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THE GOVERNMENT OF MALAYSIA
LEMBAGA KEMAJUAN TRENGGANU TENGAH



TRENGGANU TENGAH

REGIONAL PLANNING
AND
DEVELOPMENT STUDY

VOLUME I
INTRODUCTION & SUMMARY

HUNTING TECHNICAL SERVICES LIMITED

with

Shankland Cox Partnership

NOVEMBER 1974

HUNTING TECHNICAL SERVICES LIMITED

THE GOVERNMENT OF MALAYSIA
LEMBAGA KEMAJUAN TRENGGANU TENGAH

TRENGGANU TENGAH REGIONAL PLANNING AND DEVELOPMENT STUDY

FINAL REPORT

VOLUME I

INTRODUCTION AND SUMMARY

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KUALA TRENGGANU

NOVEMBER 1974



The Hunting Group
Founded 1874

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The Chief Secretary to the Government
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December 1974

Dear Sir,

On completion of the Trengganu Tengah Regional Planning and Development Study, we have pleasure in submitting our Report.

The Terms of Reference required that we should provide a guide in planning for the region over the next twenty years. In the course of doing this it has become clear that further more detailed work will be necessary. This includes three feasibility studies for which we have suggested Terms of Reference. Of these studies the most important is that to confirm whether large scale, group owned oil palm processing facilities should be established.

We also commend to your attention the urgent need for Master Plans to be prepared for the eight new towns proposed in the area.

Implementation of the land development proposals in our report depends upon three major activities:-

- (i) Completion of the Jerangau-Jabor main road and its feeder road network by the end of 1977 to provide access to the sites of the proposed new towns and processing facilities.
- (ii) Early initiation of development of the proposed new towns to provide permanent housing for the labour force on the development projects.
- (iii) Timely implementation of the proposed programme of timber harvesting on those areas to be cleared for agricultural development.

The responsibility for ensuring that these activities proceed smoothly and without delay rests with the Trengganu Tengah Development Authority, whose present existence enhances the prospects for accelerated implementation.

Yours faithfully,

R. J. SPOONER
Director.

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INTRODUCTION

Trengganu Tengah

The area known as Trengganu Tengah was first described as such in a report⁽⁴⁾ prepared by a joint task force of Federal and State officials in 1972. This task force was set up to examine the various development activities in the State of Trengganu and to identify new opportunities for development in the State, specifically in Trengganu Tengah.

In 1973 a Development Authority for Trengganu Tengah (Lembaga Kemajuan Trengganu Tengah) was set up. The Authority was given overall responsibility for planning, promoting and supervising all developments in the area and it immediately started work on putting the recommendations of the Task Force into effect. Large areas of land in Trengganu Tengah were allocated to various public sector agencies and indeed some of these allocations were made by the State Government before the LKTT was established.

During 1973, it was decided that an overall plan should be prepared to give general guidance to the Authority in its operations. Hunting Technical Services Ltd., England (with Shankland Cox Partnership) was invited to carry out the study and the Consultants started work in Malaysia on 16th February, 1974.

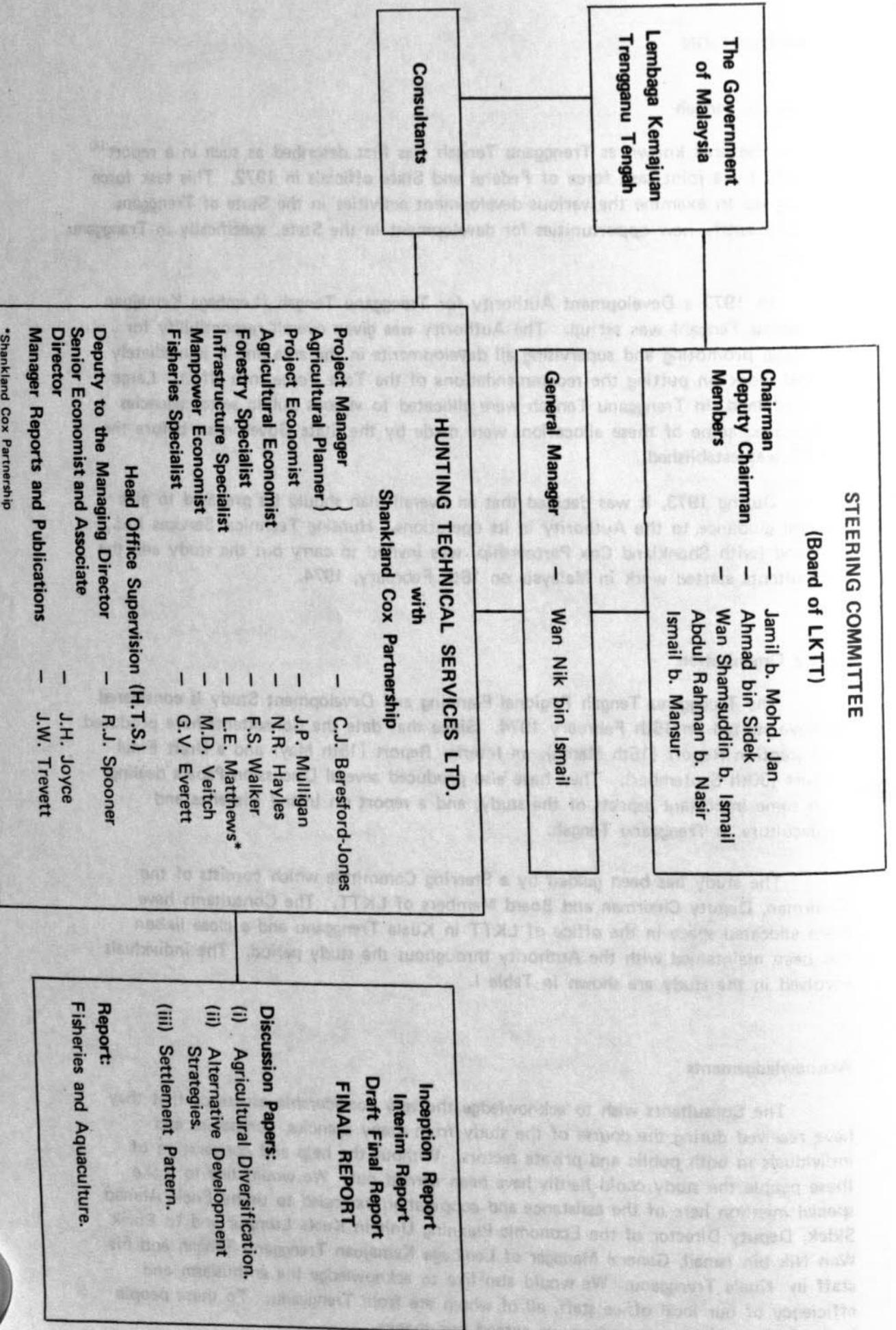
Study Organisation

The Trengganu Tengah Regional Planning and Development Study is considered to have started on 15th February 1974. Since that date the Consultants have produced an Inception Report (15th March), an Interim Report (15th May) and a Draft Final Report (30th September). They have also produced several Discussion Papers dealing with some important aspects of the study, and a report on Inland Fisheries and Aquaculture in Trengganu Tengah.

The study has been guided by a Steering Committee which consists of the Chairman, Deputy Chairman and Board Members of LKTT. The Consultants have been allocated space in the office of LKTT in Kuala Trengganu and a close liaison has been maintained with the Authority throughout the study period. The individuals involved in the study are shown in Table I.

Acknowledgements

The Consultants wish to acknowledge the very considerable assistance that they have received during the course of the study from many agencies, companies and individuals in both public and private sectors. Without the help and cooperation of these people the study could hardly have been carried out. We would like to make special mention here of the assistance and cooperation extended to us by Encik Ahmad Sidek, Deputy Director of the Economic Planning Unit in Kuala Lumpur and to Encik Wan Nik bin Ismail, General Manager of Lembaga Kemajuan Trengganu Tengah and his staff in Kuala Trengganu. We would also like to acknowledge the enthusiasm and efficiency of our local office staff, all of whom are from Trengganu. To these people in particular and to many others we extend our thanks.



*Shankland Cox Partnership

G L O S S A R Y

DARA	—	Pahang Tenggara Development Authority
DID	—	Drainage and Irrigation Department
EPU	—	Economic Planning Unit, Prime Minister's Office
FAMA	—	Federal Agricultural Marketing Authority
FAO	—	Food and Agriculture Organisation (United Nations)
FELCRA	—	Federal Land Consolidation and Development Authority
FELDA	—	Federal Land Development Authority
FIDA	—	Federal Industrial Development Authority
FIMA	—	Food Industries of Malaysia Sdn. Bhd.
FOA	—	Farmers Organisation Authority
IBRD	—	International Bank for Reconstruction and Development (World Bank)
ICDAU	—	Implementation Coordination Development Administration Unit, Prime Minister's Office
ISP	—	Incorporated Society of Planters
JKR	—	Jabatan Kerja Raya (Public Works Department)
JT	—	Jabatan Talikom (Telecommunications Department)
LKTT	—	Lembaga Kemajuan Trengganu Tengah (Trengganu Tengah Development Authority)
LLN	—	Lembaga Letrik Negara
MAJUTERNAK	—	National Livestock Development Authority
MARA	—	Majlis Amanah Rakyat
MARDI	—	Malaysian Agricultural Research and Development Institute
MIDFL	—	Malaysian Industrial Development Finance Ltd.
MRDC	—	Malaysian Rubber Development Corporation
NADEFINCO	—	National Development Finance Corporation
PERNAS	—	Perbadanan Nasional Berhad
RISDA	—	Rubber Industry Smallholders Development Authority
RRI	—	Rubber Research Institute (of Malaysia)
SEDC	—	State Economic Development Corporation
SMP	—	Second Malaysia Plan 1971 — 1975
TDMB	—	Trengganu Development and Management Berhad
UDA	—	Urban Development Authority
cif	—	cost, insurance, freight
drc	—	dry rubber content
ffb	—	fresh fruit bunches (oil palm)

fob	-	free on board
tons	-	long tons (lb 2,240)
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
GVA	-	Gross Value Added
NPV	-	Net Present Value
RSS	-	Ribbed Smoked Sheet (rubber)
SMR	-	Standard Malaysian Rubber

Note:

Unless indicated otherwise the currency unit used in this report is the Malaysian Dollar (Ringgit). U.S. Dollars are converted at US\$1.00 to M\$2.40. References in small type thus⁽²³⁾ refer to the Bibliography, Appendix B in this volume.

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1. SUMMARY AND RECOMMENDATIONS

1.1 The Economic Background

In order to assess the impact of the development plan for Trengganu Tengah it is necessary first to set the existing economy of the region in the perspective of the State and national economies. The basic features of the economies of the Nation, the State and Trengganu Tengah are described briefly in Chapter 2.

The strength of the Malaysian economy in recent years is well known. Underlying weaknesses, however, still persist involving significant regional disparities in income and wealth.

The State of Trengganu, with little developed agricultural land, suffering severely from the North East Monsoon and possessing comparatively poor transportation links with the wealthy West Coast has not benefitted much from the high level of economic growth elsewhere in the Nation. Traditionally the State has relied for income on subsistence agriculture and coastal fishing, both of which are sectors with low productivity. Although the high productivity mining sector was important in 1970 the total number employed was only 2.5 percent of the total labour force. In 1970 the Gross Domestic Product was \$536 per head of the population in Trengganu which was only 59 percent of the national average.

The New Economic Policy aims to reduce these regional economic disparities. Within the State of Trengganu, substantial economic growth during the next 15 years is expected from the offshore oil discoveries, modernization of the coastal fishing industry and industrial development at Kuala Trengganu. Additional benefits are expected from the possible construction of a dam on the upper reaches of the Sungei Trengganu to control flooding, provide additional irrigation facilities and generate electricity.

The economy of Trengganu Tengah was, until 1971, dominated by the large iron ore mine at Bukit Besi. The subsequent closure of this mine left the region with little economic potential unless communications could be improved sufficiently to enable exploitation of the large areas of potential agricultural land.

The construction of the new trunk road running from Jerangau in the north to Jabor in the south is intended to make possible the development of substantial additional agricultural land within Trengganu Tengah thus raising significantly the total value of output within the State.

1.2 Human Resources

1.2.1 Population

The population and labour force of the study area have been considered in detail (Chapter 3 and Appendix C). The primary source of information was the 1970 Census data, particularly that relating to the Districts of Dungun and Kemaman in which Trengganu Tengah is situated.

The population of Trengganu Tengah in 1970 was estimated to be 30,660, of whom 90 percent were Malays. The proportion of males to females (117.3 to 100) is higher than that in the State and the Nation as a whole indicating considerable in-migration of single males during the last decade. This imbalance is likely to be reduced in the future. Household size is smaller than average. Birth rates approach the national average but mortality rates are higher, especially among infants.

1.2.2 Migration

Migration from the State as a whole has been considerable with the biggest receiver of Trengganu migrants being Pahang. Immigration has been greatest from the State of Kelantan. In future it is predicted that most migration will be induced – that is people will move because of definite job opportunities – rather than spontaneous, that is migration with no specific job opportunity in mind. Induced migration is expected to make up any shortfall in the labour force in Trengganu Tengah.

1.2.3 Employment

Employment in Trengganu Tengah is principally based on agriculture. In 1970, the number of economically active people in the area was 11,620 which is 36 percent of the total population and 68 percent of the population aged 15 – 64. Participation was highest among non-Malay males (83 percent) and lowest among Malay females (30 percent). 76 percent of the labour force was male and 86 percent Malay. In 1970, the base year, the Bukit Besi mine was still operating and the census figures for that year reflect this. Since the closure of the mine a considerable proportion of the employees have left the area and mining is now of little significance as an occupation.

1.2.4 Population projections to 1990

Population increase for the development area has been projected using various rates. The median rate suggests that the population of Trengganu Tengah will increase from 30,660 in 1970 to 48,100 by 1990 (Table 1.1). The vast majority of the population will be Malays which is also presently the case.

1.2.5 The Labour Force

The total labour force is projected to increase from 12,500 in 1970 to 17,850 in 1990 (Table 1.1). The increase in the first decade (1970 – 1980) is slow, principally because of the emigration of workers from the Bukit Besi mine and the present age structure of the population which contains relatively few persons aged 5 – 14.

Table 1.1 Trengganu Tengah: Population and Labour Force, 1970 – 1990

	1970	1975	1980	1985	1990
Population					
Males	16,550	16,650	18,900	21,550	24,600
Females	14,110	15,200	17,600	20,300	23,500
TOTAL	30,660	31,900	36,600	41,850	48,100
Labour Force					
Male 15 – 29	4,100	3,400	3,900	4,700	5,400
30 – 64	4,850	5,050	5,550	6,000	6,600
Total	8,950	8,450	9,450	10,700	12,000
Female 15 – 29	1,550	1,450	1,800	2,150	2,500
30 – 64	2,000	2,350	2,600	2,950	3,390
Total	3,550	3,800	4,400	5,100	5,890
Male + 15 – 29	5,650	4,850	5,700	6,850	7,900
Female 30 – 64	6,850	7,400	8,150	8,950	9,900
Total	12,500	12,250	13,900	15,800	17,850

Source: Tables 3.12, 3.15, C.21 and C.23.

1.3 Physical Resources and Infrastructure

1.3.1 The Development Area

Trengganu Tengah has a total area of 1,096,840 acres (Chapter 4), one third of the total area of the State. It is all inland, situated mostly on rolling country, intersected by numerous rivers, the principal ones being the Sungei Dungun and the S. Kemaman (Fig. 1.1).

1.3.2 Climate

The high monsoon rainfall between October and January gives rise to flooding along the rivers and also results in erosion and leaching of the soil. Throughout the area annual rainfall averages more than 130 inches per year. Temperature and relative humidity are uniformly high. The sunshine hours are low for six months of the year which is an absolute limiting factor for some crops. Drought conditions are rare.

1.3.3 Soils

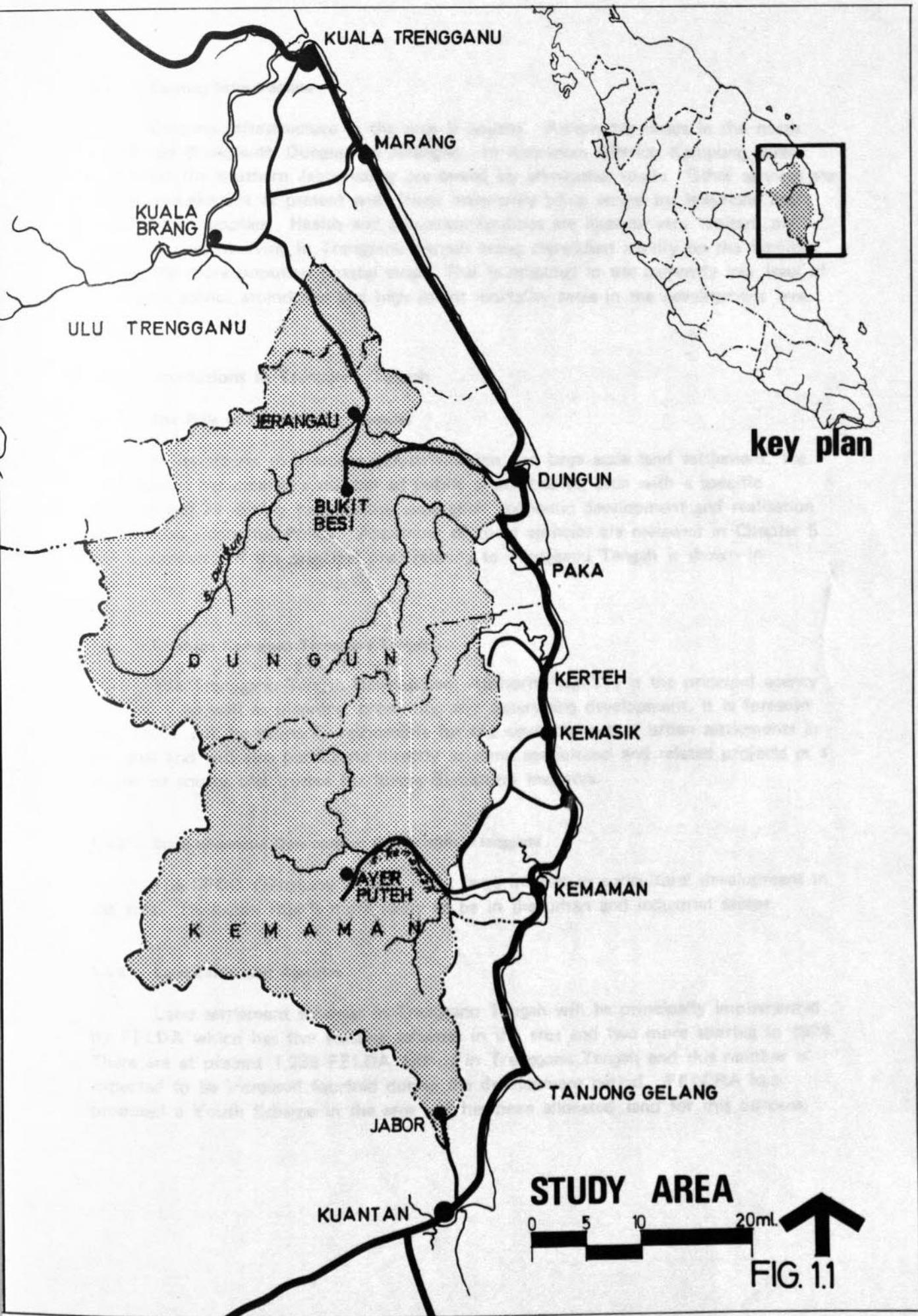
Most of the soils of Trengganu Tengah have only been mapped at a reconnaissance level, which is the bare minimum required for planning purposes. A semi-detailed soil survey is now in progress and should be complete by mid-1975. More than half the area is too steep for any kind of agriculture. There are considerable tracts of forest swamps some of which contain peat soils of varying depth. The soils with greatest potential for agriculture are those in the granite derived Rengam-Jerangau-Kampung Kolam Association and the small area of volcanic soils in the south. There are also considerable areas of seasonally flooded soils, which are fertile but unsuitable for most crops without drainage. The soil types and their potential are summarised in the Soil Suitability Classification for Trengganu Tengah (Appendix D) which has been used as a basis for land use planning in this study.

1.3.4 Forests

The natural vegetation of the area is tropical forest which covers 846,000 acres and is classified into six broad forest types. Primary types still account for over half the area and are estimated to contain 357 million true cubic feet (6.5 million FD tons) of fully marketable timber of exploitable size (18" diameter and over). The expected timber yield per acre varies with the type of forest, the marketability of the various species and sizes of timber and the extent of previous exploitation. Maximum yield from Primary Dipterocarp superior hill forest is estimated to be 16 tons/acre. Recently exploited (1966) forest to be cleared for agriculture could still give more than 3 tons/acre of marketable logs.

1.3.5 Present Land Use

At present more than 80 percent of the area is still covered by forest. Large scale agricultural projects which are either fully developed or under development cover about 160,000 acres and small scale alienations 60,000 acres. The latter is mostly under subsistence level farming or secondary growth. Productive mining activity is limited to about 1,500 acres.



key plan

STUDY AREA



FIG. 1.1

1.3.6 Existing Infrastructure

Existing infrastructure in the area is limited. All-weather roads in the north link Kuala Brang with Dungun via Jerangau. In Kemaman District, Kampung Ayer Puteh and the southern Jabor valley are served by all-weather roads. Other services are almost non-existent at present with fringe areas only being served by telephone and public water supplies. Health and education facilities are likewise very limited, the people at present living in Trengganu Tengah being dependent mainly on the facilities serving the more populous coastal strip. This is reflected in the currently low level of secondary school attendance and high infant mortality rates in the development area.

1.4 Institutions in Trengganu Tengah

1.4.1 The Role of Public Sector Agencies

In its efforts to promote industrialisation and large scale land settlement, the Government has created a number of public sector bodies, each with a specific function but all aiming towards the same goal: economic development and realisation of the New Economic Policy. A number of these agencies are reviewed in Chapter 5 and a summary of the principal ones relating to Trengganu Tengah is shown in Table 1.2.

1.4.2 Lembaga Kemajuan Trengganu Tengah

The Trengganu Tengah Development Authority (LKTT) is the principal agency involved. As well as planning, promoting and supervising development, it is foreseen that LKTT will be primarily responsible for the establishment of urban settlements in the area and will also participate directly in some agricultural and related projects as a holder of equity and trustee for future Bumiputra investors.

1.4.3 State Economic Development Corporation, Trengganu

The SEDC Trengganu already has a large interest in agricultural development in the area. Its future role is more likely to be in the urban and industrial sector.

1.4.4 Land Settlement Agencies

Land settlement schemes in Trengganu Tengah will be principally implemented by FELDA which has five existing schemes in the area and two more starting in 1974. There are at present 1,239 FELDA settlers in Trengganu Tengah and this number is expected to be increased fourfold during the development period. FELCRA has proposed a Youth Scheme in the area and has been allocated land for this purpose.

Table 1.2: Principal Public Sector Agencies Involved in Trengganu Tengah

Agency	Function	ACTIVITIES	
		Current	Future
LKTT	Development Authority for the area	Project evaluation, programming and location	Investment. Urban Planning and construction
SEDC	Investment and development in agriculture and industry	15,000 acre rubber estate	Industrial sites. Agro-processing
FELDA	Land development and settlement	23,000 acres settlement schemes (1,239 settlers)	43,250 acres planned for development (5,415 settlers by 1990)
RISDA	Supervision of rubber planting, extension. Block New Planting projects	18,000 acres estate under development. Replanting programme	Rubber replanting programme.
FELCRA	Land holding consolidation and rehabilitation. Youth settler schemes		4,000 acre Youth scheme
FOA	Farmer development programme	FDC's adjacent to Trengganu Tengah	New FDC's in the area
MARDI	Agricultural research and development	FES Jerangau	New FES

1.4.5 Agricultural Extension and Credit Agencies

In addition to its function as an extension and credit agency to rubber growers, RISDA has a large oil palm estate project in Trengganu Tengah.

Smallholder farmers in the area are being served to some extent by the FOA and this agency has plans for expansion which will benefit more farmers in the development area.

1.4.6 Research Agencies

Research and development on crops and livestock is being carried out by MARDI and MAJUTERNAK, the former already has a Field Experiment Station at Jerangau. It will play a vital role in the agricultural development programme.

1.4.7 Other Agencies

There are possibilities for the production and marketing of some crops by FIMA and FAMA. In the urban industrial sector future roles are foreseen for UDA (in town development) and MARA and PERNAS (in the establishment of Malay owned business).

The work of all these agencies in the area should ensure an equitable share of control and ownership for Bumiputra interests.

1.5. Committed Developments

1.5.1 General

A large part of Trengganu Tengah was committed to certain developments in agriculture and forestry before the present study. In addition, the LKTT requested the Consultants to consider certain proposals to be irreversible commitments to be included in the plan. The planning and design for most of proposed road network has already been completed and the Consultants have advised on the siting of certain feeder roads.

1.5.2 Agriculture

The area of land in Trengganu Tengah alienated for smallholdings is estimated to be 60,000 acres. It is thought that this provides employment for about 5,000 people at present, though many of them probably have other occupations as well. It has not been possible to deal with these areas in quantitative terms due to lack of information on their cropping and economy.

Large scale agricultural projects cover a gross area of 96,688 acres. These consist of estates, settlement schemes (FELDA) and an agricultural research station (MARDI). They are nearly all planted with either oil palm or rubber.

A number of areas for agricultural projects were committed for development before this study. They are mostly public sector undertakings involving FELDA, RISDA, FELCRA and SEDC. In most cases the Consultants have included these projects in their proposals but two areas in Rasau-Kerteh allocated to SEDC (109)⁽ⁱ⁾ and SEDC/NADEFINCO (110), have been re-allocated to FELDA (Chapter 8). The total area of these sited committed projects is 49,400 acres of which 40,000 acres is in the public sector.

The Consultants were also requested to find suitable sites for a number of projects approved by LKTT. These consist of six oil palm estates, two castor estates, one sago palm estate, one grass protein project and a MARDI Field Experiment Station. Provision has been made in the programme for all of these except for the two castor projects.

The Consultants have drawn attention to the inadvisability, in their opinion, of immediate implementation of the grass protein project on a commercial scale. In view of the high capital cost involved, the variable economic factors (especially the rising costs of fuel and fertiliser) and agronomic considerations, it is felt that further investigation on a pilot scale is required.

The agricultural development proposed for Trengganu Tengah before the present study therefore accounted for 236,000 acres. The public sector (especially FELDA) occupies a majority of the area and the dominant crop is oil palm (Table 1.3).

Table 1.3 Classification of Existing and Committed Agricultural Projects by Sector, Management Type and Crop

Type	Gross Area in Acres		
	Public	Private	Total
Estate	55,297	95,656	150,953
Settlement Scheme	67,524	—	67,524
Research	2,634	—	2,634
Other	4,480	10,000	14,480
Total	129,935	105,656	235,591
Crop			
Oil palm	102,441	79,431	181,872
Rubber	20,380	6,658	27,038
Other	7,114	19,567	26,681
Total	129,935	105,656	235,591

Source: Table 8.23.

(i) Numbers in brackets refer to the Area location in Fig. 6.1.

1.5.3 Forestry

Commitments for periods over one year are confined to the Kemaman agreement and twelve sawmills which processed 157,583 tons of logs in 1973.

The Kemaman agreement dated 1974 provides logs for the projected wood-based industries complex in that area. Harvesting is proposed using the "bicyclic" system which allows felling of Dipterocarps down to 24" diameter and other species down to 18" diameter in an annual coupe of 1/25th of a productive area of 50,000 acres. During the course of the study the decision was made to site the industrial complex outside Trengganu Tengah, at Kemaman.

Thirteen sawmill agreements cover 69,000 acres of which 33,000 remain to be harvested over various periods (the longest expiring in 1983). Exploitation is very selective despite agreements because supplies are so abundant. All but one of these sawmills are situated outside the development area. Where these agreements become a constraint to the rate of clearing land for development, their legal force is sufficient to make preferable the phasing of agricultural development with exploitation rather than the reverse.

1.5.4 Infrastructure

The main infrastructure project within Trengganu Tengah is the proposed Jerangau-Jabor trunk road with its feeder road network. Connecting with existing roads in the north, east and south of the development area these roads will provide all-weather access to most of those parts of Trengganu Tengah considered to have potential for agricultural development.

The road study ⁽⁵²⁾ is almost complete and construction should start early in 1975 after the monsoon. Completion of the road is scheduled for late 1977.

The new road will connect directly with the new east coast port at Tanjong Gelang. Work has already started on this project and the first phase should be ready for use in 1976. The port will ultimately have eight berths and a dolphin berth for palm oil shipment. It will be able to accommodate ships of up to 35,000 D.W.T. and 34 ft. draught.

At present Trengganu Tengah is sparsely provided with other public services. There is no public electricity supply, telephone lines serve only those areas along the existing roads and only the settled FELDA schemes are served by a JKR water system.

1.5.5 Mining

Mining is the only other major activity in the area besides agriculture and forestry. Activity at Bukit Besi is now confined to alluvial tin mining and there is limited tin mining activity in the south around Sungei Ayam and S. Tebak.

1.6 Development Objectives

1.6.1 The National Objectives

The development of Trengganu Tengah is planned to meet the national objectives of the Government as stated in the Second Malaysia Plan and the Mid-Term Review. Chapter 7 restates these aims and outlines the strategy which satisfies them best at present. However, present priorities may give place to others in the future and planning guidelines should be flexible to allow possible changes in policy.

At the National level it is recognised that social and economic deprivation is high in the traditional rural sectors. The NEP aims to eradicate poverty in these sectors through the modernisation of agriculture, the raising of incomes and the improvement of social infrastructure. Land development and replanting schemes together with extension of agricultural credit, technical advice and marketing facilities will reduce these imbalances. Further processing of agricultural and forest products in the producing areas will increase the value added within these relatively deprived regions. At present most of the modern agricultural sector is in non-Malay hands but agencies have been set up to invest on behalf of the Bumiputras and training institutions will ensure that Malays will be qualified to participate at all levels.

1.6.2 Trengganu Tengah

The development area is in the rural sector and it will remain a producer of primary products. However, the aim is to ensure that this production is at the highest level possible and that value added from further processing of these products brings direct benefits to the area.

The development of Trengganu Tengah is part of a national plan to raise incomes and living standards throughout the east coast region of Peninsular Malaysia. Its benefits will be felt throughout the State and in neighbouring states. Federal funds are being made available for the development programme.

While one of the prime objectives is to ensure Bumiputra control of development it should be compatible with a substantial level of investment from the private sector.

1.6.3 Development Options in Trengganu Tengah

Much of the area was being developed or was committed to various projects before the start of the present study. There are also considerable natural constraints to development imposed by adverse climate, terrain and soil conditions. The main alternatives are thus confined to forest exploitation and long-term agricultural crops such as oil palm and rubber.

Long term forestry is recommended only on those areas which are unsuitable for agriculture, the returns to capital and labour are attractive, but the returns to land are poor. To increase the value added within Trengganu Tengah it is emphasised that further processing of timber should be based in the area, and, at a later stage, manufacturing might be possible. Royalties from the timber extracted from the agricultural development areas should contribute towards the costs of development in general.

The main strategy in the agricultural sector during the next fifteen years must be to develop projects with a potential for high productivity. There are at present many constraints to diversifying agricultural production and initially development will be concentrated on oil palm and rubber. The former is a more attractive investment than the latter in terms of returns to capital, land and labour. The return to capital from oil palm (assuming labour is costed at \$6 per day but excluding the cost of housing and duties) is 21.5 percent over 25 years whereas the return to rubber over 30 years is 14.9 percent. Rubber is, however, more labour intensive and opportunities exist for planting this crop on land considered only marginal for oil palm. Thus, in the early years development will mostly be based on these two crops, but at the same time an intensified programme of research and development must be implemented to indicate commercial opportunities for other crops for development during the later years of the study period.

The concept of larger settlements in rural areas to bring the benefits of urban life to the agricultural sector has been thoroughly explored in Pahang Tenggara. It is adopted for Trengganu Tengah and each settlement will be planned to serve several agricultural projects and to accommodate forest and agro-based processing plants. Such settlements should be large enough to enable a relatively high level of public services to be supplied at a reasonable cost and to attract secondary commerce and industry with its attendant benefits.

1.7 Proposed Agricultural Development

1.7.1 Planning Guidelines

The proposed programme for agricultural development (Chapter 8) follows the guidelines of the NEP and the Government's declared policy of diversifying the cropping pattern to reduce the risks of relying on a few crops only. The development programme is considered to fall into two parts. The first period from the present date to 1980 will see large areas of land opened for development, mostly with estates and settlement schemes based on oil palm and rubber. At the same time research and pilot projects on other crops will be carried out. After 1980, the results of this research and development will be translated into commercial projects thus realising the goal of greater crop diversification in the area.

The total area in Trengganu Tengah with some potential for agriculture is 524,068 acres (based on Soil Suitability Classes 1 to 4). After subtracting existing and committed projects and small scale alienations, a balance of 282,670 acres remains for planning purposes. A review of this balance shows that about half of this area is suitable for the siting of high productivity agricultural projects.

1.7.2 The Main Crops – Oil Palm and Rubber

In view of the natural constraints of the area and the present level of knowledge, oil palm and rubber are considered to be the most suitable crops for immediate implementation on a commercial scale. Indeed, there are several projects established or in the process of development in the area based on these crops. Experience from these projects indicates that a reasonable return can be expected from both under Trengganu conditions although oil palm is the more attractive.

Projects will either be developed as estates or settlement schemes. While the former are probably a more efficient means of implementing the new technology available they do not meet the socio-economic objectives so satisfactorily as settlement schemes. Small farms scattered on alienated land are traditionally inefficient and significant expansion of this type of development is not recommended for the future. However, the development of group owned processing facilities for oil palm would bring this crop into the existing smallholder farming system. It is recommended that the authorities servicing the independent smallholders should include this possibility in the provision of a full range of services to assist such smallholders to participate in high productivity agriculture.

Oil palm yields of up to 9.3 tons/acre ffb are projected (in Year 8) for the area. For rubber, yields of up to 2,000 lb/acre are projected assuming the use of stimulants after Year 15. Tapping systems will have to be adjusted to compensate for losses due to rain during the intense monsoon period. Project development and initial maintenance work is likely to be done by contractors employing itinerant labour some of whom are likely to be immigrants from other states. Before maturity (start of harvesting) a permanent labour force will be installed in modern housing in the proposed communities. The level of wages and benefits proposed in this study is higher than the national average since it is considered necessary to offer this encouragement to intending immigrants to Trengganu Tengah. Oil palm labour requirements will average about one man to 16 acres but for rubber one man will be required for every 6 acres. Processing of both palm oil and rubber should be in factories serving a group of projects and located in the proposed new settlement centres. This concept is discussed in detail in Chapter 10 under the heading of "Industrialisation."

In spite of the present uncertainties prevailing in the world market the prospects for palm oil, kernels and rubber appear reasonable in the long run. For the purposes of this study the Consultants have assumed a price of \$600 per ton fob for palm oil, \$400 for kernels and 60 cents/lb (132 cents/kg.) for rubber. Using these prices, an economic analysis of oil palm and rubber is presented in Chapter 15.

1.7.3 Prospects for Diversification of Agriculture

A wide range of tropical crops has been reviewed to identify possibilities for diversifying the agriculture of Trengganu Tengah. The major constraints to such a programme are the adverse climatic, terrain and soil conditions in the area and the present lack of knowledge of crop performance under these conditions. The latter constraint must be rectified through the immediate implementation of a programme of agricultural research.

Cocoa, coconuts, fruit trees, sago palm and cattle have been selected as worthy of further study leading to commercial production. Conditions in the area are not suitable for crops requiring regular tillage of the soil and the Consultants positively advise against annual crops, although it is foreseen that limited cultivation of some of these may be done on a seasonal basis on river basin soils. There are also limited possibilities for increasing the production of fresh water fish in the area.

1.7.4 The Proposed Agricultural Development Programme

Agricultural development in Trengganu Tengah from the present time until 1980 will consist of the continuation of existing development programmes, the implementation of previously committed programmes and the implementation of two proposals put forward by the Consultants. The existing development projects have been described earlier (Section 1.5.1 and Chapter 6). Several committed projects have been sited by the Consultants as part of the programme. These are: six oil palm estates (two public sector and four private sector) one sago project, one annual crop project and one new MARDI station. Altogether these projects will occupy an area of 54,193 gross acres (Table 1.4) all of which will be developed before 1980.

Table 1.4 Summary of Existing and Committed Agricultural Projects

	Acres (Gross)
Developed and partially developed (Table 6.1)	96,688
Sited committed projects (Table 6.4)	84,710
Committed projects sited by Consultants (Table 8.21)	54,193
TOTAL	235,591

Source: Table 8.22

Public sector participation accounts for more than 50 percent of these developments and oil palm covers 80 percent of the total area. The Consultants have proposed, in addition, two more allocations to be implemented in the present decade. The first is an extension of the FELDA settlement scheme in Rasau-Kerteh to increase the planted area from 15,000 acres to 23,000 acres. The second is the addition of some 1,100 acres to the private sector oil palm project, Ladang Tenggara, in exchange for an area of similar size on soil suitable for the establishment of a cocoa estate.

During the period to 1980 then, the gross area under large scale agricultural projects will increase from 87,066 acres (66,750 planted) in 1973 to 231,351 (172,121 planted) by 1980. This rate of development is considered to be the maximum possible bearing in mind the constraints imposed by forestry, labour availability and infrastructure.

In addition to the commercial scale projects, the Consultants have strongly recommended that a programme of applied research be started at once by MARDI. As an immediate step the Institute should fully develop the FES Jerangau which is within Trengganu Tengah. There is sufficient land there to accommodate most of the trials required on cocoa, coconuts, fruits and pastures. In addition an area (Area 26) has been allocated to MARDI for a new research station. The long experience of the private sector in agricultural research should also be drawn on to the fullest extent. The Consultants have indicated seven pilot projects on various crops which could be implemented within twelve months. Public and private sector agencies should be informed of these opportunities and invited to submit their proposals. Terms of Reference for a feasibility study on a fruit and vegetable project have been prepared (Appendix F.2).

From 1980 to 1990 most of the development area will be accessible by all-weather roads and the new communities will be developing into small towns. Results from the agricultural research programme and the pilot projects should be sufficiently indicative to enable more commercial implementation of diversified crop projects. In fact, of the 55,716 acres (gross) proposed for development during this period (Table 1.5), 33 percent will be in crops other than oil palm (43 percent) and rubber (24 percent). Public sector agencies will play the major role, the largest public sector project being a 16,000 acre (planted) FELDA settlement scheme based on oil palm. The private sector will also have a chance to bring its expertise in management of new crops to Trengganu Tengah. Certain areas which have potential for development are not included in the programme to 1990. One of these (Area 11 - 992 acres) will not be served by any existing or planned roads and the other two (Area 32 and 33 - total 26,500 acres) in the Cherul Forest Reserve are committed to logging until the year 2,000. Present indications are that there is no justification for developing these areas during the development period.

In summary, the areas proposed for agricultural development will total 287,067 gross acres by 1990. This is equivalent to 213,909 planted acres (75 percent of gross). Although oil palm is still the dominant crop (76 percent, Table 1.6) the acreage under diversified crops has been increased to 10.5 percent of the total, a reasonable target in view of the constraints previously outlined. The crops are coconuts (5,395 acres) cocoa (3,468 acres) fruits (4,051 acres) citrus (8,320 acres) vegetables (825 acres) annual crops (1,000 acres) grass for manufacturing (3,000 acres) sago (400 acres) and cattle (1,152 acres). 1,875 acres is for research (MARDI). Five new rubber estates have been proposed since it is felt that this crop will be most profitable grown on the estate system. The public sector accounts for 55 percent of the development in terms of area. Furthermore, it is anticipated that there will be considerable public sector equity investment in the private estate sector to ensure an equitable level of Malay ownership in line with the NEP objectives. The public sector agencies principally involved in direct development are FELDA, RISDA, SEDC and FELCRA (Table 1.7).

**Table 1.5 Agricultural Projects Proposed for 1980 – 1990
by Crop and Sector**

	Gross area in acres			
	Public	Private	Total	Percent
Oil palm	21,781	2,208	23,989	43
Rubber		13,405	13,405	24
Coconuts	4,422	2,771	7,193	13
Cocoa		1,985	1,985	3
Fruits	5,401		5,401	10
Citrus		1,107	1,107	2
Vegetables	1,100		1,100	2
Cattle	1,536		1,536	3
TOTAL	34,240	21,476	55,716	100

Source: Table 8.31

**Table 1.6 Agricultural Development 1970 – 1990 by Sector,
Management Type and Crop**

Type	Planted area in acres			
	Public	Private	Total	Percent
Settlement Scheme	70,693	–	70,693	33
Estate	42,725	98,616	141,341	66
Research	1,875	–	1,875	1
TOTAL	115,293	98,616	213,909	100
Crop				
Oil palm	87,071	76,212	163,283	76
Rubber	17,002	11,628	28,630	13.5
Other	11,220	10,776	21,996	10.5
TOTAL	115,293	98,616	213,909	100
Percent	54	46	100	100

Source: Tables 8.34, 8.35 and 8.36.

Table 1.7 Agricultural Development by Agency in 5 Year Plan Periods, 1973 - 1990

Malaysia Plan - Agency	Planted area in acres					Total planted acres	Percent
	at end 1973	Second 1974-75	Third 1976-80	Fourth 1981-85	Fifth 1986-90		
FELDA	21,582	15,775	13,825	14,016	4,336	69,534	32.5
FELCRA	-	1,000	3,000	-	-	4,000	2.0
RISDA	-	8,000	10,000	-	-	18,000	8.5
FAMA	-	-	300	1,241	-	1,541	0.5
FIMA	-	-	150	900	1,508	2,558	1.0
MAJUTERNAK	-	-	-	1,152	-	1,152	0.5
SEDC	10,180	5,200	-	-	-	15,380	7.0
MARDI	379	296	1,200	-	-	1,875	1.0
Other (1)	34,609	6,713	42,987	15,207	353	99,869	46.5
TOTAL (acres)	66,750	36,984	71,462	32,516	6,197	213,909	100.0

(1) Mostly PRIVATE SECTOR projects.

Source: Table 8.37.

1.7.5 Agricultural Production

Production of all crops will increase considerably during the development period and while the production of oil palm will stabilise towards 1990 production from other crops will still be increasing in the 1990's (Table 1.8).

Table 1.8 Agricultural Production 1973 – 1990

	1973	1975	1980	1985	1990	Units
Oil palm	163.7	314.7	575.9	1,238.0	1,297.2	'000 tons ffb
Rubber	1.05	1.43	5.82	12.43	18.17	'000 tons drc
Cocoa	270	390	690	980	1,468	tons dry cocoa
Coconuts	—	—	—	58/1403 ⁽¹⁾	3393/8597	tons dry copra
Fruits	—	—	—	3,177	10,104	tons
Citrus	—	—	—	450	2,940	tons
Vegetables	—	—	—	2,250	4,500	tons
Annual Crops	—	150	1,000	1,000	1,000	tons
Sago	—	—	—	3,400	4,000	tons sago flour
Grass products	—	—	26,000	28,000	28,000	tons protein & pellets

(1) Traditional varieties/hybrids.

Source: Section 8.10.

1.7.6 Manpower Requirements

The agricultural sector will be the biggest source of employment in Trengganu Tengah. Total employment in agriculture (excluding processing) is estimated to rise from about 6,500 in 1973 to nearly 18,000 in 1990. Of the latter, 115 will be in managerial positions, 600 in clerical or field supervisory positions, more than 11,500 will be working on estates as unskilled labour and some 5,400 will be smallholders on public sector settlement schemes. In addition there will be numerous opportunities for part time employment during the peak harvesting season of fruits and other crops.

1.7.7 Implementation of the Agricultural Development Programme

Implementation of the agricultural programme will require a firm central control to ensure that overall policy objectives are met and technical standards are upheld. This control will principally be exercised by the LKTT. The programme for Trengganu Tengah is largely based on agriculture and to assist the Authority in dealing with this aspect we have recommended that the Development Authority should engage an Agriculturalist at once for a period of at least 5 years. It is anticipated that the new concepts of centralised processing and settlement pattern (recommended in Chapters 10 and 12) will meet with scepticism in some quarters and a strong public relations effort will have to be mounted to inform investors that these policies are a pre-condition to participation in Trengganu Tengah. Other agencies will support the LKTT

both as advisors and developers. The importance of MARDI to the progress of diversifying agriculture cannot be over-emphasised. It is felt, however, that other agencies in both public and private sectors can assist in this respect and should be fully informed of the possibilities open to them.

1.8 Proposed Forestry Development

1.8.1 Forest Reserves and Conservation

There are more than 600,000 acres of permanent forest in Trengganu Tengah. In addition about 145,000 acres of forest land remains to be cleared for agricultural development. The Consultants proposals (Chapter 9) commence with suggestions for dividing the permanent forest into reserve areas, where these do not presently exist. The reserves are administrative units for Forest Department supervision and revenue collection. They are also essential to ensure that correct conservation practices are observed and this aspect cannot be emphasised too strongly in the context of Trengganu Tengah. The existing and proposed Forest Reserves will cover 573,580 acres with an additional special reserve area (Chenderong Concession) of 58,170 acres. Of the former, amenity and protective reserves account for 37,900 acres and the balance (535,680 acres) is considered to be productive forest.

1.8.2 Exploitation of Forest Resources

More than half of the permanent forest reserve area has been allocated to two wood-based industrial complexes. The first of these (the Kemaman Complex) has already commenced operations and has been allocated 81,270 acres of forest in the Cherul Reserve. The decision has already been made to site the industrial complex outside Trengganu Tengah in Kemaman. Part of the forest area allocated has been identified as having potential for agriculture. Under the harvesting system proposed (Bicyclic System) the area could be released for development from the year 2,000.

The second complex (the Dungun Complex) will harvest its timber from 288,470 acres of forest reserves in the Dungun District. Negotiations for the project between the Trengganu State Government and the Government of Romania have been in progress during the course of the study, and the Consultants have been requested to consider it as a firm commitment for incorporation in the development plan. However, we have been unable to study the proposals submitted so far and can therefore make few comments about the project. A project of this kind, with its potential for further processing within the region is definitely recommended and we strongly recommend that the industrial complex should be sited within Trengganu Tengah at one of the new settlement centres.

Both the complexes are to base their harvesting programme on the Bicyclic Felling System which allows felling of selected species and sizes twice during 50 years. This system is still untried in Malaysia and the Consultants believe that it would not be wise to insist too rigidly on it in the early years. Fortunately there is enough forest land to allow some flexibility in planning the harvesting cycles and a first cycle of 40 years is suggested for both complexes pending further study of the system.

The remaining area (165,940 acres) of productive forest is allocated to sawmills already existing in or near Trengganu Tengah. This is in line with FAO recommendations which are endorsed because estimates of production show a marked reduction in log availability after 1977. In the long-term this trend could lead to a rationalisation of the sawmilling industry in the area.

The Consultants put forward some suggestions for improving efficiency in logging operations mainly in the transportation from forest to factory. Larger vehicles than are used at present in Malaysia have demonstrated considerable savings in cost in other countries. The new public road system and better forest roads could lead to their introduction here.

The question of pine planting for fibre production has also been considered but it is concluded that this would only be feasible on land suitable for agriculture and is thus an uneconomic use of land resources.

1.8.3. Phasing of Forest and Agricultural Development

The Terms of Reference for this study specifically require the Consultants to propose a phased programme for agriculture to coincide with forest development. This is presented in detail (Section 9.3). If the programme is followed no constraints to the agricultural development programme are foreseen and the volumes of timber produced should be marketable under present conditions. However, for the phased programme to be workable there must be forward planning of operations at least two years ahead and coordination between LKTT and the State Forest Department is of paramount importance.

1.8.4 Output, Marketing and Employment

Assuming that fully marketable timber down to 18" diameter size will be removed, an average yield of 11 FD tons per acre is expected. Log production will decline rapidly after 1977 because most of the areas designated for agricultural development will have been cleared. The value of production will not decline so rapidly since the increasing level of further processing of logs at the Dungun Complex will result in a greater proportion of value added accruing to Trengganu Tengah. By 1990, it is estimated that 55 percent of all log production will go through the Dungun Complex and a further 16 percent through the Kemaman Complex. Between 1975 and 1985, the Dungun Complex will provide employment for an additional 465 persons in the forestry sector, about 25 percent of whom will be in managerial or skilled positions.

1.9 Proposed Industrial Development

1.9.1 General

Industrial development in Trengganu Tengah (Chapter 10) will mostly be based on the processing of agricultural and forest products from the area. Other growth poles near the area offer far greater attractions to investors in secondary industry. In the long-term however, pressures within these growth poles could lead industrialists to consider Trengganu Tengah as an alternative site for their operations. In the meantime, an embryo industrial base should be built up by siting processing plants for palm oil, rubber and timber in the new communities proposed for the area.

1.9.2 Palm Oil Processing

Production of ffb in Trengganu Tengah is projected to increase from 163,000 tons in 1973 to nearly 1.3 million tons in 1990. Additional milling capacity will be needed to process the crop and three new mills have already been proposed. In addition the Consultants recommended the building of four more mills one of which will serve the new FELDA scheme proposed in Pasir Raja. The other three mills will serve new oil palm estates on a group basis. The mills will all be located in industrial sites in the new communities. The concept of centralised processing is relatively untried in Malaysia. In terms of economy of scale there is no question of the advantages of the system compared with smaller estate-based mills. The Consultants feel that it is a vital component of the proposed centralised settlement pattern, but further, more detailed study is required and this should be started as soon as possible (Appendix F.1). Assuming that the palm oil mills are developed using the group processing concept, the new mills have been sited and phased in terms of cost and manpower requirements, including detailed estimates of skilled manpower. By 1990 the nine mills in Trengganu Tengah will employ nearly 1,200 people over 200 of whom will be managerial or skilled staff.

1.9.3 Rubber Processing

Only two rubber factories are proposed for Trengganu Tengah. One is already planned to serve the SEDC estate at Bukit Besi. The other will serve the new rubber estates proposed in the south of the area and will start operating in 1987. The phased development and cost estimates are presented in detail and the proposed investment for both factories during the planning period is \$3.8 million. Together they will provide employment for 173 people after 1987.

1.9.4 Timber Processing

Of the two wood-based industrial complexes proposed for Trengganu Tengah, one has already been based in Kemaman. It is strongly recommended that the second (the Dungun Complex) be sited at the new sub-regional centre, Community C, to strengthen the industrial base there. It would also be adjacent to the forests from which the logs are to be harvested. Investment projections are confined to the Dungun Complex and in the absence of other information are based on proposals for a sawmill complex recommended by FAO.

1.9.5 The Industrial Development Plan

The seven additional mills for producing palm oil are the largest component of the proposed industrial development. Phasing (Table 1.9) of the new mills, rubber factories and the timber complex is dependent upon the scheduled completion of the new road network. The total capital cost of industrial processing facilities will have exceeded \$88 million by 1990. Of this, 90 percent will have been invested in palm oil mills.

Employment in the industrial sector will increase from 206 in 1975 to 1,599 in 1990. Managerial and skilled personnel will account for 25 percent of those employed.

Table 1.9 Proposed Phasing and Manpower Requirements of Industrial Processing Facilities, 1975 – 1990

	1975	1980	1985	1990
Palm Oil Processing				
No. of mills	2	7	8	9
Capacity: ton/day	110	230	430	460
Total installed '000 tons/year 2 shift	528	1,104	2,064	2,208
Total installed '000 tons/year 3 shift	600	1,380	2,580	2,700
Total throughput '000 tons/year ffb	315	576	1,238	1,297
Percentage utilization – whole year				
2 shift	60	52	60	59
– peak month				
3 shift	95	75	86	85
Employment	206	636	1,110	1,184
Rubber Processing				
No. of factories	–	1	1	2
Total installed capacity, tons/month drc	–	500	1,250	1,750
Peak monthly throughput (tons drc)	–	418	1,073	1,661
% Utilization, peak month	–	84	86	95
Employment	–	57	116	173
Timber (Dungun Complex)				
Total capacity ('000 cu. ft./yr.)	–	2,800	5,600	5,600
Total log intake ('000 cu. ft./yr.)	–	2,475	4,950	4,950
% Utilization	–	88	88	88
Employment	–	121	242	242

Source: Tables 10.17 and 10.18.

1.10 Population Migration and Training

1.10.1 Employment Projections

Estimates of employment in Trengganu Tengah have been prepared (Chapter 11) from 1970 to 1990. The total employment in the area is expected to increase more than threefold from 1970 to 1990. In the primary sector agriculture will be the largest employer of labour with forestry and mining making relatively small impact. In estimating non-primary employment in the area a ratio of 3:2 (primary to non-primary) has been used.

1.10.2 Sources of Manpower

Employment is projected to grow much faster than the natural increase of the labour force in Trengganu Tengah (Table 1.10). Considerable migration into the area is foreseen and this is most likely to come from other parts of the State where projections indicate a substantial level of unemployment in the future. In fact, if all the migrants required for Trengganu Tengah are drawn from within the State, there will still be a considerable surplus of labour in Trengganu throughout the development period.

Table 1.10 Trengganu Tengah: Employment and the Labour Force, 1970 - 1990

	1970	1975	1980	1985	1990
Projected employment	11,120	15,050	26,950	32,950	38,150
Trengganu Tengah labour force	12,500	12,250	13,900	15,800	17,850
Excess	-1,380	2,800	13,050	17,150	20,300
	1970-75	1975-80	1980-85	1985-90	
Required number of immigrants	3,770	10,250	4,100	3,150	

Source: Table 11.3.

1.10.3 Migration

Although the number of job opportunities for migrants to Trengganu Tengah will be substantial it is not possible to forecast the likely response to this. Migration, whether interstate or intra-state depends on qualitative factors, assessment of which is outside the scope of this study. There is definitely a need for a sociological survey to determine, for example, the attitude of coastal fishermen towards settlement inland on smallholder schemes.

Migrants are likely to be mostly male youths in the 15 – 29 age group whose aspirations may draw them to the counter attractions of other development areas in Pahang and Johor and the urban centres at Kuantan and Tanjong Gelang in preference to Trengganu Tengah. However, experience in the past has shown that Trengganu has attracted migrants from other States, particularly from Kelantan and this trend may continue.

1.10.4 Total population growth of Trengganu Tengah

Assuming that the manpower requirements of the development area are satisfied, the population will increase more than fourfold during the study period. By 1980 more than half the population will consist of migrants from outside Trengganu Tengah (Table 1.11).

Table 1.11 Trengganu Tengah: Estimated Total Population, 1970 – 1990

	1970	1975	1980	1985	1990
Males	16,550	22,750	44,100	57,750	71,500
Females	14,110	19,950	37,650	50,000	62,850
Total	30,660	42,750	81,750	107,700	134,350
Migrants	—	10,850	45,250	65,900	86,250

Source: Table 11.11, 11.12, 11.13 and 11.14.

1.10.5 Training

The largest source of employment will be agriculture. The need for formally trained personnel in this field is relatively small and the majority of skills are learnt on the job. There will be a need, though, for experienced managers and supervisory staff to ensure successful implementation of the ambitious development programme. Existing and proposed agricultural education centres, in the State and on a national level appear to be adequate to meet future demands. However, there may be an initial shortage of trained agricultural personnel due to the competing demands of other development areas in the country. The private sector of the agricultural industry can provide much useful assistance to overcome this bottleneck.

The agricultural processing industry requires a much higher proportion of skilled manpower. Such personnel should be forthcoming from the new Vocational Schools in Kuantan and Trengganu but their training must be supplemented by practical experience and the industry itself must offer facilities for practical training.

The availability of skilled personnel for non-primary industry is hard to quantify. The most urgent immediate requirements are likely to be in the construction industry and there could be a bottleneck in this sector, if major construction programmes are on-going in other parts of the State.

The scope of this study has not allowed for a comprehensive survey of training problems which would have to include assessments at the State and national level. Constraints are likely to be short-term, however, and should be removed by 1980, when graduates from the new training centres appear on the market. The Consultants do not consider that the demands of Trengganu Tengah justify the establishment of formal training facilities in the area itself.

1.11 Settlement Pattern

1.11.1 Settlement Pattern Standards

In selecting the most suitable settlement pattern for Trengganu Tengah (Chapter 12) the Consultants have drawn on guidelines first worked out for Pahang Tenggara which are now generally recognised on a national level. These guidelines indicate that, if the objectives of the NEP are to be met with regard to raising living standards and amenity standards in rural areas, the new communities planned for these areas, must contain a much larger population that has previously been the case. It has now been determined that a community with a population of 15,000 or over will support a reasonable level of secondary industries, public services and amenities which are not viable or economic in smaller communities. The relation of population, employment and support area required for a viable community is dealt with in Appendix G and the conclusions drawn from this are applied to the requirements of Trengganu Tengah.

1.11.2 Settlement Proposals

The present settlement pattern in Trengganu Tengah consists mainly of numerous small kampungs, which are often isolated, liable to seasonable flooding and poorly provided with public services. In 1970, 83 percent of the population were living in communities of 200 or less. The new communities proposed for Trengganu Tengah will be based primarily on agriculture and forestry. Eight new settlements have been proposed and their catchment areas have been defined on the basis of a maximum travelling time to work of 30 minutes. Besides the workers in primary employment, the support population has been calculated and it has been shown that as total population increases the proportion of primary workers decreases.

While the new communities will not replace the existing kampungs and other small settlements they will absorb most of the additional population of the area (Table 1.12).

Table 1.12 Proposed New Communities for Trengganu Tengah

Community	Estate Town	District Centre	Sub-Regional Centre	1975	1980	1985	1990
A. Bukit Besi	0			1,825	5,543	7,280	7,561
B. FELDA Rasau-Kerteh Junction F2		0		200	11,108	13,158	13,015
C. Durian Mas			0	45	14,224	25,950	33,582
D. 3rd Milestone F7		0		41	4,660	6,965	11,881
E. Junction F9		0		133	4,343	9,343	11,738
F. FELDA Neram	0			1,428	4,638	5,481	6,798
G. FELDA Pasir Raja	0			0	0	1,595	7,499
H. FELDA Jerangau	0			3,687	5,752	6,218	6,273
Total population of proposed communities				7,359	50,268	75,990	98,347
Total population of Trengganu Tengah				42,750	81,750	107,700	134,350

Source: Table 12.4

Several levels of settlement are proposed, the largest being the Sub-regional service centre, the "capital" of Trengganu Tengah. Of the eight new communities proposed, six will be completely new towns and the other two, Communities A and H will be based on the existing settlements at Bukit Besi Mine and FELDA Jerangau respectively. All the new towns except Community A will have one or more plants for processing agricultural or forest products. Four of the Communities will be based on FELDA settlement schemes (B, F, G and H) but with a far higher level of services and amenities than those previously associated with settlement projects.

1.11.3 Implementation of the Settlement Pattern

The Settlement Pattern proposed by the Consultants is considered essential to meet the socio-economic objectives of the NEP. However, the concept of centralised housing and processing facilities for agricultural areas is a new one and is likely to meet some opposition from a traditionally conservative industry. The timing of development is also crucial to ensure success. The prime responsibility for successful implementation of the settlement pattern lies with the LKTT who will have to take firm and positive action at all levels. Critical points which have been identified are as follows:-

- (i) Immediate need for a Master Plan Study for the new towns.
- (ii) Phased programme for development of each town (an abstract structure plan is presented in Chapter 12 – Fig. 12.6).
- (iii) Establishment of local councils/town boards to administer each community and enforce standards.

1.12 Infrastructure

1.12.1 Planning Standards

In assessing the infrastructural needs of the study area desirable minimum standards for Peninsular Malaysia in general have been used (Chapter 13). These standards, particularly of housing and public utilities, are much higher than exist at present. Taken together, they will require a very heavy investment of public funds throughout the development period. There can be no question, however, regarding the justification for such an investment if the programme of development is to be a success. It is clear that development will depend heavily on an inflow of migrants from other parts of the State, many of whom will be leaving more attractive coastal or urban areas. Such people are unlikely to be attracted on a permanent basis unless an adequate social and physical infrastructure is provided in addition to the prospect of regular employment.

1.12.2 Housing and Services

The eight proposed new communities will eventually house some 98,000 people out of the total population of 134,000. A higher standard of housing than that usually associated with the rural sector is proposed. Each community will be served by an adequate urban road system, water supply and electricity. The latter will be drawn from the National Grid by a new transmission line crossing the development area. Total capital costs of these proposals will be \$177 million over the development period and operating costs will be \$75 million. Additional services will be needed such as public transport, telephones and eventually a central sewerage system for each community. However, the costs of these will be small compared with the basic infrastructure outline above.

1.12.3 The Road System

The main road network already proposed for Trengganu Tengah will provide access to most parts of the area with development potential. Construction is scheduled to begin in early 1975 and the capital cost is now estimated at \$65 million. The Consultants have also indicated the need for an additional 18 miles of all-weather road to serve certain areas not included in the Jerangau-Jabor Road proposals. Priority should be given to an early completion of the feeder road F5/F6 which will provide access to the site of the Sub-regional Centre (C) and the proposed FELDA community (B). Total capital costs of all roads have therefore been estimated at \$73 million and maintenance costs during the period to 1990 at \$7.5 million.

1.12.4 Social Infrastructure

Development of Trengganu Tengah will bring with it the benefits of modern medical and dental services including two hospitals and thirteen health sub-centres during the development period. By 1990 also it is proposed that there will be 44 primary schools and 21 secondary schools in the area which should result in a far more satisfactory level of attendance at both primary and secondary levels. Other social amenities and necessary services have been considered such as postal, police and fire services and additional religious buildings.

Requirements for all these services in each community have been phased and costed.

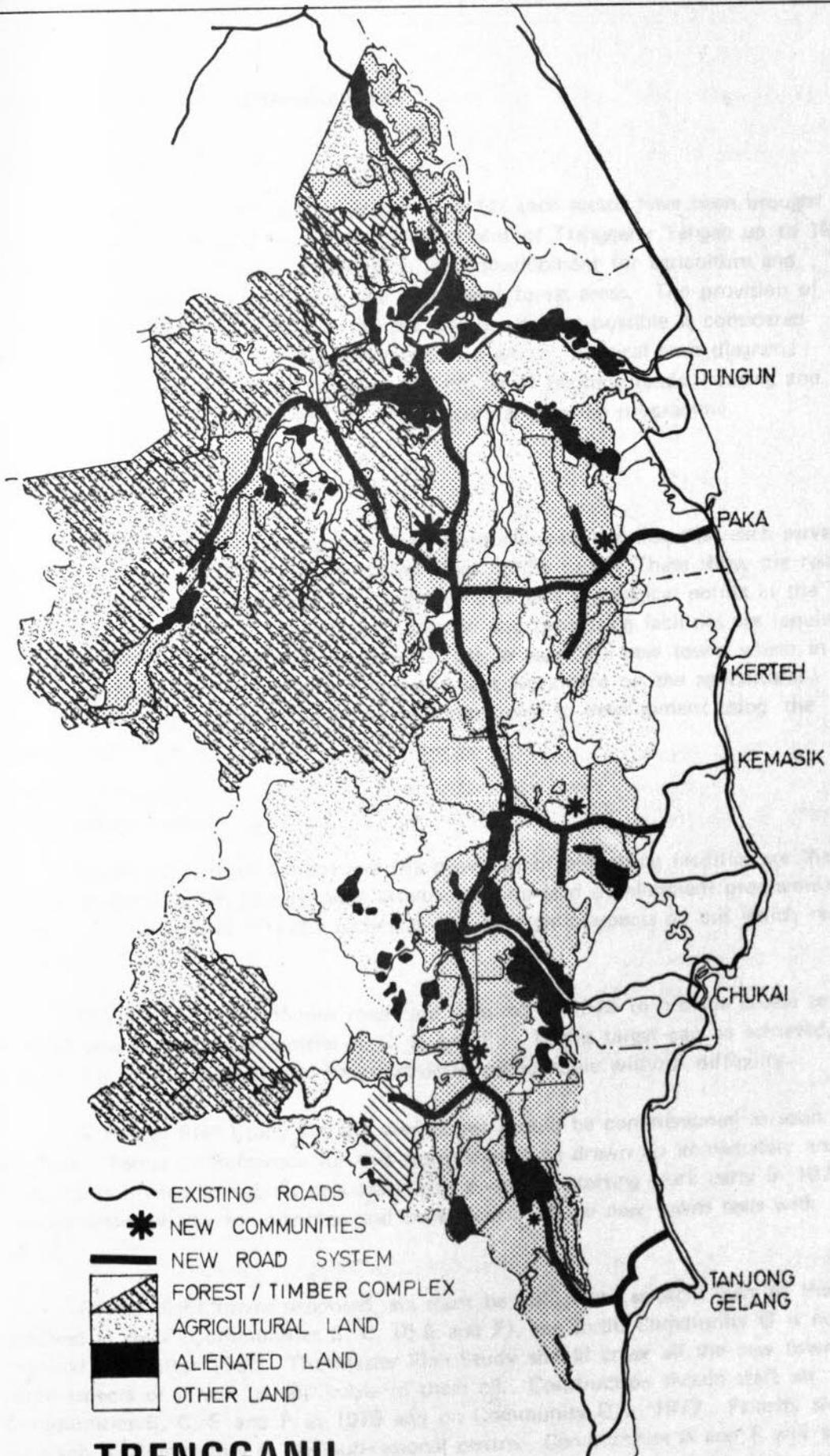
1.12.5 Total Infrastructure Costs

The total cost (Table 1.13) of the proposed infrastructure is estimated to be \$565 million of which \$281 million is capital expenditure. The majority of this is public sector expenditure and will have to be met from State and Federal funds or international loans. Private sector financing is estimated to meet only 15 percent of capital costs and 3 percent of maintenance costs. About \$310 million of the total cost is classed as non-recoverable but services such as housing, water and electricity supply, postal services and a part of the health services will be self-financing. This will require long-term financing of a major part of the initial capital cost.

Table 1.13 Trengganu Tengah: Summary of Infrastructural Costs, 1975 – 1990

Capital Costs	1975–80	1981–85	1986–90	1975–1990
	\$ '000			
Housing, water, electricity	13,485	9,455	8,285	169,610
Urban roads	613	438	378	7,758
Main highways and feeder roads	10,833	1,600	–	73,000
Health services	548	341	248	6,233
Education	910	1,393	1,341	19,130
Other community services	557	235	190	5,467
Total capital costs	26,946	13,462	10,442	281,198
Operating Costs				
Housing, water, electricity	1,922	4,977	7,098	71,907
Urban roads	92	239	341	3,452
Main highways and feeder roads	200	600	675	7,575
Health services	714	1,521	1,996	21,869
Education	5,588	10,776	18,280	178,808
Other community services	not estimated			
Total operating costs	8,516	18,113	28,390	283,611
Total Infrastructural Costs	35,462	31,575	38,832	564,809
of which: Private Sector				
capital	3,202	2,338	2,230	42,052
operating	192	532	854	8,082
Public Sector				
capital	23,744	11,124	8,212	239,146
operating	8,324	17,581	27,536	275,529
Total	35,462	31,575	38,832	564,809
of which: Self Financing				
capital	10,466	7,159	6,095	129,068
operating	2,087	5,236	7,366	75,532
Residual, financed from tax base				
capital	13,278	3,965	2,117	110,078
operating	6,237	12,376	20,294	200,772

Source: Table 13.14.



**TRENGGANU
TENGAH 1990**



FIG. 1.2

Table 1.13: Tengganu Forest Inventory and Land Use Statistics (1980)

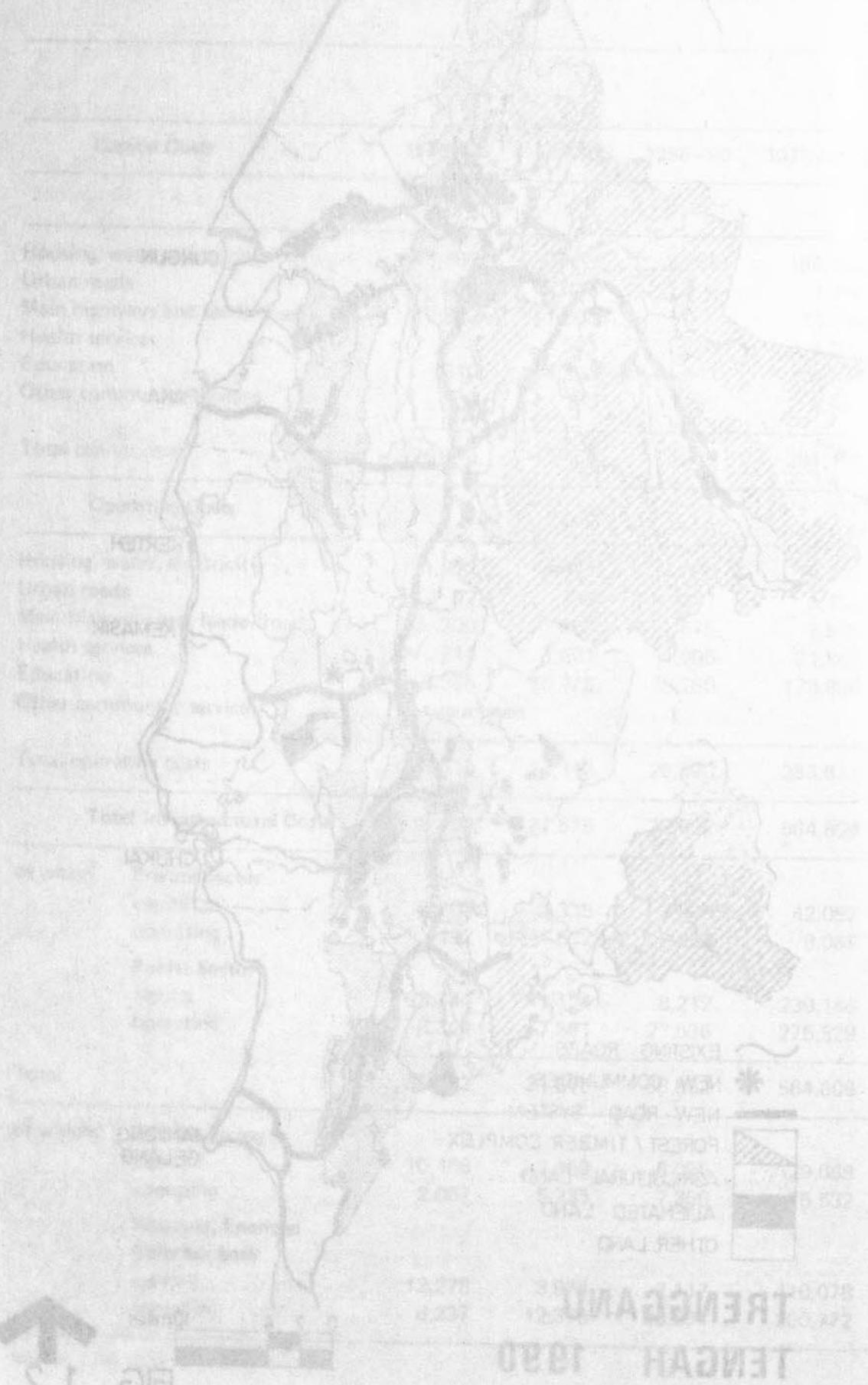


FIG. 1.3

1.13 Implementation of Development

1.13.1 The Structure Plan

The proposed development programmes for each sector have been brought together (Chapter 14) and the phased development of Trengganu Tengah up to 1990 presented (Fig. 1.2). The emphasis is on land development for agriculture and sustained yield logging operations in the permanent forest areas. The provision of infrastructure, housing and services to the area as soon as possible is considered essential to the success of the development as a whole. Critical path diagrams (Figs. 14.2 and 14.3) demonstrate that the timing of building roads, housing and processing facilities is determined by the agricultural planting programme.

1.13.2 Phased Development

Taking the proposed new towns as the nucleus of the area that each serves, a series of flow diagrams has been prepared (Figs. 14.5a to f). These show the relationship between logging operations and land clearance and the critical points in the agricultural programme at which roads, housing and processing facilities are required. In each case, road development is required first to serve the new towns which in turn are needed to provide housing for the permanent workforce on the agricultural projects. Logging does not appear to be a constraint to development using the phased programme proposed.

1.13.3 Priority Projects

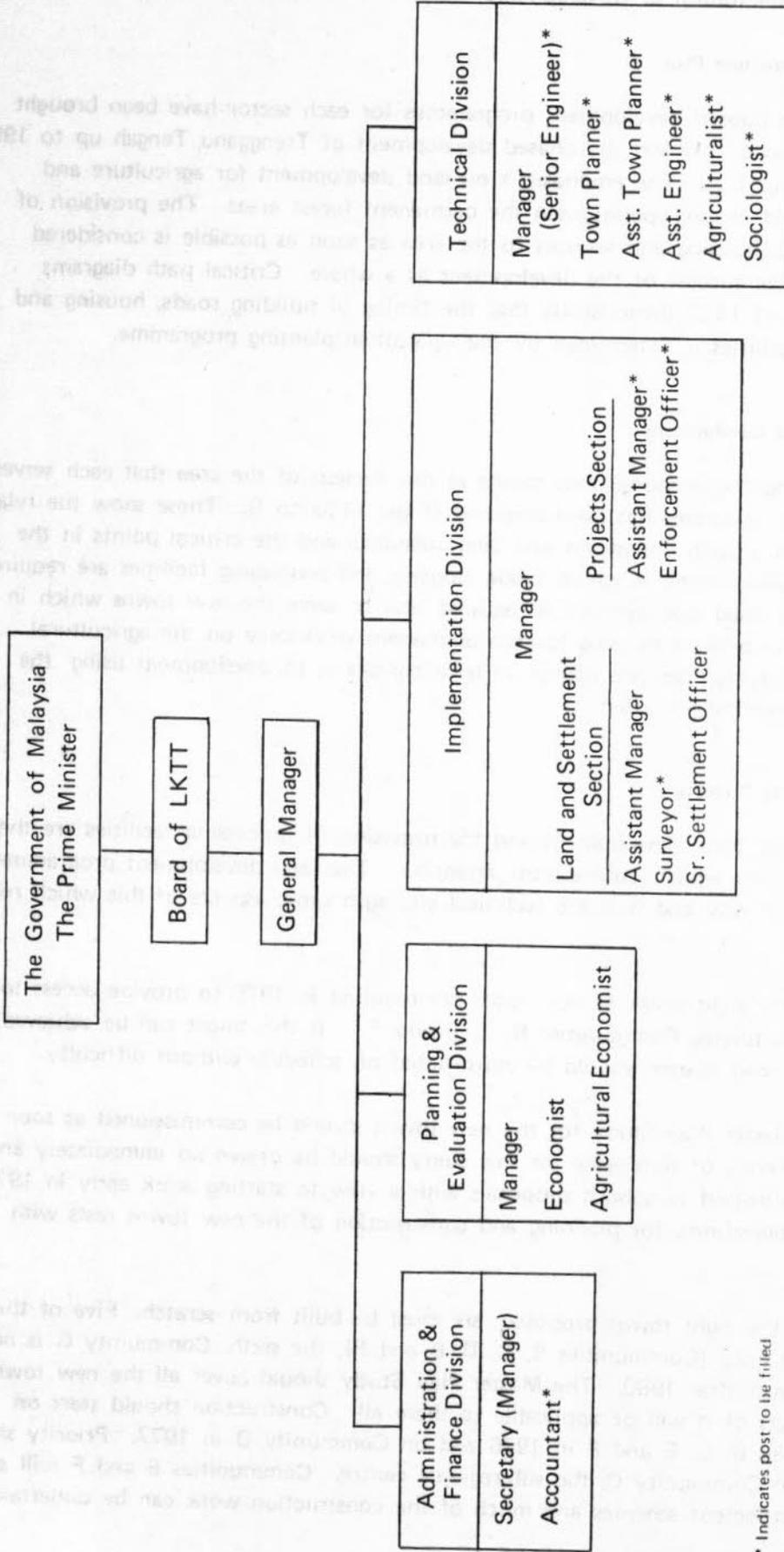
Roads, town development and the provision of processing facilities are the priority projects which require most attention. The land development programme is already under way and it is the technical and agronomic aspects of this which require action.

Thirty eight miles of new roads are required in 1975 to provide access to the sites of new towns, Communities B, C, E and F. If this target can be achieved, the rest of the road system should be constructed on schedule without difficulty.

A Master Plan Study for the new towns should be commissioned as soon as possible. Terms of Reference for this study should be drawn up immediately and consultants invited to submit proposals with a view to starting work early in 1975. Overall responsibility for planning and construction of the new towns rests with the LKTT.

Of the eight towns proposed, six must be built from scratch. Five of these are required at once (Communities B, C, D, E and F), the sixth, Community G is not required until after 1980. The Master Plan Study should cover all the new towns since some aspects of it will be applicable to them all. Construction should start on Communities B, C, E and F in 1976 and on Community D in 1977. Priority should be given to Community C, the sub-regional centre. Communities B and F will serve FELDA settlement schemes and much of the construction work can be undertaken by

Table 1.14 Proposed Organisation of Lembaga Kemajuan Trengganu Tengah



* Indicates post to be filled

Source: Table 14.5

this agency. It seems likely that the entry of settlers to the FELDA Neram scheme, due in 1975, will be delayed because Community F will not be ready to accommodate them. Communities A and H are already in existence and will require enlarging.

Five new palm oil mills are to be built between 1975 and 1980, three of which will be group-owned mills processing ffb from a number of public and private sector estates. LKTT should play the principal role in introducing the concept of centralised processing and in setting up an Oil Palm Milling Corporation to run the new mills. A new rubber factory to serve the SEDC Bukit Besi Rubber Estate is soon to be built and it should be sited at Community C. A decision will shortly be taken on the siting of the Dungun Forest Complex factory. The Consultants recommend that it too is sited at Community C.

In the forestry sector, the progress of logging areas to be released for agricultural development should be closely watched and delays anticipated. Planning for the areas still unlicensed should be done well in advance and boundaries demarcated in accordance with correct land use principles. The agricultural programme is well in hand. The ongoing soil survey should be directed to priority areas, the MARDI research programme should be given every encouragement and the pilot projects recommended should be brought to the notice of interested participants.

1.13.4 The Management of Development

To enable the Development Authority to handle the increased responsibility and volume of work now at hand, it is recommended that the organisation of the LKTT be expanded. Four Divisions are proposed (Table 1.14) under the General Manager to handle Administration and Finance, Planning and Evaluation, Implementation and Technical matters. Ten senior appointments will have to be made, the most immediate need being for a Town Planner, Assistant Manager Projects Section, Senior Engineer and an Agriculturalist. The emphasis should be on timely implementation of all components of the development programme. Many Government departments, public sector agencies and private companies will be involved. They should all combine to support the LKTT in its task of making Trengganu Tengah a success.

1.14 Economic Analysis

1.14.1 Agricultural Economics

Using the prices for oil palm and rubber from Chapter 8 it is apparent that the economic and financial returns to the various factors of production make oil palm the more attractive investment (Chapter 15). The suggestion is made that there is scope for raising the export duties on palm oil and kernels without discouraging private investors. For rubber, on the other hand, a lowering of the export duty may be necessary to attract private sector investment.

Returns from both crops are relatively insensitive to changes in fertiliser costs while rubber is more sensitive than oil palm to a 20 percent fall in product price.

Analysis of other crops is limited by the absence of reliable data relevant to Trengganu Tengah. If the yields of cocoa and coconuts given in Chapter 8 are realised, the economic returns from both these crops are attractive given maintained margins. There is also potential for vegetable and fruit production although according to the limited data available the gross margin from these crops does not compare favourably with oil palm, cocoa or coconuts. Sago palm may provide an additional income from land unsuitable for other agricultural or forestry use.

1.14.2 Forestry Economics

In spite of the current downturn in the world market for timber, long term prospects for Malaysian sawnwood and manufactured products are considered good. The decision on whether to delay agricultural development because of short term fluctuations in the price of timber depends on several factors. In general a delay is only justified on economic grounds if there is a high probability that log prices will rise in the near future.

Total output of timber from the area falls rapidly from 1977 as the agricultural areas are cleared. However, with the development of the Dungun wood-based industrial complex the proportion of output processed in Trengganu Tengah will rise considerably, accounting for 55 percent of log production in 1990 and with the proportion of value added from processing increasing over the development period, total revenue falls at a slower rate (Table 1.15).

Table 1.15 Output and Revenue, Forest Sector, 1975 – 1990

	1975	1980	1985	1990
Total output logs '000 tons	491	216	175	164
Revenue from log sales \$'000	44,190	15,390	7,650	6,660
Revenue from sawnwood \$'000	Nil	7,830	16,200	16,200
Total Revenue \$'000	44,190	23,220	23,850	22,860

Source: Table 15.22

In assessing the investment programme for forestry, the Consultants have considered the Dungun Complex only. The Kemaman Complex plant and all but one of the existing sawmills are outside Trengganu Tengah. Because we have been unable to see any details of the current proposals for the Dungun Complex financial projections are based on those for a low cost basic sawmill unit considered suitable for the area. Total capital investment from 1976 to 1981 is estimated to be \$11.4 million. The proposed complex will provide employment for 465 people by 1985.

State revenue from timber will decline from a peak of \$7.8 million in 1976 to a steady \$2.2 million per annum after 1986.

1.14.3 Industrial Economics

The proposal for centralising three large palm oil mills in Trengganu Tengah will result in a total saving in capital cost of approximately \$35 million during the development period. This saving is considerable when compared to the total estimated investment in all processing facilities of \$89 million and represents a 28 percent reduction in regional industrial capital costs.

1.14.4 The Investment Programme

The development of Trengganu Tengah will require substantial investment (Table 1.16), over half of which will be spent in the period 1975 - 80. The heavy programme in these early years covers land clearance, roads, housing and processing factories. It is estimated that approximately 78 percent of this total will be public sector investment of which 66 percent will be recoverable expenditure.

The total public sector revenue from duties and taxes on output should cover the annual operating and maintenance costs excluding any loan servicing costs.

TABLE 1.16 General Capital Expenditure to 1980 - 1985 of 1984 Base

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Land clearance	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000
Roads	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000
Housing	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000
Processing factories	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000
Other	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000
Total	50,000	75,000	100,000	125,000	150,000	175,000	200,000	225,000	250,000	275,000	300,000

Table 1.16 Sectoral Capital Expenditure in Trengganu Tengah, 1975 - 1990 at 1974 Prices

Sector	Total Expenditure in Period				Total expenditure 1975-1990
	1975-1980	1981-1985	1986-1990	1975-1990	
	\$'000				
Primary agricultural production ⁽¹⁾					
Oil palm	22,939	4,722	2,736	30,397	
Rubber	968	1,364	522	2,854	
Grass	1,814	-	-	1,814	
Sub-total	25,721	6,086	3,258	35,065	
Agricultural Processing					
Grass					
Oil Palm (ffb)	5,320	-	-	5,320	
Rubber	48,322	24,344	6,942	79,608	
	1,730	840	1,310	3,880	
Sub-total	55,372	25,184	8,252	88,808	
Forestry production and processing					
Public Highways	9,620	1,850	-	11,470	
	65,000	8,000	-	73,000	
Housing: Estate Housing	29,148	14,075	6,580	49,803	
Community Housing	30,492	21,425	24,090	76,007	
Sub-total housing	59,640	35,500	30,670	125,810	
Other infrastructure:					
Urban roads					
Water supply	3,678	2,190	1,890	7,758	
Electricity supply	11,058	5,935	5,555	22,548	
Health services	10,212	5,840	5,200	21,252	
Educational facilities	3,288	1,705	1,240	6,233	
Other community services	5,460	6,965	6,705	19,130	
	3,342	1,175	950	5,467	
Sub-total Infrastructure	37,038	23,810	21,540	82,388	
GRAND TOTAL	252,391	100,430	63,720	416,541	

(1) Excludes the cost of housing which is included under separate heading.
Source: Table 15.31.

1.14.5 Economic Evaluation of the Development Plan

As a result of the considerable investment in primary production in Trengganu Tengah it is estimated that the value of output will rise substantially between 1975 and 1990. Annual gross revenue from the primary sectors (Table 1.17) will by 1990 rise 160 percent over 1975 values at constant 1974 prices.

Table 1.17 Trengganu Tengah: Primary Sector Output, 1975 - 1990 at 1974 Prices

	Gross Output			
	1975	1980	1985	1990
	\$'000			
Agriculture				
Oil palm	42,805	78,332	168,376	176,424
Rubber	1,915	7,822	16,717	24,416
Cocoa and Grass	1,986	11,834	12,559	13,779
Other crops and small farming	4,395	8,422	12,449	16,476
Forestry	44,190	23,220	23,850	22,860
Mining	15,000	15,000	15,000	15,000
TOTAL	110,291	144,630	248,951	268,955

Source: Table 15.36

The adoption of modern inputs and management practices will also lead to fairly high labour productivity by 1990 (Table 1.18).

Table 1.18 Productivity by Sector Developed during the Period 1975 – 1990

	1975	1980	1985	1990
Oil palm production and processing				
Value added (\$'000)	- 13,642	4,068	103,378	115,442
Direct employment	631	4,062	8,943	9,888
Value added per employee \$	-	1,001	11,560	11,675
Rubber production and processing				
Value added (\$'000)	- 1,073	3,060	11,474	17,935
Direct employment	95	1,316	2,687	4,233
Value added per employee \$	-	2,325	4,270	4,237
Logging and Sawmilling				
Value added (\$'000)	-	4,274	9,593	9,683
Direct employment	-	231	465	465
Value added per employee \$	-	18,502	20,630	20,824

Source: Table 15.37

The returns to the factors of production depend on the assumptions made. Returns to labour are higher from logging and sawmilling but the total labour employment is low. Returns to labour are high for oil palm at \$16.50 per manday assuming 10 percent return to capital but excluding duty payments.

Returns to land are far higher from oil palm than from either rubber or timber while returns to capital are acceptable to all three activities after allowing a return to labour of \$6 per day and deducting housing costs. On this basis the return to capital invested in oil palm is 18.0 percent over 25 years, 11.0 percent from rubber over 30 years and 29.0 percent from timber over 15 years.

The development proposed will go some way towards meeting the basic NEP objectives by ensuring an average daily wage of \$6 together with modern housing and a high level of social infrastructure. After allowing for the additional infrastructural costs but excluding the basic infrastructural investment the benefit cost ratio is an acceptable 1 to 1.37 at 10 percent discount indicating a 12 percent rate of return to the additional social capital invested in the region (Table 1.19).

Table 1.19 Net Present Values of Development Costs and Benefits, 1970 – 90

Discount Rate	Benefits			Costs		
	Oil Palm Net Revenue	Rubber Net Revenue	Forestry Net Revenue	Infrastructure Capital Costs	Annual Operating Costs	Net Benefits
	\$'000					
10%	76,429	86	12,731	56,183	8,730	24,333
12%	47,383	-1,809	9,315	48,505	6,947	- 563

Source: Table 15.39;

1.15 The Consultants' Recommendations

1.15.1 Trengganu Tengah Study

The objective of this study has been to provide a guide in planning for the Trengganu Tengah region over the next twenty years (1970 – 1990). The Consultants believe that this Report has fulfilled the requirements of their Terms of Reference in this respect. General guidelines have been delineated and development programmes for each sector have been proposed. These proposals have been incorporated into a phased plan. However, we would emphasise that this Report is a guide only and more detailed study is required in some areas.

The Consultants have regarded the development of Trengganu Tengah as being part of a national programme of development. It would be counter-productive to regard the development area as in competition with other development efforts in the region. To ensure that the overall objectives are met and that current interests do not conflict, it is suggested that priority should be given to coordination of all the development programmes in the east coast region. This is certainly a function of Government at the Federal level.

We believe that our proposals satisfactorily meet the major objectives of the New Economic Policy to the extent that rural incomes are raised, higher levels of housing and social infrastructure are provided and Bumiputra participation is ensured.

1.15.2 Population and Labour

The population pattern and manpower requirements of Trengganu Tengah have been studied in detail. We feel, however, that a sociological study is needed to examine in depth the social and economic incentives necessary to encourage immigration and settlement in the area. The primary purpose of developing areas such as Trengganu Tengah is to improve the quality of life of under-privileged sections of the population. To achieve this it is necessary to have a proper understanding of the aspirations of such people.

1.15.3 Agriculture

Agricultural planning has been based on the information presently available on the natural resources of the area. The Consultants feel that this data, particularly that concerning the soils and terrain of the area, is barely adequate and the proposals put forward must be regarded as subject to further investigation of these aspects.

The proposed programme for agriculture is based on the development of oil palm and rubber in the immediate future while, at the same time, groundwork is laid for the introduction of other crops later on. The importance of MARDI in this respect is emphasised. Opportunities for pilot projects should be offered to suitably qualified investors. To assist in the planning and implementation of the agricultural programme, the Consultants have suggested that the Development Authority should engage an Agriculturalist.

1.15.4 Forestry

Our proposals for forestry development are necessarily of an indicative nature. Previous commitments and lack of information about them have precluded the possibility of more detailed planning. We do not see a conflict of interest between profitable forest exploitation and development of land for agriculture providing that forward planning is conducted rationally and liaison is maintained with the departments concerned. This primarily concerns the LKTT and the State Forest Department.

1.15.5 Industry

Consideration has been given to the range of industrial developments, including foot-loose industries, which might be established in Trengganu Tengah during the development period. No over-riding reasons for the development of foot-loose industries have emerged. The Consultants believe that industrial development in the area will be based on the processing of forest and agricultural produce. Location of the processing plants in the proposed new communities will provide a base for further industrialisation at a later stage. We regard the concept of centralised processing as vital to the success of the settlement pattern and it is strongly recommended that the feasibility study proposed on centralised palm oil milling and further processing should be carried out immediately.

1.15.6 Settlement Pattern

The settlement pattern proposed for Trengganu Tengah is based on the relatively new concept of centralisation. We feel that it is essential to adopt this concept if living standards in the rural sector are to be improved in line with NEP objectives. We foresee some initial opposition to the concept but it should be overcome if control of implementation is assumed at an early stage and good liaison maintained between all parties concerned. This will be a function of the LKTT. For a start, a Master Plan for the proposed settlements should be prepared as soon as possible.

1.15.7 The Role of Public and Private Sectors

In specifying the degree of participation of each sector, the Consultants have used the NEP objectives as guidelines to determine the optimum balance. Development is weighted in favour of the public sector particularly in the fields of land settlement and provision of services. Public sector ownership of other developments is designed to ensure an equitable share of ownership for Bumiputras. The private sector, however, should not be discouraged from bringing to Trengganu Tengah its skills, experience and capital which if invested in the right way will make a great contribution to the prosperity of the region.

1.15.8 Institutional and Implementation Aspects

A central Authority to plan, promote and co-ordinate development in Trengganu Tengah is already in existence — the Lembaga Kemajuan Trengganu Tengah. The Consultants confirm the necessity for such an agency to ensure successful implementation of their proposals and have recommended expansion of the present organisation. The need for coordination with the many other departments and agencies of Government is emphasised. In the early years critical schedules will have to be maintained and certain proposals will have to be implemented firmly but reasonably if objectives are to be met. The Authority should endeavour to locate itself within Trengganu Tengah as early as possible to create an image of total commitment to the development programme.

APPENDIX A

Terms of Reference for the Trengganu Tengah Study

APPENDIX A

TERMS OF REFERENCE FOR TRENGGANU TENGAH REGIONAL PLANNING AND DEVELOPMENT STUDY

1. Introduction

The State of Trengganu is located on the eastern shore of West Malaysia. It has an area of about 5,050 square miles. Trengganu suffers from an economy in which low productivity traditional agriculture predominates and in which there is serious unemployment and under employment. The state of backwardness arises from historical and geographical factors such as distance from growth points, lack of a good port and inadequate infrastructures. Other factors such as small residential population (405,539 in 1970), administrative deficiencies and lack of a supply of trained manpower has been a barrier to new investments in Trengganu.

The State however has good natural resources in the form of large forest reserves, excellent tourist attractions and large acreage of good agricultural land. In order to realize the Government's NEP with respect to Trengganu, the Federal Government has established an Authority called the Lembaga Kemajuan Trengganu Tengah to co-ordinate, oversee and initiate the planning and implementation of the development of Trengganu Tengah.

Trengganu Tengah covers an area of 1.09 million acres being the districts of Kemaman, Dungun and Ulu Trengganu. It is estimated that about 600 thousand acres in the area is capable of Forestry and Agriculture development. Up to now about 306 thousand acres are identified as suitable for high productivity agriculture development.

Recognizing the resources potential of Trengganu Tengah Area and the problems currently facing the Trengganu State such as infrastructure bottleneck, trained manpower and financial deficit, a Study is required to provide the guidelines and plan for action to locate the necessary development activities in the area and effect changes to meet the New Economic Policy.

II. Objective

The major objectives of the Study are as follows:—

- (a) To develop an agricultural settlement pattern based on schemes to be executed by FELDA and other government agencies and the private sector.
- (b) To undertake economic evaluation of alternative policies in regard to the role of the public sector vis-a-vis the private sector in the development of the region, taking into account the important aims of income improvement and distribution, creation of employment and maximising Malay participation.

- (c) To prepare a structure plan for the region taking into account of planned and proposed development so as to maximise the use of present and planned infrastructure including network of feeder roads and other social services.
- (d) To consider other options for diversification of agricultural development, apart from oil palm and rubber and to recommend the initiation of pilot projects either by the private or public sector.
- (e) To identify component projects within the development programme that can be implemented immediately as well as those for which further project preparation work need to be undertaken e.g. feasibility studies etc. prior to execution.

III. Scope of Consulting Services

A. General

1. In the course of this Study, the CONSULTANTS shall take into consideration the National objectives, such as those indicated in the SMP.
2. This Study shall cover the whole area of Trengganu Tengah but assessment of the problem and proposals for accelerating development in the area must be viewed in such a wider context such as the development of the area viz-a-viz the other part of the State, and particularly the development of the area in the regional (East Coast) and national context.
3. This Study shall be based primarily on the analysis and extrapolation of existing data such as:-
 - (1) Dutch Survey Team Report
 - (2) Soil Studies by Department of Agriculture
 - (3) Feasibility study of the Jerangau Jabor road
 - (4) Joint Federal-State Task Force Report
 - (5) Population Census (1970)
 - (6) Data compiled by the State Economic Planning Unit

Collection of new data shall be kept to a minimum level consistent with the nature and objectives of the work required herein.

4. The CONSULTANTS shall perform all technical/administrative studies, economic analysis, financial investigations and related work herein described as required to attain the objectives given. In the conduct of the work the CONSULTANTS shall co-operate with the GOVERNMENT and/or its agencies which will provide the data, services and facilities outlined. The CONSULTANTS shall be solely responsible however for the analysis and interpretation of all data received for their findings, conclusions and recommendations.

5. The CONSULTANTS shall review, sort and index all data, maps and reports made available in the course of Study. Upon completion of this assignment, the CONSULTANTS shall submit these materials to the GOVERNMENT for future use in its regional planning activities.

6. The following topics are to be considered by the CONSULTANTS though these topics need not be necessarily regarded as all inclusive.

i) Development Strategy:

The CONSULTANTS shall forecast the economic prospects for the region taking into account the development in the rest of the economy for the 1974-1990 period. Emphasis shall be given to GOVERNMENT policies regarding:-

- (a) Creation of Employment
- (b) Improvement and Distribution of Income
- (c) Increase in the participation rate of the Bumiputra population in the modern sectors
- (d) Creation of an adequate supply of managerial and technical personnel in all major fields

The CONSULTANTS shall consider what the course of development might be if individual aspects of the GOVERNMENT policy had priority in the development programme i.e. if different "Concepts" of development are followed, the concepts to be considered are:-

- (a) Employment: To maximize employment opportunities in the region and particularly their contribution towards opportunities for Malays.
- (b) Income: To maximize the growth of per capita income over the planning period while at the same time improving its distribution particularly as between Malays and non-Malays.
- (c) Transition: To maximize the diversification of opportunities in both income and employment. This concept examines the role of industrialization and urbanization within the region in providing such diversification and particularly methods of ensuring Malay participation in all aspects of the social and economic community.

2. Role of Private and Public Sector

The CONSULTANTS shall develop a consistent strategy for the future development of the region by both public and private sector. Also examine the relative share each sector should play to achieve the best result. Further the CONSULTANTS shall determine the relative proportion each GOVERNMENT agency shall undertake within the public sector.

3. Population and Labour

The CONSULTANTS shall examine present population structure, work force, employment and manpower situation in the region. Projections shall be made regarding population increase, population structure and manpower availability and requirement to support and sustain development in the region. The projection shall include breakdown of skills required and the number particularly those of the management level. The CONSULTANTS shall ascertain the necessity for the State to embark upon a crash training programme to alleviate any anticipated shortage and to make recommendations accordingly.

4. Settlement Pattern

In the light of this massive settlement of people and their dependents in and around the envisaged projects, develop an orderly plan for the establishment and distribution of urban/town centres complete with the necessary health, educational, social amenities and other physical infrastructural facilities to support a progressive modern community.

The CONSULTANTS shall locate the major centres of population and industrial facilities for processing the agricultural and forestry products.

The objective shall be to minimize total infrastructure development cost to meet the objective of the NEP.

5. Forestry

The CONSULTANTS shall study the present deforestation program and make recommendations for a forest exploitation programme with particular consideration to co-ordinate land clearance programme with the fullest feasible exploitation of timber resources. This would include a deforestation phasing programme to synchronise with the land development programme.

6. Agriculture Diversification

Through appraisal of the status and condition of the land, consultations with GOVERNMENT agencies responsible for human and natural resource development, evaluation and planning, and making use of data available from these sources and other secondary information the CONSULTANTS shall assess the potential for accelerating development in the region through its resources particularly agriculture, agrobased industries, fisheries and forestry.

The CONSULTANTS shall assess the agricultural potential of the region for possible crop diversification and livestock development. As part of the assessment the CONSULTANTS shall review the latest research results and analysis of market prospects, checking recent price projections. The CONSULTANTS shall draw up an agriculture development plan which gives on optimum mix of enterprises.

The CONSULTANTS shall assess the possibility of other industries to be developed within Trengganu Tengah bearing in mind the opening of Jerangau/Jabor (Kuantan) road and the Tanjong Gelang Port.

7. Project Implementation Studies

The CONSULTANTS shall identify a list of high priority projects and with the direction and approval of the GOVERNMENT undertake the preparation of feasibility studies to a stage ready for immediate implementation and in a form suitable for seeking financial assistance from international lending agencies (e.g. ADB, World Bank).

8. Structure Plan

The CONSULTANTS shall relate development in the agricultural sector to a "structure plan" maximizing the use of present and planned infrastructure, including an improved network of feeder roads. The plan shall have a phased programme for development, with projects ranked for implementation within it. The CONSULTANTS shall prepare the phased programme using network technique (PERT/CPM).

9. Institutional and Implementation Aspect of the Plan

The CONSULTANTS shall examine the role and activities of all implementing agencies and ascertain the role each would have to play in implementing the plan. The CONSULTANTS shall also draw up a plan of action for each implementing agencies and the physical and financial input required.

Reports

The CONSULTANTS shall commence work on the Study upon receipt of the Notice to proceed from the GOVERNMENT. The CONSULTANTS shall prepare and submit the following reports in English:

- (i) **An Inception Report** (50 copies to the GOVERNMENT) containing a detailed statement of the CONSULTANTS' proposed study procedures and work schedule, to be submitted within 1 month of the date of the Notice to Proceed;
- (ii) **Interim Report**, giving a summary of the work performed during the reporting period, an outline of the work performed during the reporting period and indicating the percentage of completion of the work under each major subheading of the Terms of Reference, to be submitted within 3 months of the date of the Notice to Proceed (50 copies to the GOVERNMENT);

- (iii) **A Draft Final Report** summarizing all work performed in the study and the findings and recommendations of the CONSULTANTS, including maps, plans and diagrams (50 copies to the GOVERNMENT) not later than 7 months from the date of the Notice to Proceed;
- (iv) **A Final Report** (100 copies) not later than 8 months from the date of the Notice to Proceed.

The reports mentioned in (ii), (iii) and (iv) above shall contain first chapter summarizing all major findings and recommendations of the CONSULTANTS. The Study techniques employed and the calculations of costs and benefits and all economic analysis which support the CONSULTANTS' conclusions shall be made available to the GOVERNMENT in sufficient detail to permit checking of all calculations without supplementary data and to permit updating and adjustment for changes in basic data.

APPENDIX B

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APPENDIX B

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110	- Ditto -	1972	<p>A MARKET ANALYSIS OF MALAYSIAN WOOD PRODUCTS FOD: SF/MAL/72/009 Technical Report 6 Rome</p>
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- 130 INCEPTION REPORT
- 131 INTERIM REPORT
- 132 FISHERIES AND AQUACULTURE: GUIDELINES FOR PLANNING

DISCUSSION PAPERS:—

- 133 AN EXAMINATION OF THE PROSPECTS FOR AGRICULTURAL
DIVERSIFICATION IN TRENGGANU TENGAH
- 134 EVALUATION OF ALTERNATIVE DEVELOPMENT STRATEGIES
- 135 SETTLEMENT PATTERN

ADDENDUM

Ref. No:

<p>136</p> <p>137</p> <p>138</p>	<p>Tang Loon Boon</p> <p>Department of Statistics</p> <p>Ministry of Agriculture and Fisheries</p>	<p>1971</p> <p>1971</p> <p>1973</p>	<p>PRODUCTION COSTS OF VARIOUS AGRICULTURAL COMMODITIES (PRELIMINARY) FAMA, Kuala Lumpur</p> <p>VITAL STATISTICS</p> <p>STATISTICAL DIGEST, WEST MALAYSIA 1971 Kuala Lumpur</p>
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