalan Tanah ke Rancangan Tanah Pinggir Tepus	8.0	1,750
5	Upgrading Jalan Kelas C Gong Pasir	9.6	1,500
6	Jalan Durian Mentangau/Rasau Kerteh	4.8	1,050
7	Jalan Tanan Santong/Batu Putih	3.2	700
8	Jalan Tanah ke Rancangan Tanah Pinggir Tanjung Remia	3.5	770
9	Town D/Ketengah Jaya	2.4	200
10	Telok Kalong Bypass/Nothern Extension	14.0	20,000
11	Improvement to MS61-77 of K.T./Kuantan Route III	25.6	10,000
12	Cukai Bypass/Southern Extension	12.5	33,400
13	Extension Feeder I	4.8	3,000
14	Jalan Kampong Mak Logam/Lubuk Batu/Ceneh Baharu	20.9	7,250
15	Jalan Seb. Taylor/Lubok Batu	9.6	N.A. ¹⁾
16	Jalan Pancor/Bukit Anak Dara	4.2	1,025
17	Jalan Rancangan Tanah Pinggir Bagus	6.6	880
18	Jalan Kg. Cabang/Kg. Kemasek (Bukit Changkul)	6.0	1,825
19	Jalan Payoh/Bujal/Padang Kemunting	6.4	1,650
20	Jalan Jerangau/Tok Kah	26.9	N.A. ¹⁾
Total		220.3 ²⁾ (235.5)	159,700

- Notes: 1) N.A. means data not available.
 2) Total in brackets includes improvements.
 3) In 1984 and Afterwards.

Source: JKR Terengganu

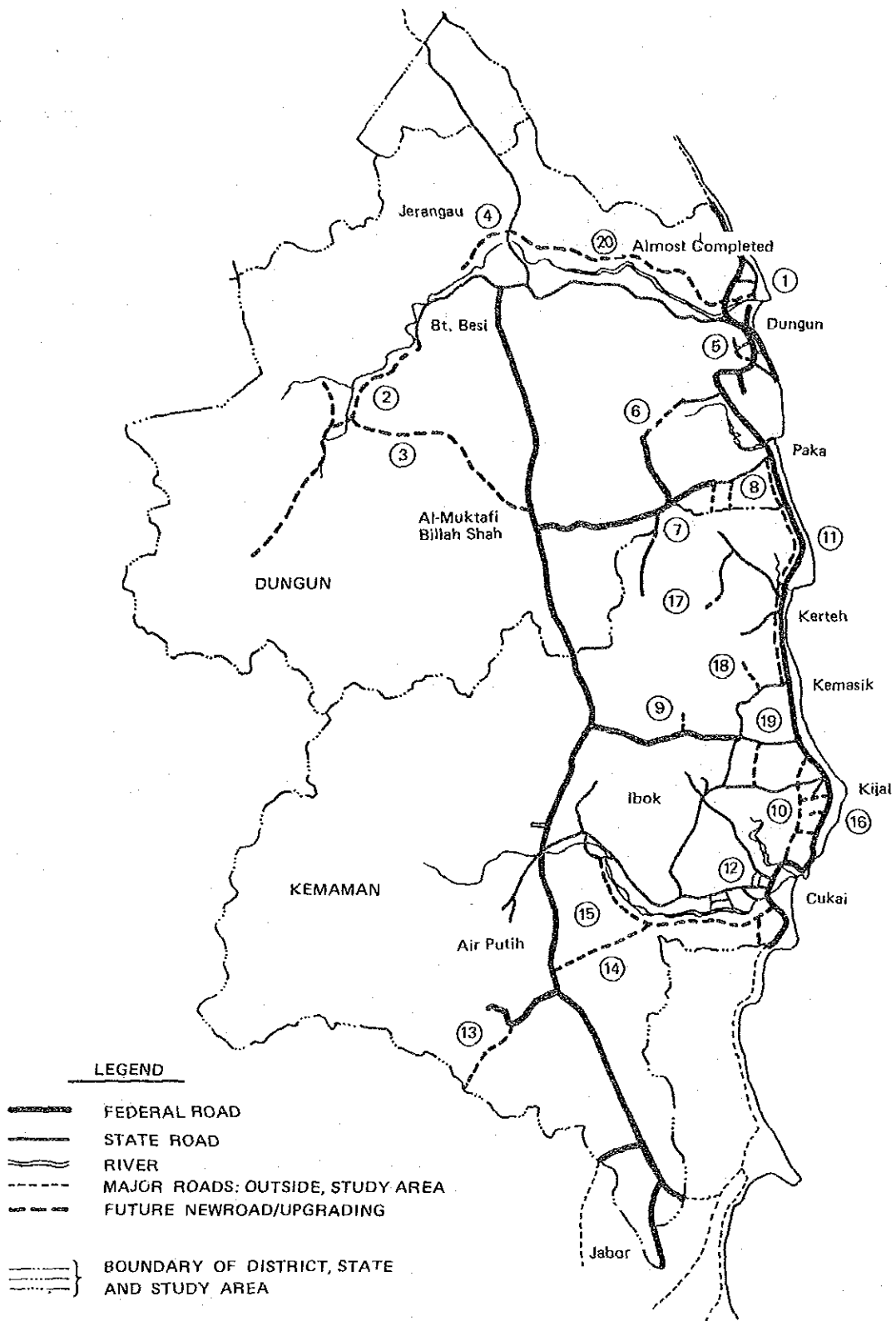


Fig. 8.6 FUTURE NEWROAD/UPGRADING PROJECT IN STUDY AREA

8.6.2 Public Transport Service

Problems:

Demand for bus service is relatively small and it is not attractive for bus companies to increase trip service and service lines.

- Trip frequency is not sufficient and irregular: e.g. they are operated at one hour interval during the day time between Dungun and Cukai. If this service level continues in this developing corridor, it will become a decisive deficiency for urban amenities.
- Operators will suffer from low profitability since the demand is not sufficient.
- Demand is not likely to increase as in the case of private car and motorcycle ownership. Increases in vehicle ownership usually reduce bus usage.

Increase in the ownership of cars and motorcycles is forecast to continue, which often leaves a problem of negligence of transport service for those who cannot use private transport means. They are the aged persons, housewives, children and poverty class families.

Recommendations:

1) Bus Service Network

There are three towns developing in the area, having a distance of 40 – 30 km between them; Dungun, Kerteh and Cukai. In order to have an efficient transportation system in the industrialized corridor, a high speed bus service is necessary, with some extending to the KETENGAH townships.

Within each town area, a network of bus services should be developed to provide an efficient public transportation system. The bus lines should be organized to cover an access service system to the newly planned railway stations in Cukai, Kerteh and Dungun.

- A region-wise network is proposed and shown in Fig. 8.7, where conceptually different levels of service are proposed.

2) Government Subsidy

Subsidizing a part of the cost is recommended since public buses are necessary to serve for those in the low income classes having no vehicles and those in rural areas where public services are not provided. Such investment and subsidies by the State Government will serve to sustain their mobility.

3) Studies to be Performed

Bus networks, frequencies, fare structure, operation system, amount of subsidy, etc. as well as transport demand should be examined at the earliest stage.

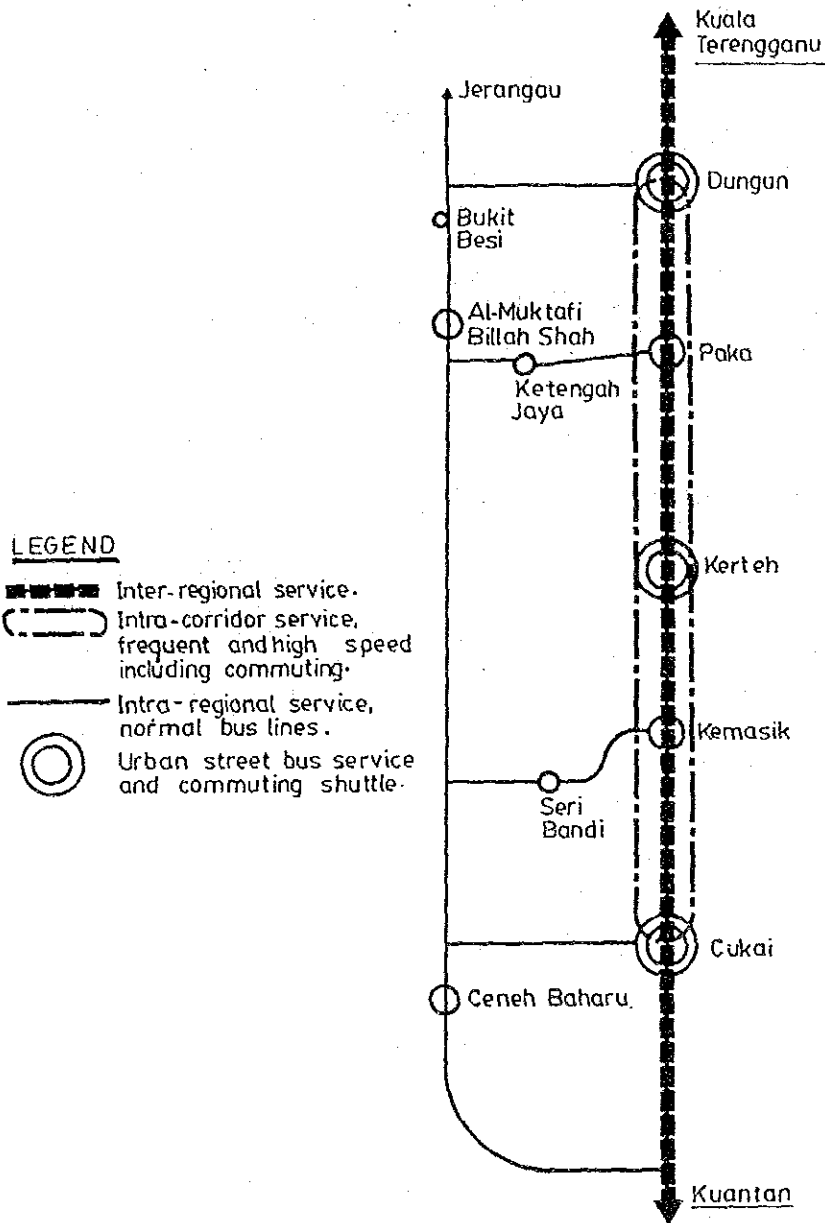


Fig. 8.7 CONCEPTUAL PATTERN OF BUS SERVICES

8.6.3 Airport and Port Facilities

The Terengganu airport was expanded to handle the B737 type jet aircraft while the Kerteh airport was constructed recently and is ready for the use of helicopters and small fixed-wing aircraft for the PETRONAS operation. In addition, a regular commercial flight service by the Malaysian Air Charter starts from March 1, 1985 with aircrafts of less than 36 seats for three or four round trips a day between Kerteh and Kuala Lumpur.

People in the study area also can use the services of Kuantan Airport. MAS will increase the number of flights when the demand increases. It is apparent there are no specific problems to be solved urgently.

Tanjong Berhara Port and Kuantan Port are ready to serve the demand for international and domestic marine transport. Their capacity is adequate, while the number of calls is relatively small. It is not expected that there will be any congestion created in the coming ten years or so.

8.6.4 Railways

The East-West Railway Line expected to go through the study area is now under examination by the Malaysian Government. However, the plan and programmes are not concrete enough to be incorporated in the sub-regional plan. Therefore, the railway plan and its impact on the Study Area are shown only conceptually.

A feasibility study has been undertaken by the Malayan Railway Authority and a JICA Study Team on the east-west lines passing through the area. The final results of the viability are due in late-1985. However, the Malaysian Government has decided a railway construction plan as follows (according to the letter of EPU on September 14, 1984):

1. The initial phase of implementation would connect Port Kelang == Kuala Lumpur == Janda Baik - Temerloh - Kuantan - Cukai - Paka
2. The implementations schedule is not yet decided.
3. A provisional alignment was discussed between the Malayan Railway (MRA) and the Terengganu State on which the feasibility study is being carried on.

The railway is proposed to run along the western side of Route III, with railway stations in Cukai, Kerteh, Paka and Dungun and a branch line to the Telok Kalong industrial estate. A cargo service station may be provided in the Kerteh industrial estate.

8.7 AGRICULTURAL DEVELOPMENT

8.7.1 Agriculture in KETENGAH

The Study Area consists of two parts, one is the KETENGAH area and the other is the coastal strip. The coastal region is composed of a narrow strip of bris soil swamp land and/or reserved forest zones. These regions are characterized by low fertility soils. But there remains development potential which can be realized by applying appropriate technology and suitable crops.

The KETENGAH area is calssified mainly into forest area and agricultural areas (Table 8.13). The forest areas are again delineated into the reserved and the yield concession forest. Accordingly, the area left for clutivation is determined so far as the main classification of the total KETENGAH area does not change.

Table 8.13 Landuse Plan of KETENGAH Area

LAND USE	AREA (ha)
Forestry	248,700
Agriculture	151,758
Human Settlement	9,738
Mining	486
Lake, River and Swamp	33,263
Ttoal	443,945

Source: KETENGAH

In the Study Area, centralized large scale estate system of tree crop production and small scale production by unorganized traditional farmers are in coexistence. In the case of tree crops, rubber trees are planted traditionally in both estate lands and small holdings, but oil palm and cocoa grown by small holders are just marginal. The majority of estates produce oil palm. There is no estate-like production system for fruits and other crops in the study area.

It is a basic understanding that KETENGAH has shown a substantial achievement in the past ten years, although there are some delays. Prospects and rising problems for the future are stated as follows.

An estimate of the production increase in the total of the existing and to-be-alienated estates shows a large increase by the year 2000 (Table 8.14).

Table 8.14 Total Production Increase of the Estate³⁾

	OIL PALM (FFB)		RUBBER (DRC)		COCOA (DCB)		TOTAL
	ha ¹⁾	mt ²⁾	ha	mt	ha	mt	ha
1983 (%)	49,880 (100)	529,200 (100)	4,830 (100)	3,790 (100)	660 (100)	231 (100)	55,360 (100)
1990 (%)	72,700 (146)	1,163,200 (220)	6,880 (142)	6,190 (163)	1,470 (223)	882 (382)	81,050 (146)
2000 (%)	88,000 (176)	1,551,000 (293)	8,800 (182)	10,343 (273)	3,440 (521)	2,380 (1030)	100,240 (181)

Source: Study Team

Notes: 1) Area in ha indicates the net planted area in production.

2) mt. : metric ton

3) Statistics for small holders are not available

In order to achieve the increase in this forecast, approximately 18,900 labourers are required in the year 2000 whilst there were 11,700 in 1983. It means that an additional 7,000 workers are required in 17 years. In order to fill in this requirement arising from tree maturity, policies to promote immigration should be pursued.

Problems:

The country as well as the coastal strip of the study area will move further into industrial development. It will generate more job opportunities which will be filled by a labour force, often from the agriculture sector, competing with the labour demand of agriculture.

The situation in which KETENGAH system is involved is no exception. It has to compete with industries and urbanization by not only keeping but also increasing the work force for the estate production system. Problems to be solved in association with the increasing demand for labour are classified as follows:

- To raise productivity
- To encourage and assist immigration
- To improve the living conditions in towns and settlements

Recommendations:

1) Increase in Productivity

In order to minimize the burden of labour shortage in the future, means to raise labour productivity should be investigated and implemented. These are

improvements in mobility by using small tractors, development, surfacing and maintenance of feeder roads, new equipment for cutting fruit and leaves, and others.

2) Encourage the Immigration of Workers

It is recommended to open the doors for settlement and job opportunities not only for Terengganu inhabitants but also to those from the other states to fill the future requirements of the estate system.

3) Ownership Participation

The FELDA type co-ownership and cooperative work system has a great advantage in finding and settling the workers in the developed land than other wage-payment system. Complicated legislative and administrative procedures are necessary to change other estates to the FELDA type of operation. The change may take a long time, however, it is an important measure to maintain the KETENGAH system. An approach to change over to this system should be explored.

4) Crop Diversification

To meet the increasing demands of the inhabitants of the developing coastal area, some of the new alienated agricultural land should be used for growing fruit and vegetables, while there will be similar efforts in improvement and conversion of the traditional farms for this purpose. At the beginning, a few lots of the new land should be selected for trial purposes to seek suitable planting.

8.7.2 Agriculture in Traditional Villages

Roughly 33,000 hectare of small holder's farms exist in the study area, and more than 20,000 hectares including the mixed planting are covered by rubber. The total area of fruit and coconut farm-yards around villager's houses is estimated to be next in size to the rubber planted areas.

The rice fields are scattered over the study area, but the total area is 1950 ha. in 1981, which is very small. They are often abandoned in the dry season. Upland foods crops such as maize, groundnut, potato and cassava are grown in a small scale for domestic consumption. Some vegetables and water-melon are cultivated for marketing purpose in a limited quantity. Also, cultivated areas of tobacco exist in the study area, however, these do not share a substantial part of the cultivated land of the study area. These are cultivated in the central and northern part of the State.

Labour force in traditional villages have inclined to work in estates and in urban areas, which results in cash incomes larger than their traditional production activities. The larger share of work outside their villages tends to neglect the opportunities to expand the production in the villages.

In order to protect the agriculture industry from deterioration and encourage more marketable products, it is considered that the strengthening of extension

service system is an important policy. Presentations in demonstration farms shall be covered in the system. Demonstration, together with persuasion and supports will motivate traditional farmers to engage in expanding the cultivation of lots by renting or buying unused and abandoned fields. Sub-section 8.7.3 Agriculture Research and Extension System summarizes the recommendations.

A marketing system of perishable products should be organized to sell their harvests at the right time for the greatest benefit. The farmers association should be extended to administer volume, destination, timing, and price negotiations on behalf of the participants.

The association and the wholesale market organized in urban areas will be able to control unfavourable behaviour of middle-men and transport operators who often exploit the individual producers by imposing high charges for their services. FAMA and other government agencies should initiate the development of this system.

8.7.3 Agricultural Research and Extension System

There are two MARDI research stations conducting researches in fruitcrops in hills and slopes in inland areas, and one tobacco research unit in the bris soil area. These stations can transfer technology to small farmers through the SDOA's extension service system. Considering the activities and locations of other MARDI stations, it is found not necessary to add a new research station in the study area. The existing stations and the MARDI system will be able to supply technology, suitable crops and other supporting service to encourage the agricultural production in traditional villages.

The following study subjects are recommended to be added to the activities of the research stations and the MARDI system.

- 1) Diseases of cashewnuts, cocoa, etc.
- 2) New varieties such as clove, seedless bread fruit (Sukun), spondial lutea liun, etc.
- 3) Vegetables and fruits.
 - Cabbage, tomato, and onion
 - Root crops, such as short term carrot and radish
 - Pepper, pumpkin, winged bean
 - Potato, chinese cabbage, cauliflower (inland high altitude area)
 - Specific variety to be cultivated in tobacco field when there is a break between crops for over 6 months
- 4) Utilization of oil palm sludge cake.

Possibility to use the dried oil palm sludge for livestock feed and fertilizer should be studied. In the northern part of the state, trials to use them for livestock feeding

has already started. If practicable, it can also be an agro-based industry in the KETENGAH area.

Currently, the extension service staff of DOA work in the field to perform technical service in traditional villages. Communications with MARDI stations and SDOA's extension service are already established. However, the coverage of farmers in this system is less than 60%, and it is considered necessary to expand the coverage in the inland area. The extension officers are also showing the cultivation through demonstration farm. In the coastal area, 77% of them in ha are located and in the inland area 23%. More locations of demonstration farms in the inland area are recommended. Volume 3 Study for Agriculture Research and Development contains the study in phase III period.

8.7.4 Forestry

The forest estates in the KETENGAH region falls into the following three categories:

Committed to the Integrated Timber Complex	121,480 ha
Permanent forest reserve	100,987
Royal Forest (Chenderong Concession)	26,305
<hr/>	
Total	248,700 ha

According to the basic forestry policy, "to harvest the forest resources conservatively by selective felling and retention of adequate regeneration, consistent with economic harvesting to ensure the sustainability of the forest resource base", logging is being carried out by Selective Management System (SMS). This permits, trunks of over 50 cm diameter at breast height (DBH) for dipterocarps and other species over 45 cm DBH are allowed to be harvested.

By the proper silvicultural treatment and management under a sustained-yield basis, a programme is set already that about 200,000 m³ of annual output of logs from the KETENGAH area would last to the end of this century, although there may be annual fluctuations caused by weather, topography of plots, etc. The target is low because the remaining area to be allocated for land clearing programme is considered as 10 – 15% of the planned 152,000 ha of the agriculture use in the KETENGAH.

Due to the prospect of reduced production levels in the coming years, some timber mills will have to be closed and employees in these mills will be discharged together with some loggers. It will be necessary to establish plans to encourage them to progressively change jobs to other sectors.

Action should be taken for reforestation by using selected species. Introduction and selection of fast growing species such as Yemane or Acacia mangium, should be started in the nurseries.

8.8 FISHERY

8.8.1 Marine Fishery

Present Situation and Problems:

The coastline of the study area is about 80 km long, and there were more than 3,000 registered fishermen in 1981. The annual average production for the years from 1978 to 1980 was 15,800 tons, and the per-capita allocation was 120 kg in the study area. It indicates that the marine fish is a surplus in this area compared to the annual per-capita consumption in Japan, No. 1 fish consuming nation in the world, of 52 kg followed by 33 kg in the Philippines.

The majority of fish landed in this area has no alternative but to be marketed either at the densely populated west coast and/or Singapore with the prices determined in these markets. The regional consuming population is very small.

The best way to obtain an optimum price for the fish products is to market them as fresh as possible. In the study area, however, most of fish are preserved by salting and drying or transported with crushed ice.

It would be realized that, to maximize profit, selected species must be sent to the best market where the best price can be obtained. Until the fish can be sold, care must be taken to maintain their freshness and condition.

The main problem for the marine fishery in the study area is the lack of well functioning systems in fishery and marketing.

Recommendations:

To obtain a larger profit from fish and to achieve a higher standard of living for fishermen, the following measures are recommended:

- 1) Fish should be kept as fresh as possible to obtain higher prices.

For this purpose, refrigerated storage and insulated trucks should be furnished or leased by the government to the Fishermen's Association for their effective storage and transport to the points of sale. Immediate action should be taken to increase refrigerated storage facilities.

- 2) Marketing of fish should be studied to maximize profit.

What to sell : The consumer's preference of the fish species should be identified as it influences the demand and price.

Where to sell : The market should be selected depending on what and when to sell, and the availability of transportation facilities.

Control of sales : Marketing of fish can be controlled through fishermen's cooperatives, and avoiding the over-supply of specific species.

- 3) Artificial fish sanctuaries in the sea-bed should be installed for experiments to maintain a steady re-production of fish. Whilst protecting fish from the intrusion of trawlers, setting of artificial sunken fish-shelters and floating shelters within 8 km distance from the shore-lines will be a great help to the indigenous fishermen. Installation and guidance of sunken fish-shelters and floating shelters should be supported by the government as a public service.

The preferable site conditions for fish sanctuaries are as follows:

- A site near a rocky cape where the terrain is covered by thick forests and has rocky beaches
- Sand beaches and sandy sea-beds close to a cape with the above topography
- An adjacent river mouth near the site of the above topography, is recommended provided that
- The current does not exceed one quarter knot per hour in view due to "hook and line" fishing methods

Among the study areas, sandy beaches stretching south of Kuala Dungun appears to satisfy the above conditions perfectly.

8.8.2 Brackish and Fresh Water Fishery

The fresh water fish ponds of Peninsular Malaysia total 2,247.73 ha., out of which 102.81 ha. is located in State Terengganu. No data of brackish water fish ponds are given by Annual Fisheries Statistics 1981 of Malaysia.

The most common species of brackish water aquaculture of the South-East Asia is milkfish (*Chanos chanos*), but it has never been recorded at Terengganu beach and rivers in the region. During the course of the current survey trips, quite a number of Mangrove Crab (*Scylla serrata*) and King Prawn (*Penaeus monodon*) were observed in volume in the markets.

Under tropical conditions, the best known species for fresh water aquaculture is *Telapia* (*Telapia Mazzanbia* and *Telapia nolotica*). However, there is no mention made in the Master Plan and Fisheries Annual Statistics 1981 about this species. In the course of making the survey, *Udang Galah* (giant fresh-water prawn, or *Macrobrachium rosenbergi*) was seen on several occasions in the local fish markets. This species is one of the species considered most promising for fresh water aquaculture.

There are quite a number of swamp areas left undeveloped in the study area. These swamp areas may be developed for several purposes, among which fishery or aquaculture can be considered beneficial for the local people.

A research station is recommended to be built and operated by the government to conduct necessary observation and works for development of aquaculture. If the results obtained at other fishery research centres of the country are readily available, it should be utilized in the swamps of this area.

8.9 TOURISM

8.9.1 General

The tourism facilities in Peninsular Malaysia are competing and supplementing with those in other ASEAN nations in attracting tourists. While in Peninsular Malaysia, the east coast is competing with the west coast and the study area is competing with the adjacent areas.

The tourist facilities in the study area are at an disadvantage when compared with the adjacent areas and/or the west coast. However, these disadvantages can be overcome by developing this subsector together with related infrastructures. Natural resources are sufficiently located in the study area. Major resources are shown in Fig. 8.8 and Table 8.15.

8.9.2 Natural Conservation

Firstly conservation policies should be adapted for reserved forest areas. Agricultural development and periodic floods have deteriorated the forest areas designated as conservation areas. Certain beaches with natural beauty should also be protected from urbanization and industrialization. The world famous turtle nesting and breeding site from Rantau Abang to Paka should be protected.

8.9.3 Recommendations

In order to raise the tourism sub-sector in the economy of the study area, the improvement of supporting infrastructure, particularly transport services, is necessary. Major points are shown below:

- The airport in Terengganu should be opened for international airline service similar to Kuantan Airport.
- Bus lines serving tourists should be provided and taxi service should be organized to a reliable level in terms of the rate of charges, waiting stations, monitoring of vehicle conditions, etc.

Inducing of Tourists:

Visitors should be invited through a number of market promotions and campaigns by SEDC, TDC organizations, hotels, tourist agencies, etc. Some suggestions are given as follows:

- Join hotel and tourist service systems such as the Mediterranean Club in Pahang State.
- Invite international and national conferences and conventions.
- Specific marketing to fill in the vacant season during the monsoon.

Hotels and Facilities:

Using the statistics of hotel guests of TDC, the forecast of the guests, demand for rooms in the study area was conducted. It resulted in an increase of 10% p.a. from

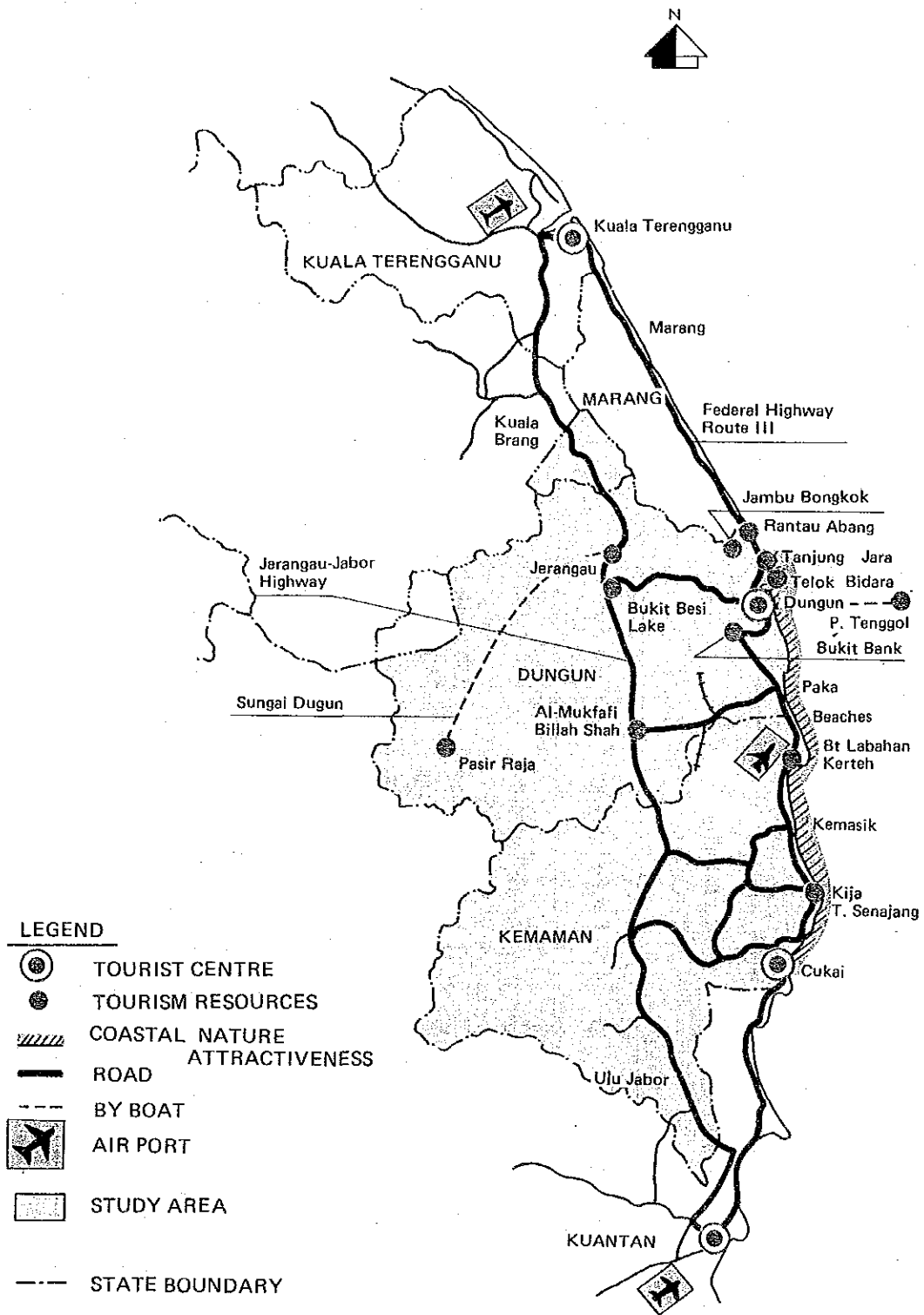


Fig. 8.8 TRANSPORT NETWORK AND TOURISM RESOURCES IN THE STUDY AREA

Table 8.15 Tourism Resources in the Study Area

Characteristic Point	Location	Hotel Rooms (not local)	Distances to the Nearby Urban Areas
Urban areas with tourist services	K. Dungun K. Cukai		
Turtles' nesting site	Rantau Abang	10 chalets	10 km to K. Dungun
Beaches	Tangjong Jara Telok Bidara Bukit Labohan Telok Senajang	100 rooms 250 rooms (proposed) 250 rooms (Proposed)	5 km to K. Dungun Very near to K. Dungun 35 km to K. Dungun 10 km to Cukai
Offshore islands	Pulau Tenggol		About 25 km to K. Dungun
Tropical forest reserves	Jambu Bongkok Bukit Bauk		
Rivers and lakes	Sungai Dungun (River Safari) Lake Bukit Besi		40 km (from Kg. Jerangau to K. Dungun) 30 km to K. Dungun

1980 to 2000. The forecast increase of demand for rooms is compared with the supply plans of hotel rooms as in the following table.

Table 8.16 Forecast of Hotel Rooms: Supply and Demand

	1983	1985	1990	1995	2000
Supply ^{1/}	400	479	1,029	1,329	1,629
Demand ^{2/}	330	448	623	835	1,230
Balance (1) – (2)	70	31	406	494	399
Occupancy ratio (%)	(82)	(94)	(61)	(63)	(76)

^{1/} By TDC as follows;

– Rantau Abang	Addition	50 rooms by 1985
– Tanjung Jara	Addition	50 rooms by 1990
– Hotel Muni	New construction	30 rooms by 1985
– Teluk Senajan	New construction	250 rooms by 1990
– Bt. Labohan	New construction	250 rooms by 1995
– Paka	New construction	200 rooms by 1990

^{2/} Study Team

It is considered that the supply programmes, which are mostly initiated by TDC and SEDC funding, will be able to meet the demand of visitors who come in the study area for tourism and business.

In the tourist development plans, suggestions of characteristics are:

- A chain system or location of hotel rooms, restaurants, shopping areas, sports and recreation areas.
- A combined development of these facilities and natural resources.
- Lower hotel room rates than quoted by other areas.
- Easy approach to local traditional village life, cultural variations, batik and handicrafts, etc.

Linkage with Tourist Excursion:

The tourism facilities and resources in the study area must not have detracting factors in absorbing tourists in competing with other resort areas. The concept of linking several tour points for excursions should be developed.

Study of Tourism:

As far as the plans of construction of hotels in the study area are concerned, they are located by different areas. No plans for a large scale resort area development project is prepared yet. This study considers at the moment this type of tourist development project should be studied from the viewpoint of the State or of the east coast.

9.1 SELECTED PROJECTS AND PROGRAMMES**9.1.1 Project Selection Procedure**

The Terengganu Master Plan Study (TMPS) has prepared an Action Plan and made recommendations on their selection in policies and projects extending to the year 2000 for the whole areas in the State of Terengganu.

This study has identified a list of projects giving their priority ranking in detail for the development of the South Terengganu sub-region.

In order to achieve the objectives laid down by the State, the strategies defined for the sub-region are as follows:

- 1) In order to diversify the economic structure and to accelerate industrialization in the Study Area, expand the role of the secondary sector and sustain ongoing plans in the primary sector (agriculture, forestry and fisheries);
- 2) Provide the requisite educational facilities and relocate human resources to support the new order of socio-economic structure;
- 3) Create core towns which will form the basis of a linear growth corridor;
- 4) Implement the infrastructure development to support all of the above items 1) thru 3).

In order to realize the work objectives envisaged, the projects and programmes proposed in the various sectors have been listed in the following sections. These projects have been analysed within the context of the TMPS. The projects which will form the basis of the development have been identified in the following Project/Programme List.

9.1.2 Selected Projects and Programmes

Primary Industries:

– Agriculture Research and Development System

Establish an agricultural research and extension system which investigates methods for development of techniques to modernize the traditional agriculture and assist in raising productivity of farmers.

- Promote Retraining and Relocation of Excess Workers
Consists of relocating part of workers in the traditional sector to other sectors by providing vocational retraining.
- Establish Fisheries Research Station
The establishment of the station or introduction of technology developed by the Federal system will allow for new techniques needed to develop modern fishing methods and the application thereof.

Secondary Industries:

- Study Incentives and Subsidies to Induce Industries
Study methods to induce manufacturing industries by incentives and subsidies to form a growth pole.
- Formulate Petrochemical Industrial Complex
Plan the downstream complexes of oil and gas refineries.
- Plan Steel Related Industrial Complex
Plan steel related industries and plants.

Urban Development:

- Develop Structure Plan for Dungun and Cukai
Study methods for urban development for Dungun and Cukai and prepare programmes for development of commercial, residential and industrial areas.
- Urban Land Supply
Study methods of developing land for urban uses and land readjustment for the restructure of land use, including construction of roads and drainage and sewerage networks.
- Induce Establishment of Educational Institutions and R & D Facilities
Find method to induce educational facilities, vocational training facilities and R & D Institutes.

Transportation:

- Dungun By-Pass
Study a by-pass plan which will keep the through-traffic out of the urban area of Dungun and coordinate the by-pass with the railway plan, drainage programmes and the land use plan.
- Cukai By-Pass
Prepare a by-pass to keep the through-traffic out of the central town area of Cukai and coordinate the by-pass with the urban development, industrial estate construction, flood mitigation plans and the railway plan.

– Upgrading of Road Networks

A road network which will form the backbone of the sub-regional transportation system shall be planned with a suitable right-of-way and designed to be flood free.

– Public Transportation

A system of bus networks shall be planned to provide transportation between the core towns, with the KETENGAH area, and within the town thereby.

Flood Control and Drainage:

– Dungun Town Area Drainage

The developing Dungun urban area shall be planned to be flood-free, and the drainage system shall be designed and coordinated with the by-pass road system and land supply programme.

– Cukai Town Area Drainage

The developing Cukai urban area shall be planned to be flood-free, and the drainage systems shall be designed and coordinated with the land supply programme and the by-pass road system.

– Overall River Basins Drainage Plan

The overall river basin management from the upper reaches to the lower extremes to include projects and programmes for water intake, water control, levee protection and bar formation at the river mouth, etc.

Implementation Organization:

– Organize Growth Corridor Development Committee

Set up an agency to monitor development projects to include planning, implementation and coordination.

9.1.3 Project Schedule

The projects identified above have been given in Table 9.1 showing the period of time for their implementation.

The basic concept has been to establish an industrial growth pole up to the year 1995 which will become the nucleus of a 'growth corridor', while sustaining the development of primary sectors in the KETENGAH area. The growth pole should be developed to a substantial scale which can have spill over effects in the adjacent areas including the towns of KETENGAH.

9.2 Priority Projects/Programmes

The projects which are recommended as contributing to the formation of the "growth corridor" and other sectoral development have been selected and described.

All the projects listed in Table 9.1 have a high degree of priority and require urgent implementation, however, there are matters of highly political and administrative nature which must be considered or require basic investigation before work can be started together with their performance times.

The projects were analyzed by a screening process and the ones below are selected and recommended as possessing the high degree of urgency in the overall development of the Study Area. These projects are also endorsed as being desirable for the next step of feasibility studies.

- Petrochemical Complex
- Urban Land Supply
- Dungun By-pass Road
- Cukai By-pass Road
- Public Transportation Improvement Studies
- Dungun Town Area Drainage Improvements
- Cukai Town Area Drainage Improvements

The projects and programmes that were eliminated in the screening process were made in the following three classifications and the reasons given.

- 1) Projects that are being formulated and have duplicating features with other programmes.

- Agriculture Research and Development System

There are federal agencies performing research in this field and are capable of carrying on their work. MARDI is a good example. Proposal to establish a new organization in addition to the existing research systems should be checked to avoid duplication.

- Promote Relocation of part of the Workers in the Traditional Sectors

There are training centres performing training programmes, and work is progressing to solving this problem. Their programmes should be reinforced.

- Fishery Research Station

There are federal programmes currently in progress to reinforce the off-shore marine fishing together with aquaculture programmes. Artificial shelter experiment should be covered under these programmes.

- Steel Complex

Studies for an integrated steel complex is being performed by HICOM.

- Structural Plan for Dungun and Cukai

It is planned by SEPU (State Economic Planning Unit) and Town and Country Planning Department to perform this work.

An exception has been made in the case of the Petrochemical Complex at the request of SEPU, even though there have been studies already prepared.

- 2) Projects that will be undertaken by the Federal and State and involve legislative action.

- Study to Provide Incentives and Subsidies

- Establishing and organizing Educational Institution, Vocational Schools and R & D Centres (includes establishing of a University at Dungun)

- Organizing of "Growth Corridor" Development Committee

- 3) Project that will require basic investigations and studies, intensive surveys which are of large scale in nature and require a long time and cost to perform.

- Overall River Basins Drainage Plan

- Upgrading Road Network

There are plans for upgrading road networks and these can be followed, but there will have to be coordination with the Overall River Basins Drainage Plan to render the roads free from floods.

Table 9.1 Selected Project and Programme

SECTOR	UP TO 1985	1986 - 1990	1991 - 1995	1996 - 2000 AND BEYOND	REMARKS
Agricultural Research and Development System	Study on required functions, facilities and programmes	Research and Development together with extension service	Continue R&D and extension service	Continue R&D and extension service	A study in Phase III is shown in Volume 3
Assist Relocation of Part of Workers in Traditional Sectors to Other Sectors	Study and preparation training and promotion programme	Continue programme	Continue programme	Continue programme	Applicable to those who decide to change the work and/or move to urban areas
Fishery Research Station	Study of required facilities and programme and preparation work	Coastal fisheries and freshwater fisheries R&D extension work for fishermen	Continue programme	Continue programme	If the federal centres can supply necessary information, or information supply channel and action plans should be established
Study on Incentives and Subsidies	Study on incentives and subsidies	Execution of programme	Review programme and accelerate diversification	Continue programme	Allocation of funds for subsidies should be brought to legislative authorization
Petrochemical Complex	Continue study on complex project	Determine and construct a complex	Develop petrochemical downstream industries	Continue expansion and diversification	The result of prefeasibility study in Volume 4
Steel Complex	Continue existing programme	Develop steel related industries	Continue development	Continue development	An integrated steel complex is under study by HICOM
Structure Plan for Dungun and Cukai	Formation of structural plan and gazetting the plan	Project implementation in accordance with the plan	Continue development	Continue development	

Table 9.1 Selected Project and Programme (Cont'd)

SECTOR	UP TO 1985	1986 - 1990	1991 - 1995	1996 - 2000 AND BEYOND	REMARKS
Urban Land Supply	Study the land readjustment and legislation therefore	Execution of project	Continue development	Continue development	Coordination with Federal Government Agencies
	Study on swamp reclamation and rehabilitation in coordination with flood mitigation Programme	Large scale execution of housing development	Continue development	Continue development	
Invite and Organize Educational Institutions, Vocational Schools and R&D Institutions	Promotion of locations of higher educational institutions and organizations to Dungun	Organizing Technical Training College and Vocational Training Institutes	Establish Science and Technology University	Upgrade the functions of Institutes	Negotiation with Federal Government and related organizations
	Engineering study in coordination with urban land supply programme and initiate drainage programme	Construction of the by-pass road	Coordination with up-graded Route III	Upgrading the geometric feature (2L - 4L) of roads	
Dungun By-pass Road					
Cukai By-pass Road	Engineering study in coordination with urban and industrial land development and drainage programme	Construction of by-pass road	Coordination with up-graded Route III	Upgrading and extension of by-pass road sections (2L - 4L)	
Upgrading Road Network	Study on flood free road	Improvement of Route III	Improvement of feeder road	Upgrading Route III	Overall river basin drainage plan should be coordinated with geometric design and bridge and culverts
	Continue existing programme	Land acquisition for regional feeder road	Continue in development	Overall road network and traffic control devices improvement	
		Urban road network improvement			

Table 9.1 Selected Project and Programme (Cont'd)

SECTOR	UP TO 1985	1986 - 1990	1991 - 1995	1996 - 2000 AND BEYOND	REMARKS
Public Transportation	Study on public transportation system in the sub-region especially along the "Growth Corridor"	Subsidize or organize a state owned public transport company to increase the service frequency and route coverage	Continue to intensify the service	Reappraise the public transportation system	
Dungun Town Area Drainage	Study on town area drainage plan in coordination with present development progress and land supply programme Review Dungun drainage master plan	Implementation of the programme together with land supply and by-pass road construction	Continue development	Improvement and reconstruction of drainage system in connection with overall drainage plan and sewerage plan	Overall river basin drainage plan should be coordinated with the urban area drainage plan
Cukai Town Area Drainage	Study on town area drainage plan in coordination with present development progress and land supply	Implementation of the programme together with land supply and by-pass road construction	Continue development	Improvement and reconstruction of drainage system in connection with overall drainage plan and sewerage plan	The result of prefeasibility study in Volume 2
Overall River Basin Drainage Plan	Formation of study and survey programme Fundamental study and data correction Preliminary study on Dungun and Kemaman river basin	Master plan study of the river basins Engineering study of urgent project Implementation of the urgent programme Coordination with other development projects related to drainage	Continue development Study and investigation	Continue development Implementation	Lack of fundamental survey on the river basin is the most significant constraints to proceed with the programme Minimum required data: a. Topo map - 1:5000-10000 b. Hydrological data in the designated river basin c. Cross-sectional survey along the river d. Geological data
Organizing "Growth Corridor" Development Committee	Set up Growth Corridor Development Committee	Coordination and integration of the project and programmes in the "Growth Corridor"	Continue activities	Continue activities Expand the functions to the sub-regional level	

9.3 Selected Themes for Pre-feasibility Studies

After the discussion of the Draft Final Report, which was submitted in September 1984, the Government of Malaysia requested that prefeasibility level studies be conducted for the following themes in a letter to the Embassy of Japan dated October 29, 1984.

- 1) Cukai Town Drainage Development
- 2) Study on the Provision of Incentives and Subsidies in Industrial Sectors
- 3) Agricultural Research and Development
- 4) Petrochemical Complex

The request was received and the outline study plans by the JICA Study Team were presented for discussion at the meetings of the Technical Committee and Steering Committee in February 1985. With the concurrence of the meetings, the studies were conducted in Phase III for the months of February-May, 1985. The results of the prefeasibility studies of 1), 3) and 4) are edited in separate volumes.

In the case of 2) Incentives and Subsidies, the outcome of the study is incorporated in Chapter 4 Industrial Development, Technical Papers I (Volume 5).

APPENDIX

APPENDIX 1 THE STEERING COMMITTEE OF THE GOVERNMENT OF MALAYSIA

Dr. Nik Ibrahim B. Nik Mahmood
Economic Planning Unit

Mr. Alihan b. Hj. Abdul Hamid
Economic Planning Unit

Mr. Anish Kumar Roy
Ministry of Land and Regional Development

Mr. Ong Hong Fong
Town and Country Planning Department

Mr. Lee Chock Seng
Drainage and Irrigation Department

Mr. Low Kee Yang
Public Works Department

Mr. Zainal Abidin Mahmud
Heavy Industries of Malaysia Berhad (HICOM)

Mr. George Chan
National Petroleum Berhad (PETRONAS)

Ministry of Agriculture

Malaysia Industrial Development Authority (MIDA)

APPENDIX 2 THE TECHNICAL COMMITTEE OF THE GOVERNMENT OF MALAYSIA

Dato Mazlan bin Hashim
Tim. Setiausaha Kerajaan (Pembangunan)
Terengganu — Chairman

Encik Mamat bin Abdullah
Tim. Pengarah Unit Perancang Ekonomi Negeri
Terengganu

Encik Salleh bin Hj. Mohd
Lembaga Kemajuan Terengganu Tengah.

Encik Mohd bin Ngah
Wakil Pegawai Kewangan Negeri Terengganu

Encik Ismail bin Alias
Wakil Pegawai Kemajuan Negeri.

Encik Jamilus bin Hussein
Pengarah Kerja Raya Negeri.

Encik Loo Kee Watt
Jabatan Kerja Raya Negeri (Jalan)

Encik Boh Min Hai
Pengarah Bekalan Air Negeri

Encik Martin Dorai
Pengarah Parit dan Talian Negeri.

Encik Hassan Basery Hamzah
Pengarah Perancang Bandar dan Desa Negeri

Encik A. Rahman Che Ali
Wakil Pemungut Hasil Tanah Dungun

YM. Syed Ahmad bin Syed Kassim
Tim. YDP Majlis Daerah Kemaman

Encik Abd. Rahman bin Mohd Yusoff
Perbadanan Memajukan Iktisad Negeri Terengganu

YM. Sheik Muhamed bin Sheik Hussain
Lembaga Letrik Negara

Encik Shafie Abd. Rahman
Petronas Terengganu.

Encik Ab. Halim Ab. Hamid
Pegawai Penyelidik Mardi Terengganu

Encik Mokhtar bin Embong
Pejabat FAMA Negeri.

Encik Shamsudin Hj. Ab. Latif
Peg. Kawalan Alam Sekitar Wilayah Timur Laut.

Tuon Haji Alias bin Mohamed
Unit Perancang Ekonomi Negeri.

YM. Tengku Hassan bin Omar
Unit Perancang Ekonomi Negeri

Encik Muhatar bin Abdullah
Unit Perancang Ekonomi Negeri

Encik Mohd Akib bin Ismail
Unit Perancang Ekonomi Negeri.

– Secretary

APPENDIX 3 THE SUPERVISORY COMMITTEE OF THE JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

- Noboru TABE : Chairman
Executive Director, Institute of Developing
Economies
- Michiro NAKAMURA : Industrial Relocation Department,
The Regional Development Corporation
- Unosuke UEMATSU : Agricultural Structure Improvement Bureau,
Ministry of Agriculture, Forestry and Fishery
- Noriyoshi SHINTO : Economic Affairs Bureau, Ministry of Construction
- Jun MATSUSHITA : Urban Development Department, Housing and
Urban Development Corporation
- Yoshiyuki KITANO : Regional Transport Bureau, Ministry of Transport

APPENDIX 4 JICA'S STUDY TEAM

Teruhiko HORIE	:	Team Leader
Minoru SHIBUYA	:	Project Assessment
Hayao TESHIMA	:	Industries
Jiro OHNO	:	Industries
Tadashi USHIJIMA	:	Industries
Masaaki SHIRAIISHI	:	Petrochemical Complex
Tadao NOMURA	:	Petrochemical Complex
Akio MISONOU	:	Petrochemical Complex
Hironu OKAZOE	:	Steel Industry
Hideki TAKAHASHI	:	Manpower and Tourism
Kotaro NAGAI	:	Agriculture
Michiaki HOSONO	:	Agriculture
Isamu WATANABE	:	Fishery
Yoshinobu NOMURA	:	Regional Planning
Tadashi KUME	:	Urban Planning
Yoshitaka FUKUDA	:	Urban Planning
Hiroyuki SHIRAIWA	:	River Planning
Osamu YAMAMOTO	:	Urban Drainage
Akihiko HIROTANI	:	Transportation
Masashi HATTORI	:	Environment
Toshiki NAITO	:	Economy
Akihisa KOJIMA	:	Economic Assessment

APPENDIX 5 SCOPE OF WORK

SCOPE OF WORK
FOR
MASTER PLAN STUDY
ON
THE INTEGRATED REGIONAL DEVELOPMENT
OF
SOUTH TRENGGANU

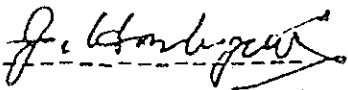
AGREED BETWEEN

THE GOVERNMENT OF MALAYSIA

AND

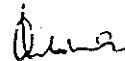
JAPAN INTERNATIONAL COOPERATION AGENCY

19TH APRIL, 1982



(MR. JIRO HASHIGUCHI)
Leader of the Japanese
Preliminary Survey Team

on behalf of
JAPAN INTERNATIONAL
COOPERATION AGENCY



(TAN SRI ISHAK BIN PATEH AKHIR)
DIRECTOR GENERAL
Economic Planning Unit
Prime Minister's Department
on behalf of
THE GOVERNMENT OF MALAYSIA

- I. Introduction
- II. Background of the Study
- III. Objectives of the Study
- IV. Study Area
- V. Scope of the Study
- VI. Reports
- VII. Institutional Framework
- VIII. Tentative Study Schedule
- IX. Undertakings of the Government of Malaysia
- X. Undertakings of the Government of Japan

I. Introduction

In response to the request made by the Government of Malaysia on 17th April 1981, the Government of Japan decided to extend technical cooperation to conduct the Master Plan Study on the Integrated Regional Development of South Trengganu (hereinafter referred to as the Study) through the Japan International Cooperation Agency (hereinafter referred to as JICA) in accordance with laws and regulations in force in Japan.

JICA, the governmental organization responsible for the implementation of official technical cooperation programmes of the Government of Japan, will execute the Study in close cooperation with the Government of Malaysia.

In January 1982, the Government of Japan sent a contact team headed by Mr. Katsuhiko ICHIOKA, Director of Planning Department of JICA, in order to acquire further knowledge on the background of the request. After the contact team held a series of discussions with officials of the Government of Malaysia, both sides reached a mutual understanding on several matters concerning the Study and these are contained in the signed Minutes of Discussion of 5th February 1982.

According to the understanding of the Minutes of Discussion, JICA sent a preliminary survey team (hereinafter referred to as the Team) headed by Mr. Jiro HASHIGUCHI, Head of the Regional Study and Coordination Division, Planning Department of JICA in April 1982 to discuss the content of the Study in detail with the Economic Planning Unit (hereinafter referred to as EPU) and other authorities concerned of the Government of Malaysia. The final meeting was held

on 19th April 1982 and both sides agreed to the Scope of Work.

The present document sets forth the Scope of Work for the Study.

II. Background of the Study

The Government of Malaysia has promoted its socio-economic development based on New Economic Policy (NEP) since 1971. The objective of the NEP is to achieve national unity through eradication of poverty and restructure of society so as to reduce the economic imbalances.

The agricultural and forestry development being carried out by the Lembaga Kemajuan Trengganu Tengah (hereinafter referred to as KETENGAH) in South Trengganu since 1973 is in the course of accomplishing the objective of the NEP.

The discovery of oil and natural gas in 1978 at the under sea points of the 200 Km offshore from the Trengganu coast has greatly changed the circumstances of development in the South Trengganu region.

While Federal and the State Governments have plans to develop petro-chemical and steel industries in the coastal area, they also predicted that the industrial development will induce various socio-economic impacts on the inland area where KETENGAH engages in agricultural and forestry development. Harmonious development of coastal and inland area in South Trengganu therefore became indispensable, and a study on the integrated regional development was requested to the Government of Japan.

In response to the Malaysian request, the Government of Japan decided to execute a master plan study on the integrated regional development of South Trengganu which aims at contributing to harmonious development in the region.

III. Objectives of the Study

Consistent with the growth and distribution policy of the Government of Malaysia, the objectives of the Study are:

- to prepare a master plan for the integrated and balanced socio-economic and physical development of the South Trengganu region as a whole, taking into account the existing Plans and Programmes; and
- to identify, within the context of the master plan, priority projects and to provide appropriate proposals for the implementation of those projects.

IV. Study Area

The Study covers the whole region of the southern part of the State of Trengganu, consisting of:

1. the coastal strip in the Districts of Dungun and Kemaman; and
2. the KETENGAH region.

V. Scope of the Study

The Study intends to prepare a master plan on the integrated regional development of South Trengganu and to present recommendations for the implementation. In the Study, emphasis will be put on the identification of recent bottlenecks and other constraints for development, and the finding of the means for solutions and development possibilities.

The target year of the Study is the year 2000.

Since early completion of the Study is imperative, full utilization of existing and available information, data and other relevant materials is prerequisite for the Study.

The Study will concentrate on matters in the Study area unless otherwise specified, but it may refer to general natural conditions and socio-economic situation in Malaysia and the State of Trengganu if necessary.

1. General

In the following survey subjects, general natural conditions and socio-economic situation in the Study area will be studied to acquire basic information, data and useful reference for sectoral development.

- (1) basic natural conditions on climate, land, water, natural resources including energy resources in the Study area
- (2) present regional socio-economic situation of the State of Trengganu and the Study area
- (3) past development surveys and present development plans in the Study area
- (4) major past and present development activities by foreign governments and private institutions.

2. Review of the Present Conditions for Development

The present situation of sectoral development in agriculture, forestry, fisheries, mining, industry, other industrial activities and social infrastructure will be

analysed in the following survey subjects. Then, current bottlenecks and constraints for development will be identified.

2-1 Agriculture, forestry and fisheries

- (1) physical conditions (topography, geology, soil, climate and water)
- (2) resource availability (land, water, forestry and fishery resources) and agricultural infrastructure
- (3) agriculture, forestry, fisheries, aquaculture and livestock activities.
- (4) promotion policies and institutions.

2-2 Mining and industry

- (1) reserve of mineral resources (petroleum, natural gas and non-metals such as silicic sand, granite and clay)
- (2) mining and industrial development projects and activities
- (3) promotion policies and institutions

2-3 Social infrastructure

- (1) transportation
- (2) public utilities and energy
- (3) urban development
- (4) land conservation
- (5) tourism
- (6) manpower

(7) social amenities

3. Examination on Sectoral Development Possibilities

The development possibilities on sectoral basis will be examined from technical and economic point of view in the following survey subjects. Analysis on development needs, capability, constraints and impacts will be also sufficiently included.

3-1 Agriculture, forestry and fisheries

The development possibilities based on the survey results of 1. and 2-1. will be examined in the following survey subjects in order to improve income level and living conditions of the existing villagers in the depressed area through improvement of productivity, introduction of new crops and product processing.

- (1) agricultural development
- (2) forestry development and reforestation
- (3) fishery development
- (4) livestock development

3-2 Mining and industry

The development possibilities based on the survey results of 1. and 2-2. will be examined in the following survey subjects, understanding the present situation of resource-based industries in the Study area.

- (1) resource-based industries (steel, methanol, ammonia, ethylene and polyethylene)

- (2) secondary wood processing industry
- (3) down-stream industries related to petroleum, natural gas, steel, palm oil and other agricultural products
- (4) other industries (non-resource based and supporting services),

4. Examination on Social Infrastructure for Development

Requirements for future social infrastructure will be examined in the following survey subjects. An assessment on future socio-economic conditions reflecting the survey results of 1.2.3. is necessary for the assumption of the above mentioned examination.

- (1) projection on future socio-economic and industrial conditions.
 - a) population and work force
 - b) production quantity
 - c) others
- (2) future transportation needs
 - a) person and cargo transport
 - b) roads
 - c) air and sea ports
 - d) railways
- (3) public utilities and energy
 - a) electricity
 - b) water supply
 - c) gas
 - d) telecommunications

- (4) urban structure plan (zoning) for Dungun and Chukai, and township development in other main growth points.
- (5) land conservation
 - a) river mouth sedimentation in Sg. Dungun, Sg. Paka and Sq. Kemaman
 - b) beach erosion near Dungun
- (6) tourism potentials
- (7) basic plan for a possible industrial training institute
- (8) social amenities (facilities for education, health, housing, and community service)

5. Preparation of an Integrated Regional Development Plan

Based on the survey results of 1.2.3. and 4., sectoral development plans will be established. Then, by integrating them, an integrated regional development plan will be formulated with the priority projects identified. Whenever and wherever socio-economic development is envisaged, environmental point of view should be kept in mind.

- (1) formulation of sectoral development plans
 - a) strategy (socio-economic and physical)
 - b) identification of potential projects
 - c) possible socio-economic impacts
- (2) formulation of social infrastructure plans taking account of (1)
- (3) coordination and integration of sectoral development plans and social infrastructure plans
- (4) identification of possible priority projects.

6. Implementation and Investment Plans

The following subjects will be studied for the above mentioned integrated regional development plan.

- (1) preliminary cost estimates for priority projects
- (2) implementation schedule of priority projects.

VI. Reports

JICA will prepare and present the following reports in English to the Government of Malaysia in the course of the Study.

1. Inception Report
 - . 70 copies
 - . at the commencement of the Study
2. Progress Report
 - . 70 copies
 - . in the course of field survey in Malaysia
3. Interim Report
 - . 70 copies
 - . at the end of field survey in Malaysia
 - . The Government of Malaysia will provide JICA with its comments within one month after receipt of the Interim Report
4. Draft Final Report
 - . 70 copies
 - . at the end of work in Japan
 - . The Government of Malaysia will provide JICA with its comments within two months after receipt of the Draft Final Report
5. Final Report
 - . 130 copies
 - . within three months after receipt of the comments on the Draft Final Report

All reports when finalized and submitted to the Government of Malaysia shall remain the property of the Government of Malaysia.

VII. Institutional Framework

For the Malaysian side, the Economic Planning Unit (EPU) will serve as the agency responsible for the coordination of the Study.

The Malaysian side will establish a Steering Committee and a Technical Committee comprising the authorities concerned including the representatives of The Trengganu State Government and KETENGAH.

For the Japanese side, JICA is the organ responsible for the execution of the Study.

VIII. Tentative Study Schedule

The whole work will be conducted in accordance with the attached tentative study schedule.

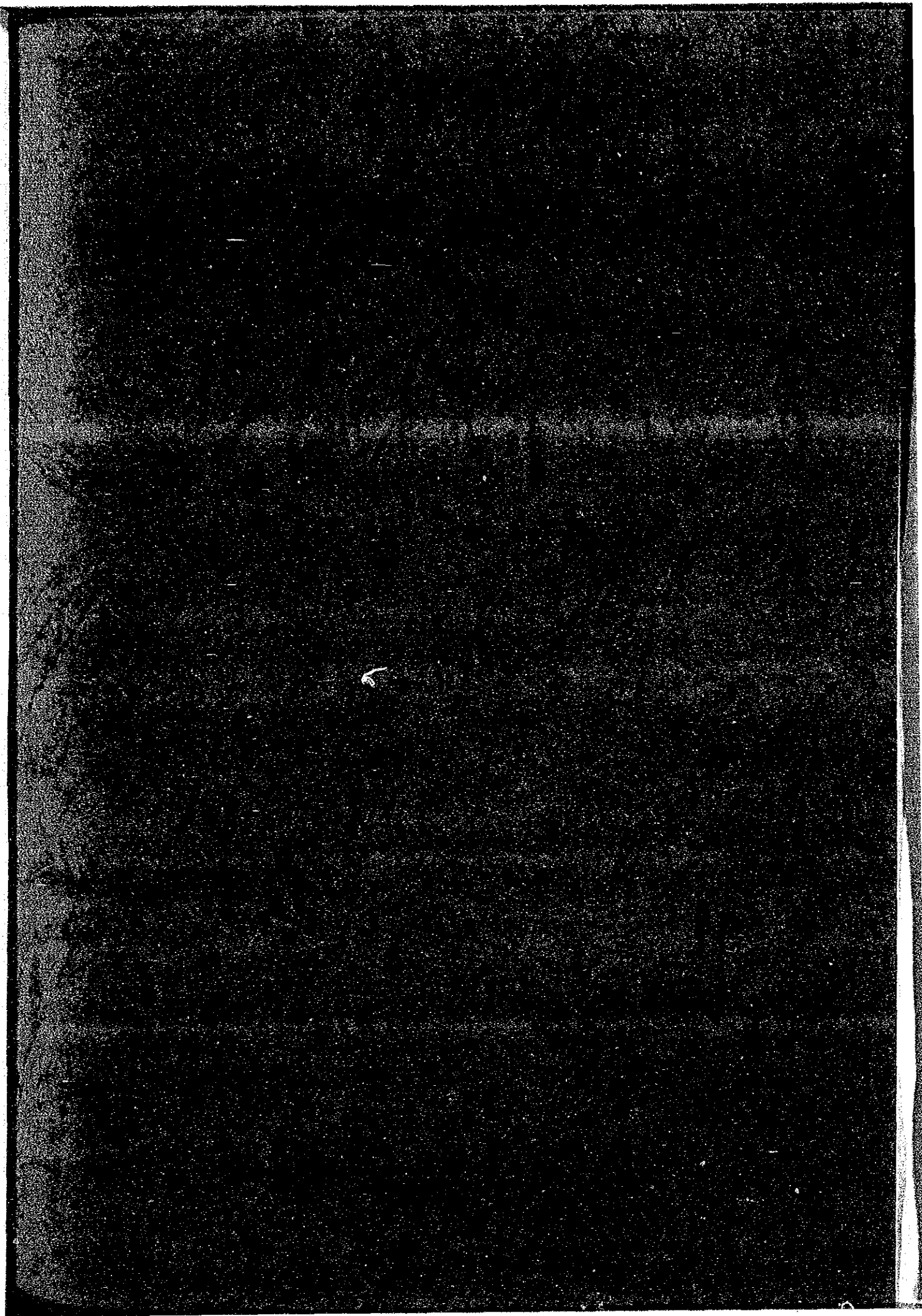
IX. Undertakings of the Government of Malaysia

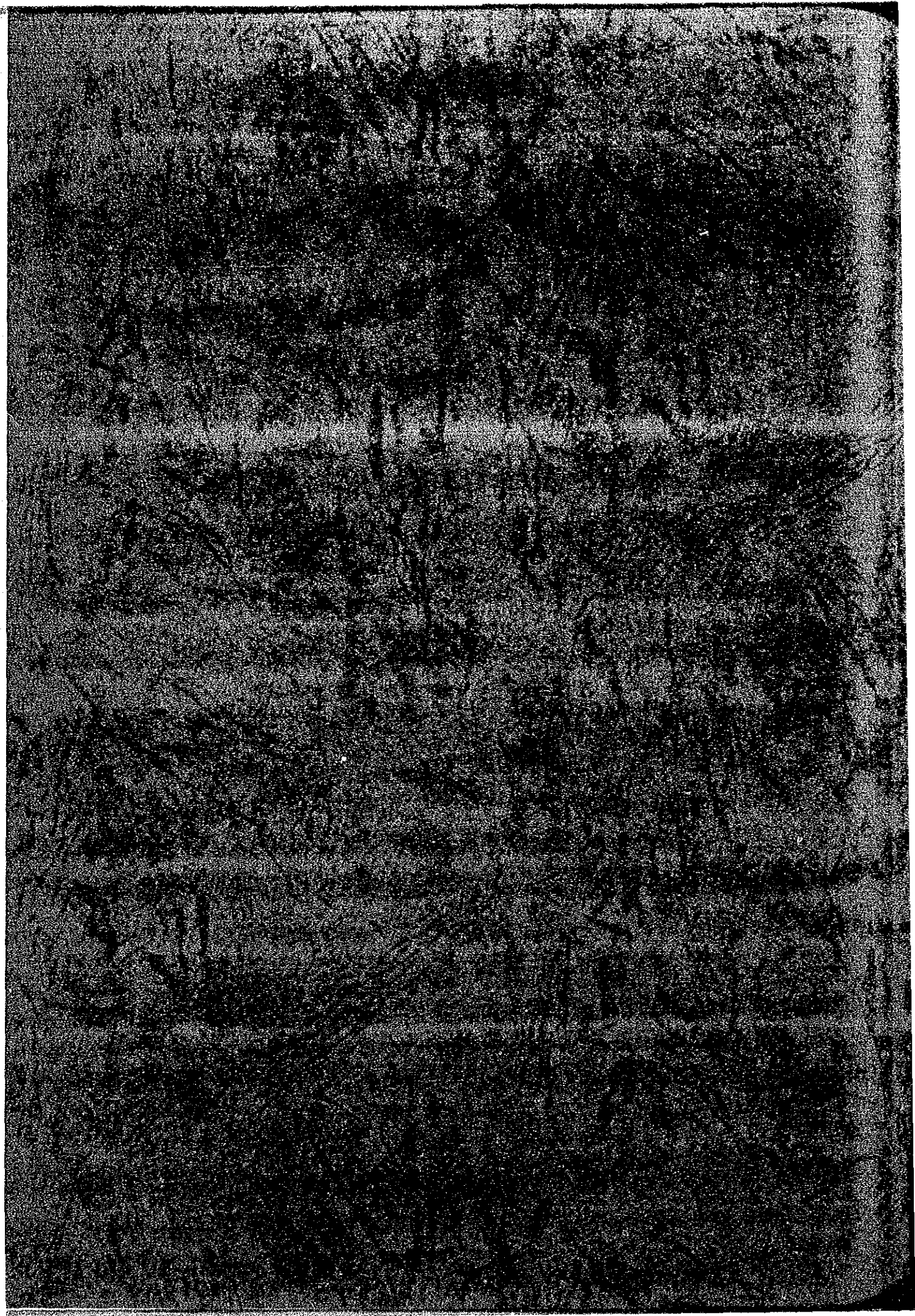
1. To provide the Study Team with available relevant data and information necessary for the execution of the Study.
2. To exempt the Study Team from taxes and duties normally accorded under the provision of General Circular No.1 of 1979 for materials, equipment and personal effects brought into Malaysia for the purpose of the Study.
3. To appoint counterpart personnel to the Study Team during the Study period.
4. To provide the Study Team with suitable office space, necessary office equipment and secretarial services for the Study.

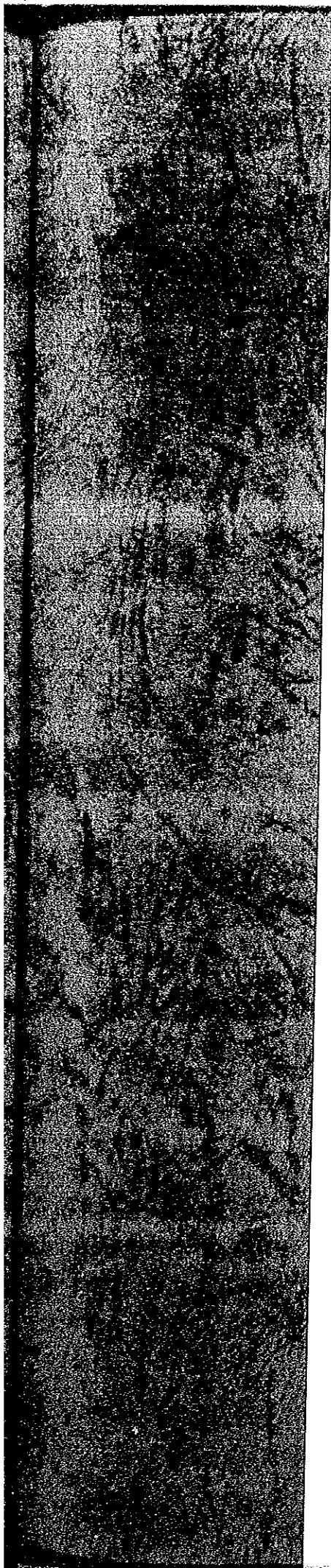
5. To make arrangements for the Study Team to rent suitable furnished residence and to hire vehicles with drivers during the Study period.
6. To make arrangements for the Study Team to take back to Japan the data, maps and materials connected with the Study subject to the approval by the Government of Malaysia in order to prepare the Reports.
7. To secure the necessary entry permits for the Study Team to conduct field surveys.
8. To inform the members of the Study Team of any existing risk in the Study area and take any measure deemed necessary to secure the safety of the members of the Study Team.
9. To indemnify any member of the Study Team in respect of damages arising from any legal action against him in relation to any act performed or omissions made in undertaking the survey except when the two Governments agree that such a member is guilty of gross negligence or wilfull misconduct.

X. Undertakings of the Government of Japan

1. To send Study Teams in relevant fields to execute the Study.
2. To bear travelling expenses and fares between Japan and Malaysia and also within Malaysia for members of the Study Team.
3. To meet the cost of accommodation and living expenses for members of the Study Team during their visits to Malaysia.
4. To perform technology transfer to Malaysian counterpart personnel in the course of the Study.
5. To arrange training courses in Japan for Malaysian counterparts and bear travelling and living expenses in Japan.







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