THE GOVERNMENT OF MALAYSIA
LEMBAGA KEMAJUAN TRENGGANU TENGAH

INTERIM REPORT

TRENGGANU TENGAH REGIONAL PLANNING AND DEVELOPMENT STUDY

HUNTING TECHNICAL SERVICES LIMITED.

THE GOVERNMENT OF MALAYSIA

LEMBAGA KEMAJUAN TRENGGANU TENGAH

I N T E R I M R E P O R T

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HUNTING TECHNICAL SERVICES LTD.
Kuala Trengganu, Malaysia

15th May, 1974

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SECTION I

INTRODUCTION AND SUMMARY

1.1 TERMS OF REFERENCE AND STUDY OBJECTIVES

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INTRODUCTION AND SUMMARY

1.1 TERMS OF REFERENCE AND STUDY OBJECTIVES

Under the terms of the Agreement between the Government of Malaysia and the Trengganu Tengah Development Authority on the one hand and Hunting Technical Services Ltd., England on the other, Hunting Technical Services Ltd. (the Consultants) have undertaken the work of preparing "a guide in planning for the next twenty years" for the region known as Trengganu Tengah.

The final Agreement was signed by both parties at the end of February 1974 but the study is considered to have commenced with effect from 15th February. The Consultants presented their Inception Report on 15th March and this is their second report, presented three months after the start of the Study period.

The principal objective of this study is the preparation of a guide to the planning of integrated development for the Trengganu Tengah area. This area covers about one million acres and comprises one third of the land area of the State of Trengganu. It has been identified as one of the few remaining places in Peninsular Malaysia where there are large tracts of land with potential for agricultural development which have, until recently, remained largely undisturbed.

Having gazetted the Trengganu Tengah area, the Government then appointed a public authority, Lembaga Kemajuan Trengganu Tengah, which has been given the task of planning and supervising the execution of an overall plan for the area. The Consultants have been asked to carry out their present study to assist in formulating this plan and to give advice on certain sectors.

Trengganu Tengah is part of an area which, in the past, has lagged behind the rest of the country in terms of employment opportunities and income levels. There is also considerable under-employment in the rural sectors such as traditional agriculture and coastal fishing. One major objective of this study is to identify areas into which those people presently unemployed

or under-employment can find acceptable opportunities for raising their incomes and standard of living. These opportunities are most likely to be in the agricultural and forestry sectors. To enable the people employed in these sectors to enjoy at least some of the amenities offered by urban living, the study includes the planning of new settlements in such a way as to ensure that the maximum amount of modern infrastructural services are supplied taking into account the economic constraints of such a programme. In this connection, the Consultants are asked to bear in mind the existing and proposed infrastructural developments in and adjacent to the Trengganu Tengah area, in particular the Jerangau-Jabor road and the new port near Kuantan.

The Terms of Reference lay particular emphasis on the objectives of the Government's New Economic Policy (N.E.P.) which aims at the improvement and distribution of incomes and the creation of equal job opportunities for all races in every sector of the economy. It is also the Government's policy that maximum opportunity should be offered to Bumiputras to participate at every level in the implementation of the development plan. With these major policy objectives in mind the Consultants have been asked to pay attention to particular aspects such as; the role of the public and private sectors in development, the analysis of population and manpower in the development area, the opportunities for diversifying agriculture, the phasing of agricultural development with the ongoing logging operations and the role and functions of the development authority and other bodies concerned with planning and implementation in the area.

The Consultants are required to produce their Draft Final Report on 15th September, and, after discussion with the Government, their Final Report on 15th October, 1974.

1.2 SCOPE OF THE INTERIM REPORT

Under the Terms of Reference, the Consultants are required to state in their Interim Report, the amount of work done during the preceding period and the amount of work remaining to be done. This is covered in Sections 7 and 8 of this report. The remaining sections deal with the findings of the Consultants during the last three months. The Consultants' full team has not yet been together in Trengganu and there are thus gaps in some areas where the relevant input has not yet arrived or where time has been too short to permit the preparation of more than a preliminary assessment.

While this report is mainly concerned with summarising the present situation in Trengganu Tengah, it does also offer some tentative suggestions in certain areas and illustrates in some cases how the Consultants see their role in assisting in the preparation of the development plan.

1.3 SUMMARY OF INTERIM REPORT

1.3.1 Resources in Trengganu Tengah

Section 2 of the report contains a review of the resources in the development area.

The land area of Trengganu Tengah is 1,096,840 acres (gazetted area) which represents one third of the State of Trengganu. The eastern side of the area contains most of the land considered to have agricultural potential which has been identified in several surveys of the topography and soils. The western half of the area becomes progressively more mountainous towards the border with Pahang and any land with agricultural potential on this side is mostly in small patches. At present, the development area is mainly under forest which is being cleared in some areas in preparation for large scale agricultural projects. In addition, there are already some large agricultural projects, most of which were established during the last decade. Leaving aside the areas already developed or under development and the alienated land, it is estimated that about 200,000 acres of land potentially suitable for agriculture remain to be developed. Most of this land consists of soils in Classes 2 and 3 according to the Soil Suitability Classification Map.

It is estimated that more than half of the area of Trengganu Tengah will remain under permanent forest, most of it for sustained yield development but some for protective purposes. These areas are either gazetted forest reserves or projected forest reserves and they are nearly all on land in Class 5 which is considered to be quite unsuitable for agriculture. However, there are some areas which, according to the soil reconnaisance survey are in Class 4. Land of this class has been recommended as more suitable for permanent forest. The ultimate designation of these areas (which amount to only 40,000 acres), should be

postponed until the results of the ongoing soil survey in Trengganu Tengah are published in 1975.

Population density within the study area is very low with a 1970 estimate of only 17 persons per sq.mile against 81 per sq. mile for the State as a whole. Population with Trengganu State appears to be growing fast. This may in part be due to inward migration from Kelantan. Although the percentage of the workforce registered as unemployed is fairly low at 3-4 per cent total including unregistered and underemployed has been estimated at 19per cent.

1.3.2 Ongoing Developments and Projects

Section 3 of this report deals with the ongoing developments relating to the project area. It includes a survey of projects within Trengganu Tengah and projects outside the area which may influence the development programme.

Most of the agricultural projects in Trengganu Tengah are large scale developments in both public and private sectors. In the public sector, FELDA has the largest share with more than 50,000 acres developed or being developed for settlement schemes. The other public sector agencies and the private sector are mostly involved with estate type developments. Of the 161,419 acres planted or committed to agricultural crops, 132,740 acres (about 80 per cent) are under oil palm. The remainder is mostly under rubber. The constraints to agriculture in the area imposed by steep topography and heavy seasonal rainfall may allow little alternative to this monocultural system. However, a first step in diversification is the initiation of practical field trials of selected crops and, given the facilities already available in the area for agricultural research, the Consultants strongly recommend that a programme should be prepared for immediate implementation in this field.

The Consultants study of agricultural projects adjacent to Trengganu Tengah was made to assess the technical information available and to obtain an estimate of the number of alternatives open to manpower and other resources which could directly affect the development area. In this connection, the Consultants visited

projects in other districts of Trengganu and in the Kuantan district of Pahang.

In most of the areas designated for agricultural development, logging operations are being carried out. Much of the timber is sent to sawmills near the development area. Operations have not yet begun in the areas designated for the two Forest Industry Complexes in Dungun and Kemaman districts. These two areas cover a total of 300,000 acres.

Apart from agriculture and forestry the other major activity within the region is mining. Since the closure of the Bukit Besi iron ore mine in 1971, only relatively small scale mining operations remain. The principal minerals of economic significance presently known to exist include iron ore, tin and wolframite. The main area of interest for further exploration lies along the Bukit Bundi-Bukit Besi mineral belt.

Activities of importance carried on in areas adjacent to Trengganu Tengah include coastal fishing, tourism and a limited amount of processing and light manufacturing.

Two major infrastructure developments on which work will begin shortly, are the new port at Tanjong Gelang near Kuantan and the Jerangau-Jabor road. The first phase of the port is scheduled to be in use by 1976 and the road project should be completed in 1977. The port will become the focal point for the movement of goods into and out of Trengganu Tengah. The road will be the primary line of communication through the area and its feeder road system will serve the main areas being developed for agriculture.

1.3.3 The analysis of Developments

Section 4 is an analysis of criteria proposed to aid evaluation of projects in the light of specific aims and objectives of the New Economic Policy. It is recommended that particular attention be given to evaluation of projects in terms of their income creation and distribution effects. An example comprising returns from a settler scheme and an estate is given in order to illustrate the differences between evaluation in terms of income generation and income distribution. While an

estate may produce a higher financial rate of return, a settler scheme may result in a higher level of income distributed to labour.

1.3.4 Factors Affecting Development

Section 5 analyses the principal factors affecting development of Trengganu Tengah. The first two sub-sections cover respectively the estimated requirement for labour and the estimated supply both within the region and outside it. There follows a short comment on the overall manpower situation, an indication of financial requirements and sources of funds and finally a review of marketing prospects for existing and proposed crops and products.

Study of labour availability within Trengganu Tengah up to 1990 indicates a substantial shortfall against the estimated requirement up to 1990. It appears, however, that during the period an adequate supply of labour will be available within the states of Trengganu and Kelantan. The problem may well be one of devising adequate incentives to attract sufficient migration into the development area.

At this stage of the study, it is only possible to present an indication of the magnitude of capital investment required to implement certain schemes. The Consultants will need much more information to prepare a detailed estimate of total financial resources required for full implementation. It appears that adequate funds are available for development from a wide variety of sources.

Although any estimate of market prospects for commodities traded internationally must be subject to major qualifications, the outlook for most of the proposed commodities is favourable. A word of caution is thought necessary, however, concerning the prospect for palm oil prices bearing in mind the very fast rate of increase in proposed Malaysian output. The market prospects for other crops, livestock and timber are considered to be favourable.

1.3.5 General Comment on Development

Section 6 contains general comments on development in Trengganu Tengah. The region has remained undeveloped because of unfavourable conditions for most agricultural activities. Lack of infrastructure and generally poor communications has limited settlement and precluded the establishment of industry. The construction of the proposed Jerangau-Jabor road together with the new port at Tanjong Gelang will substantially improve the region's accessibility and therefore its attractions as an agricultural area.

The foremost consideration of development is the incorporation of the New Economic Policy objectives. The Consultants believe that development based on agriculture and primary processing will satisfy these aims through the generation of income and employment. State participation in many schemes ensures a high degree of Bumiputra involvement from the outset.

The phasing of development will be chiefly dictated by the availability of land and labour. Release of forest land for agricultural use depends on the progress of logging operations which in turn is governed partly by the period of logging licences and partly by the speed at which contractors can physically clear areas. Availability of labour affects all aspects of development and is therefore a crucial aspect of this study.

1.3.6 Outline of Work Programme During First Phase of Study

The work programme undertaken by the Consultants is detailed in Section 7.1 of this Report. Although the first phase of the study has received less than 25 per cent of the total input allocated for the study, a considerable amount of information has already been collected by the team members.

The Consultants have extended their knowledge of the region, its problems and its potential through field visits, numerous meetings and discussions and study of relevant reports and other printed materials.

The Agricultural Planner has been able to make an assessment of existing agricultural development schemes and also form an idea of diversification possibilities by visiting existing enterprises in the region. The Forestry Specialist, in the limited time available, has assembled data on the present state of forestry and forest operations relating to the study area. The Infrastructure Specialist made a brief familiarisation visit in which he studied available reports on the region and contributed to decisions on the siting of feeder roads within Trengganu Tengah. The Project Economist has studied the existing developments in the context of the NEP objectives and undertaken initial work on demography within the State in order to ascertain the broad magnitudes involved. The Agricultural Economist has studied ongoing developments and made an initial assessment of marketing prospects for the relevant commodities.

The Consultants have collected a considerable amount of published data connected with the study. They will continue to gather such material during the second phase of the study. They feel that there are certain gaps in the basic data needed for a planning study such as this, particularly with regard to an accurate assessment of the natural resources of the region. Unfortunately, it is not practicable to consider filling these gaps within the study period. The Consultants have made a number of field trips to projects both inside and adjacent to Trengganu Tengah. From these they have collected information and opinions from a number of people engaged in development work directly connected with the study. The Project Manager has continued to make courtesy calls on officials in and around Kuala Trengganu.

3.7 Outline of Work Programme During Second Phase of the Study

The Consultants have been asked to consider the implications of their proposals for development in the light of the economic and social objectives of the Government. With this in mind, the Consultants will place particular emphasis during the second phase of the study on the need to raise the levels of employment and income in Trengganu to a standard comparable with that prevailing in other states in Malaysia.

It is proposed to examine in detail the alternative paths along which development in the region can proceed. Various projects and the means of implementing them will be examined in terms of their efficiency in meeting the principal concepts of employment creation, income generation and the creation of job opportunities.

At the moment, it is felt that there is no serious imbalance between committed public and private sector developments and it now remains to establish their relative roles in completing the development process.

Tentative projections of manpower requirements and availabilities have been made and the Manpower Economist will deal with these in more depth along with the question of skills needed and the training facilities required to provide them. With this information, the Infrastructure Specialist will establish a comprehensive pattern of settlement based upon the final estimates of direct and indirect employment and total population within the region up to 1990. He will take into account the data provided by other team members and experience gained from other settlement schemes. Ultimately, phasing of development will depend on the findings of the Forestry Specialist who will, in the second phase of the study, consider the phasing of agricultural development as affected by logging operations, attempt to clarify the position on forest reserves and consider the possibility of further forest-based industries.

Project proposals presently being studied by LKTT include a number of diversification possibilities and these will be considered in the light of their technical feasibility and social influence on the region. The Consultants feel that diversification in Trengganu Tengah has to be looked at very carefully since the area is not inherently suitable for agriculture in terms of relative productivity. In identifying key projects for immediate implementation, the Consultants will give priority to those projects currently committed and will indicate in a general way how they fall into the overall pattern. The Consultants will indicate projects suitable for immediate implementation and those requiring further study before they are approved by LKTT.

Finally, the Consultants will express the basic development pattern in a structural plan which will take account of the relative roles of the development agencies in general and LKTT in particular. As a guide to this objective, a proposed work programme outlining the responsibilities of the specialist staff and the phased inputs required in the second half of the study is given in Section 8.2.

.4 CONCLUSIONS

The Trengganu Tengah Regional Planning and Development Study differs in several important respects from previous regional studies undertaken in Malaysia. In Trengganu Tengah, the Development Authority (LKTT) has already been set up and at present is actively promoting and supervising development projects in the area. The commitments already made by the Authority cover a considerable area of land and thus the range of choice available to the Consultants to suggest alternative paths of development has been considerably narrowed. Furthermore, unlike studies in other regions, a survey of the physical resources of the area was not required since it is considered that the data already available is adequate. However the basic data available is not in fact as comprehensive as might be desired. Taking into account the commitments already made, the limitations of present data and the brief time spent so far on the study, the following preliminary conclusions have been reached.

More than 500,000 acres of the land in Trengganu Tengah has been classified as having some agricultural potential (land in classes 1 to 4). Of this area, an estimated 200,000 acres remain uncommitted for purposes of planning. In the areas already planted or committed to large scale agricultural projects, more than 80 per cent is committed to oil palm. If this trend continues in the remaining area, the acreage devoted to oil palm in Trengganu Tengah could be at least 10 per cent of the national acreage of this crop by the end of the development period.

The opportunities for introducing other farming enterprises are limited by inherent physical disadvantages. It would thus appear that the future development of Trengganu Tengah is heavily dependent on oil palm. Although this would meet the objectives of employment and income generation it does not directly promote a wide range of job skills. Furthermore, it makes the area vulnerable to changes in world market prices and intensifies the risk of loss through pests and diseases. Therefore, as a form of insurance and an attempt to obtain a broader fulfilment of New Economic Policy objectives a high priority should be given to examining the diversification potential of the area through research work and pilot projects, so that the limits of diversification possibilities can be reasonably established.

Population within the study area is very small and development will require significant inward migration. Initial estimates of population growth within the State of Trengganu up to 1990 and projection of labour availability in Kelantan State indicate that in theory at least, there should be sufficient people available over the long term to satisfy likely developments. In the short term there may however be problems in labour recruitment. The problem of shortage of skilled manpower, particularly at the managerial level, is foreseen as a major obstacle to successful implementation. This aspect and the sociological problems involved in encouraging large scale migration are to be investigated during the second half of the study.

Although the total finance required will be substantial it does not appear at this stage of the study that this will be a constraint to development. The market prospects are good for most commodities likely to be produced within the region although there is need for caution regarding the longer term outlook for palm oil prices.

The actual phasing of development will depend on the timing of logging operations since proposed development cannot begin until they are complete. Considerable emphasis will therefore have to be given in the second part of the study to the problems involved in logging forest areas, in order to estimate the practical rate at which agricultural development can take place.

The implications stemming from these basic conclusions will direct the emphasis of the second part of the study to: diversification possibilities, labour availability, training schemes, settlement patterns and the phasing problems involved in forest clearance. All of these will be incorporated into a socio-economic plan which will be primarily related to the broad objectives of the New Economic Policy.

A C K N O W L E D G E M E N T S

The Consultants wish to acknowledge the help they have received from everyone they have approached in connection with this study. They are particularly grateful for the assistance given to them by the managers and staff of those projects that the Consultants have visited in and adjacent to the Trengganu Tengah area.

SECTION 2

RESOURCES IN TRENGGANU TENGAH

2.1 GENERAL

The description of resources which follows summarises the information so far gathered by the Consultants. This relates to resources within the study area and also to those outside Trengganu Tengah but thought likely to influence development.

As the study area does not coincide with existing administrative boundaries it has been a difficult task to assemble accurate base statistics. For instance, population within the study area includes only a fraction of the administrative districts of Dungun, Kemaman and Ulu Trengganu. There has been some difficulty in estimating the existing use of certain land within the region.

Nevertheless the Consultants believe the section below represents a fair assessment of the major resources at this stage of the study. They would welcome any comments resulting in a more accurate picture of the area.

2.2 LAND RESOURCES

2.2.1 Land Area

The total land area of the Trengganu Tengah Development Area is 1,096,840 acres or about 1,714 square miles. This represents 34 per cent of the total land area of the State of Trengganu. The area is located mainly in the districts of Dungun and Kemaman with a small part of Ulu Trengganu included in the north.

2.2.2 Topography

The eastern boundary of the development area has been drawn to exclude the coastal strip which is characterised by its low lying land and generally poor sandy soils. The coastal strip also contains most of the population of the two districts of Dungun and Kemaman. The eastern half of the development area consists of a series of hill ranges which seldom exceed 750 feet in height and run roughly parallel to the coast. These hill ranges are separated from each other by several flat inland valleys and small river basins. In this area most of the land with potential for agricultural development is to be found.

Further inland and comprising most of the western half of the area, the terrain becomes progressively steeper and mountainous. Along the border with the State of Pahang elevations exceed 4,000 feet. Most of this land is unsuitable for agriculture and has been designated as forest reserve under permanent forest either as protective forest or forest for sustained yield logging operations.

The river systems in the development area consist principally of the Sungei Dungun and Sungei Kemaman and their tributaries. These drain the northern and southern halves of the area respectively. There are two smaller river systems, those of the Sungei Paka and Sungei Kerteh which drain the eastern central part of the area.

The rivers are characterised by a gradual rate of fall along their courses and by a tendency to flood during the monsoon season.

The river systems and the boundaries of the area under study are shown in Map: 1R/2.

2.2.3 Present Land Use

The natural vegetation covering the area consists mainly of virgin tropical forest and at the time of the Present Land Use Survey of Trengganu (Wong 1970), about 90 per cent of the development area was thus classified. Since that time large areas of the forest have been opened for logging operations and there are thus large areas in various stages of deforestation or sustained yield exploitation. At 1970, there were few large scale agricultural activities in the area (the photography on which the report is based was taken in 1966). At present large scale agricultural projects on which crops are already planted or which are under development account for an area of about 160,000 acres. There is an estimated 80,000 acres of alienated land which is mainly situated along the river valleys and associated with the kampung settlements in the area. Much of this land is covered by secondary growth (belukar) indicating a system of shifting cultivation. Some land is under rubber, mostly low productivity seedling trees but in the Jabor Valley there are two Orang Asli reserve areas totalling 2,000 acres which are planted with clonal material. Some land in swampy areas and adjacent to rivers is partly used for seasonal padi production. On the basis of available records, a reasonable assumption is that not more than 20,000 acres of the alienated land is devoted to productive agriculture at the present time. Mining activity in the area covers less than 1,000 acres and is confined mainly to a few small alluvial tin mines in the south. The open-cast iron working at Bukit Besi covered more than 1,000 acres but the mine is now closed and the only activity there is a small alluvial tin operation.

A summary of the present land use including developments in progress is shown in Table 2.1.

TABLE 2.1 EXISTING LAND USE IN TRENGGANU TENGAH

AGRICULTURE		
Estates	102,707	
Settlement Schemes	57,723	
Research Station	989	
Other Alienated Land	80,000	241,419
FORESTRY		
Permanent Forest:		
Productive, projected for sustained yield development	522,000	
Protective	52,000	
Amenity Forest	Nil	
Forest Clearance, for agricultural development	279,421	853,421
OTHER		
Mining, Roads, Settlement Etc.	2,000	2,000
TOTAL		1,096,840

2.4 Land with Agricultural Potential

In order to increase the pace of development in Trengganu, the decision has been made to open up large areas of land with potential for agriculture in the state. The largest of these areas constitutes the Trengganu Tengah Development Area.

The principal basis for planning the land development programme in Trengganu Tengah is a Soil Suitability Classification Map of Trengganu State prepared in 1973 by the Soil Science Division of the Ministry of Agriculture. The Soil Scientists prepared a two miles to one inch map of the State dividing the land into five classes, using the Reconnaissance Soil Survey of Trengganu prepared by Panton in 1958 and additional data gathered on various later occasions. The classes are based on an assessment made of the degree of slope of the land plus the characteristics of the soil.

These two factors considered together give an indication of the development potential of an area. The information on the soils was based on reconnaisance data plus a few more detailed surveys of certain small areas. The slope assessment was not based on ground surveys, but on a study of the contour lines on the 1:63,000 topographical map. The soil scientists warn users of the map about its obvious limitations and say it should only be used for planning purposes. They add that any area to be developed should be referred again to the Department of Agriculture for final approval. The present study, of which this Interim Report is part, must therefore be limited to making recommendations consistent with the basic data presently available. So far as basic information on soils and terrain conditions is concerned this data is certainly not complete and any recommendations on land use made by the Consultants will be subject to confirmation following the publication of the results of the present ongoing soil survey which was started in April. This survey is to be a detailed study of the soils in Trengganu Tengah which are considered to have some potential for agriculture and are at present not developed. They are mostly soils in Classes 2 and 3 and cover a total area of 200,000 acres. The soil survey will be completed in 1975.

The present soil suitability map divides the soils into five main classes. Class I contains the best soils and Class 5 consists almost entirely of land considered completely unsuitable for agriculture, mainly on account of extreme slope (over 20°). Each class is divided into sub-classes according to the various limitations to crop growth that each presents. The map also has attached to it a table showing the potential suitability of each soil class for a given range of crops. The short description of the soil groups, the limitations to crop growth and the crop suitability tables are reproduced for reference (Appendix C).

Using a planimeter the extent of the various soil groups within Trengganu Tengah has been determined and is presented in Table 2.2.

Of the 524,069 acres of land classified as having some agricultural potential (Class 1 to Class 4) 87 per cent falls in Classes 2 and 3 in which the bulk of the agricultural development in Trengganu Tengah has therefore to be sited. The best land, Class 1, is mostly located in the Jabor Valley area and is already developed. The remaining pockets of this land are too small to be considered as viable units in themselves. The Federal Forest Department has proposed recently a permanent forest acreage for the whole state of Trengganu of 1.3 million acres. This figure includes Class 4 and 5 soils.

TABLE 2.2 DISTRIBUTION OF SOIL CLASSES IN TRENGGANU TENGAH

Soil Class	Area (Acres)	% of Sub-Total	% of Total
1G	6,484	32	
1g	13,691	68	
Total Class 1	20,175	100.0	1.8
2G	215,904	81	
2g	1,606	0.5	
2d	49,026	18	
20			
2do	1,606	0.5	
2dn/3d			
Total Class 2	268,142	100.0	24.4
3G	99,285	53	
3d	60,808	33	
3cG	26,504	14	
Total Class 3	186,597	100.0	17.1
4Gc	38,701	79	
4do	10,453	21	
4sd			
Total Class 4	49,154	100.0	4.5
5h	7,443	1.3	
5STP	565,329	98.7	
Total Class 5	572,772	100.0	52.2
GRAND TOTAL	1,096,840		100.0

TABLE 2.3 STATEMENT OF CURRENTLY UNCOMMITTED LAND WITH AGRICULTURAL POTENTIAL WITHIN TRENGGANU TENGAH DEVELOPMENT AREA

1	Gross area (estimated) land with agricultural potential (Class 1 to 4) (See Table 2.2)	524,068
2	Alienated land assumed to be on land with agricultural potential (estimate)	80,000
3	Land already occupied by agricultural projects (See Table 3.2)	83,219
4	Land committed for development starting in 1974 (See Table 3.8)	63,200
5	Land committed to agriculture with no definite starting date (See Table 3.9)	15,000
6	Sub-total - Land under agriculture (2+3+4+5)	241,419
7	Land inside proposed Dungun F.I.C. (estimate)	20,000
8	Land inside Kemaman F.I.C. (estimate)	26,500
9	Land in Bukit Bauk F.R. (estimate)	20,000
10	Sub-total - Land within forestry area (7+8+9)	66,500
11	Isolated pockets of land in inaccessible areas	2,700
12	Land within Chenderong Concession	15,000
13	Sub-total - Land not available for development (11+12)	17,700
14	Net area of land with agricultural potential for planning purposes (1 - (6+10+13))	198,449

The inclusion of Class 4 soils in the permanent forest estate was approved by the State Executive Council in 1972 (Mesyuarat 23, 1972). Areas in Sub-Class 4Gc are mainly involved and the 38,701 acres of this soil type accounts for only 7 per cent of the 524,068 acres of land in Trengganu Tengah classified as having agricultural potential.

Taking the gross area of land in Trengganu Tengah at present considered as having some agricultural potential to be 524,068 acres, certain deductions have to be made for developments which have already taken place. These include land already alienated, land already under agricultural projects, land already firmly (legally) committed by LKTT for development projects, land included in proposed forest reserves and proposed forest industry complexes and land in isolated pockets or inside the Chenderong Concession. The total area of all these deductions as shown in Table 2.3 is 325,619 acres leaving a balance of land still available for possible agricultural development of about 200,000 acres. This is mostly Class 2 and Class 3 land.

2.2.5 Land with Forestry Potential

Reliable area figures for all forest land (Table 2.1) are difficult to come by. This is partly because of uncertainties about future allocations, partly because alterations in gazetted boundaries do not appear to have been gazetted and partly because the maps made available are not always in agreement. The call from Forestry Department Headquarters (1971) for establishment, with security of tenure, of a Permanent Forest Estate along defined lines is too recent for much progress to have been made, but the State Director of Forestry, Trengganu is having the first tentative maps prepared. The projected boundaries will broadly follow the boundaries of Classes 4 and 5 soils except where the area is pre-occupied. The allocation is recognised as subject to revision where more detailed soil survey is required for final determination of suitability for agricultural development. The probable extent is shown in generalised form in Map No: 1R/5. The tentative final figure of 574,000 acres (Tables

2.1 and 2.4) includes the mountainous forests of the Chenderong Concession, for purposes of record. The proportion of Permanent Forest allocated to Protective Forest is arbitrarily based on calculations of the areas (in the existing Forest Reserves) of land above 1,000 feet altitude added to areas shown on the map produced by the applicants for the major forest complex in the Study area. There are, so far, no plans for amenity forests. The area of forest clearance for agricultural development includes recently completed exploitation as well as licence and permit areas under exploitation.

TABLE 2.4 FOREST RESERVES AND THE PROJECTED PERMANENT FOREST ESTATE
Acres

NAME	PRESENT	PROJECTED	AUTHORITY FOR PRESENT AREA
Jerangau	48,500	38,400	Gaz. 27 of 26/11/64 less 7,500 acres outside the Study Area
Besul	27,800	35,200	Gaz. 299 of 10/5/1951
Bukit Bauk	24,937	14,400	28,437 in 1971 Annual Report less 3,500 acres outside
Sungei Nipah	60,768	75,600	Gaz. 406 of 6/12/1973
Cherul	73,900	73,200	Gaz. 143 of 20/5/1941
Jabor	13,170	4,300	Forest Department list (14,400 acres gazetted)
Rasau Kerteh	139,020	39,600	1971 Annual Report
Pasir Raja		110,200	
Jengai		137,700	
Jembalang		200	
Bukit Hangus		4,700	
TOTAL		533,500	
Chenderong		40,500	
GRAND TOTAL		574,000	

2.3 POPULATION AND EMPLOYMENT

2.3.1 Present Population in Trengganu Tengah

Although Trengganu Tengah comprises 54 per cent of the State area the estimated population in 1970 was only 7 per cent of the State total. The population density of Trengganu Tengah in 1970 was thus very low at 17 persons to the square mile. This compares with 81 persons per square mile for the State as a whole.

Table 2.4 gives an estimated breakdown of the population by Mukim in the region as at June 1973. These estimates show considerable discrepancies with the 1970 census for which there is no immediate explanation. They should therefore be treated with caution.

TABLE 2.4 ESTIMATED POPULATION IN TRENGGANU TENGAH

DISTRICT	MUKIM	1970 CENSUS ESTIMATE	1973 ELECTORAL RETURN ESTIMATE
Kemaman	Ulu Chukai (Kg. Ibok)	477 [1]	347
	Tebak	5,364	8,509
	Bundi	766	
	Pasir Semut	1,107	1,502
	Ulu Jabor	1,774	1,780
	SUB-TOTAL	9,488	12,138
Ulu Trengganu	Penghulu Diman	3,897	8,196
		3,897	8,196
Dungun	Jerangau	10,973	9,045
	Besul	809	
	Jengai	831	1,000
	Pasir Raja	818	576
	Ulu Paka and Rasau	733 [1]	2,651
	Kumpal	1,603	1,725
	SUB-TOTAL	15,767	14,997
	T O T A L	29,152	35,331

Sources: 1970 Census estimates (unadjusted) and 1973 Election Commission Office, Kuala Trengganu.

N.B. [1] Indicates figure adjusted according to proportion of Mukim in Trengganu Tengah.

2.3.2 Population Growth

Taking the State as a whole population appears to be growing more rapidly than estimated in the 1968 Regional Economic Development Plan for the State of Trengganu.

Table 2.5 shows the growth in total population as revealed by various census estimates.

TABLE 2.5 POPULATION GROWTH IN TRENGGANU STATE

DISTRICT	1947 CENSUS	1957 CENSUS	1967 ESTIMATE(1)	1970 CENSUS	1973 ESTIMATE(2)
Besut	40,975	53,347	70,320	79,244	86,364
Kuala Trengganu	112,580	124,428	168,840	173,534	235,726
Marang	12,235	14,543	18,140	19,695	24,750
Ulu Trengganu	18,594	22,672	26,130	33,694	38,694
Kemaman	26,623	32,579	41,550	44,903	55,794
Dungun	14,989	30,700	41,850	54,469	51,043
TOTAL	225,996	278,269	366,830	405,539	492,371

	1947 to 1957	1957 to 1967	1967 to 1970	1970 to 1973
Total Increase	+ 52,273	+ 88,561	+ 38,709	+ 86,832

	1947 to 1957	1957 to 1967	1967 to 1970	1970 to 1973
Annual Increase	2.1%	2.8%	3.4%	6.7%

1957 to 1970 2.9%

Annual Increase 1947 to 1970 = 2.6 per cent per year

Sources: (1) 1967 estimate of population from 1968 Regional Economic Development Plan for the State of Trengganu.

(2) 1973 estimate from Election Commission Office, Kuala Trengganu.

The 1968 Regional Economic Development Plan for the State of Trengganu postulated a total population in Trengganu State of 467,000 by 1975. From the estimates for mid-1973 shown in Table 2.5 it would seem that this figure is already substantially exceeded implying a faster rate of natural increase, substantial net immigration or a combination of the two. There is also the possibility that earlier census estimates were below the true level thus distorting estimated growth. For instance, the 1970 census published estimate of 405,539 requires to be raised by 4.2 per cent to allow for initial under recording. Adjustment for this shortfall produces a 'revised' population for Trengganu State for 1970 of 422,669. Based on the Election Office figures the 'apparent' growth in the three years then falls from 6.7 per cent to 5.2 per cent per year. However, even this figure is much too high to be explained other than by substantial immigration into the State.

Assuming a natural growth rate of 3.0 per cent per annum from the 1970 'adjusted' census base of 422,669 gives a 1973 estimated population for Trengganu State of 461,861. This is 30,510 below the 1973 estimate of the Election Commission Office. Although inward migration from other states, notably Kelantan, may have increased in the past three years it is unlikely to have risen by this magnitude. At this stage of the study and pending availability of detailed revised estimates from the Statistics Department in Kuala Lumpur it is proposed to adopt the up-dated 1970 census figures as the basis from which to work.

Projecting the population of the State up to 1990 poses problems in terms of working from doubtful base figures both as to total population and as to composition. Working from the 1973 estimated base of 461,861 and assuming a 2.9 per cent growth up to 1980 produces on estimated population in that year of 564,182. Allowing for a 2.8 per cent growth in the following decade produces on estimated total population in Trengganu State in 1990 of 743,618.

2.3.3 Employment

The existing level of employment within the State is summarised in Table 2.6. Totals of unemployed and underemployed together represented approximately 19 per cent of the registered labour force as at July 1973. These figures are no more than a rough guide to the manpower available for development within Trengganu Tengah as many are likely to be part of extended families living in Kuala Trengganu and unwilling to move into the hinterland unless offered substantial financial inducement.

TABLE 2.6 EMPLOYMENT IN TRENGGANU STATE

	1973	%	1975(Est.)	%
Estimated Total Labour Force	178,500	100.0	190,200	100.0
Number Employed	145,000	81.2	154,450	81.2
Number Underemployed	18,200	10.2	19,400	10.2
Number Unemployed	15,300	8.6	16,400	8.6

Source: State Development Office

No information is available which specifically relates to Trengganu Tengah and it is assumed that in traditional settlements substantial underemployment exists. Taking the stated 1970 population and applying the 1970 Census correction factor of 1.042 for underestimation and assuming 3 per cent per annum natural rate of increase, the 1973 population would be 33,199. Applying a participation rate of 333 per 1000 the total available work force would approximate 11,000 (for projection of work force see Section 5.2).

Information on unemployment by the Department of Labour and Manpower in Kuala Trengganu relates to less than 50 per cent of total underemployed and unemployed as many do not register officially with the employment exchange. For example, the registered unemployed in Trengganu in July, 1973 was 6,440 against the estimate made in Table 2.5 of 15,3000 unemployed and 18,200 underemployed including those unregistered. The official figure thus represented 24 per cent of total estimated unemployed, 25 per cent of estimated underemployed and 19 per cent of all

those theoretically available for employment.

A breakdown of the registered unemployed in February 1974 by employment categery is given in Table 2.7.

TABLE 2.7 ANALYSIS OF REGISTERED JOB APPLICANTS TRENGGANU STATE FEB. 1974

	Pro-fessional	Adminis-tration	Cleri-cal	Sales	Ser-vice	Agri. Fisheries Forest	Pro-duction Transport Labourers	Total
	0	1	2	3	4	5	6	
Total Registered	917	0	783	0	659	620	3215	6194
Total with no previous experience	871	0	753	0	641	577	2249	5091
Those with experience	46	0	30	0	18	43	966	1103
Those under 35 years	533	0	558	0	249	90	598	2028
Those over 35 years	384	0	225	0	410	530	2617	4166

Source: Department of Labour and Manpower Kuala Trengganu.

2.4 EXISTING INFRASTRUCTURE

The present road system in Trengganu Tengah serves only a small part of the area although most potential development areas are accessible through the many logging roads and tracks recently made to facilitate removal of commercial timber. The main government roads consist of one in the north which runs from Ajil to Kuala Dungun via Bukit Besi, the road from Chukai to Kampong Ayer Puteh and a road from Kuantan running north to serve the Jabor Valley area. These roads and the proposed routes of new roads in the area are shown in Map IR/2. According to present knowledge, most projects in the area have to provide their own services so far as sewarage and electricity are concerned. The J.K.R. supplies water to the FELDA projects in Trengganu Tengah but other projects have to provide their own system. There are telephone lines which serve areas along the roads previously described.

2.5 INSTITUTIONS AND PARASTATAL BODIES

2.5.1 General

The Terms of Reference specifically request an examination of the role of public and private organisations in the development of the study area. Any such examination requires an initial appraisal of the existing role of the more important organisations. These are listed below, together with a brief description of their objectives and operations as relating to Trengganu Tengah.

2.5.2 Public Development Agencies in Trengganu

(a) FELDA

The Federal Land Development Authority was set up in 1956 to act as the Federal Government Agency for planning and implementing large-scale rural development schemes for settler families largely in palm oil and rubber. During the past 18 years FELDA has built up diverse and extensive experience in project implementation and is now managing over 500,000 acres throughout Malaysia.

The Authority also has plans to diversify into other enterprises such as sugar cane, cocoa and livestock. As well as planting rubber and oil palm FELDA also undertakes research into and the development of agricultural extension, processing, marketing and credit services and the development of technical and managerial skills.

In Trengganu Tengah, FELDA has five developed or developing settlement schemes with a total area of about 27,000 acres. Of these, one is planted with rubber and the remainder with oil palms. The Authority is starting development this year on two more schemes in the area which will both be planted with oil palms, and will eventually cover a total area of 25,000 acres. This will bring FELDA's total area in Trengganu Tengah to 52,000 acres all of which should be settled by 1980.

(b) FELCRA

The Federal Land Consolidation and Rehabilitation Authority was set up to rehabilitate fringe alienation schemes in Malaysia. In general, FELCRA concentrates on smaller areas than FELDA, and is in the process of establishing Youth Settlement schemes in rural areas. The Authority is currently developing a 5,000 acre Youth Scheme based on oil palms just north of Trengganu Tengah near Kuala Brang. In the development area itself, FELCRA has a 5,000 acre block in Ulu Chukai for development as a Youth Scheme. There is no starting date for this project yet.

(c) RISDA

The Rubber Industry Smallholders Development Authority was set up at the start of 1973 to take over the work of the Rubber Industry Replanting Board and the R.R.I. Smallholders' Advisory Services. The Authority is responsible for the issuing and supervision of replanting grants to smallholders (a smallholding is defined as being an area of less than 100 acres) who receive as much as $900.00 per acre in materials and cash. This can be used for replanting old rubber with approved clonal material or with other crops from an approved list of twelve using modern techniques of planting and fertilization. RISDA

has an extension service to advise farmers on the best methods of planting, cultivation and tapping. The Authority also sets up Group Processing Centres to which smallholders can bring their latex for processing into sheet under the supervision of RISDA technicians, thus getting a better grade than they previously obtained using traditional methods. There are 90 such Group Processing Centres in the State of Trengganu, a few of which are situated in Trengganu Tengah.

A recent extension to RISDA's activities is the replacement of the $900.00 per acre rubber replanting grant with the Block New Planting Schemes. The disadvantage of the old scheme lay in the interruption to smallholders' income during the replanting period. In the new scheme the Authority invests the money as shares in estate type agricultural developments which, once they come into production, assure the shareholders (the smallholders in this case) a steady income during their replanting period and thereafter. Applicants for this type of scheme must have land holdings of less than six acres and must have owned their land prior to 1st January, 1971. In the case of shareholdings in RISDA's New Planting Schemes in Trengganu, preference will be given to natives of the State. However, smallholders in other states are eligible too, and Trengganu residents can likewise get a share in schemes outside their state. The Block New Planting Schemes are to be run on estate lines and the smallholders as shareholders play no part in the management.

In Trengganu, RISDA has three such schemes under development with oil palm. Two are in the Kuala Brang area and together will eventually total more than 10,000 acres. In Trengganu Tengah, the Authority has started development of an area which will eventually cover 25,000 acres.

(d) MRDC

The Malaysian Rubber Development Corporation was set up in 1971 to bring the benefits of new developments in rubber processing to smallholder rubber growers. The Corporation has so far set up eight factories for the production of SMR (Standard Malaysian Rubber) and three factories for production of latex concentrates. The nearest of these factories to Trengganu Tengah and the only one on the east coast so far, is situated in Kuala Brang.

It is making SMR 20 from cup lump, scrap and sheet collected throughout Trengganu and as far afield as Kelantan. Eventually, the Corporation plans to set up similar factories at Jerteh and Kemaman.

The Corporation's factories are expected to run as commercially viable units financing their current cash requirements and paying back the capital cost of their plant.

(e) FAMA

The Federal Agricultural Marketing Authority has been in operation since 1965. It has been actively engaged in promoting padi marketing and has conducted research in the marketing of fish, pepper and coffee. At the moment none of these activities is particularly relevant to present developments within Trengganu Tengah. The proposed credit and marketing scheme for agricultural products will not have much impact on the present development which is in the hands of large established entities with their own marketing expertise.

(f) MARDI

The Malaysian Agricultural Research and Development Institute was set up in 1970 to accelerate applied research work on all agricultural crops other than rubber (which remains the province of the Rubber Research Institute). In that year, MARDI took over a number of agricultural research stations from the Department of Agriculture, one of which is at Jerangau in the Trengganu Tengah Development Area and another at Sungei Baging in Pahang, on the coastal strip just to the east of the development area. *NB on map?*

2.5.3 State Development Agencies

(a) LKTT

Apart from the SEDC, which is part of the National SEDC network, the only specific state development agency is Lembaga Kemajuan Trengganu Tengah (LKTT) the Development Authority for Trengganu Tengah. This was formed in 1973 as a result of the Federal - State joint Task Force Report on Trengganu Tengah in 1972.

At present, the authority has two divisions under the General Manager, namely Project Programming and Evaluation Division and Land and Settlement Pattern Division. There are seven permanent professional staff at the moment and three posts are vacant, those of Engineer, Assistant Director of Survey and Assistant Director of Town and Country Planning. The objectives of the Authority are to promote, evaluate, co-ordinate and supervise the development of the Trengganu Tengah region. A function of the current study is to delineate the role of LKTT in relation to other agencies involved in the development of Trengganu Tengah.

(b) SEDC

The aim of the State Economic Development Corporation is to promote and undertake projects which will contribute to the economic and social progress of the Bumiputras. The primary role envisaged is to promote projects as trustee to the Bumiputra and to ensure that they are being effectively run before being handed over.

The Trengganu State Economic Development Corporation was set up with the aims of attracting industry to the State in order to create employment, the promotion of Bumiputra projects and the increase of state revenue through the promotion of viable projects. At the moment the Corporation is engaged in a wide range of activities including the provision of industrial estates, giving assistance to potential investors and also direct investment through subsidiary companies. In the agricultural sector, SEDC Trengganu has invested directly in a palm oil estate at Sungei Tong to the North of Trengganu Tengah and a rubber estate at Bukit Besi within the project area. Both these projects are described in more detail in Section 3.

2.5.4 Federal Agencies Generally Concerned with Development

(a) MARA

Majlis Amanah Rakyat was set up to help Bumiputras in industry and commerce and establish training schemes. Commercial and industrial advisory services are provided and a major aim is to promote the active participation by Malays and other indigenous people in the capital and securities market. The study of industrial potentialities by UNIDO and FIDA recommended that MARA set up a training institute on the east coast.

(b) MIDFL

Malaysian Industrial Development Finance Ltd. is not a government agency as such as it is owned by shareholders from both public and private sectors including Government. Its function is to provide long term finance to private sector industry including agro-based industries and primary processing. At present its activities in Trengganu are limited.

(c) PERNAS

Perbadanan National Berhad, The National Development Corporation was incorporated as a public company in 1969 and commenced operations in January, 1970. PERNAS has formed seven wholly owned subsidiaries and several joint ventures in various fields. The subsidiary companies cover insurance, construction, trading, property, engineering and securities while joint ventures have been established in mining, containerization, consultancy, hotels and trading.

(d) FIDA

The Federal Industrial Development Authority was established in 1967 to promote industrial activities of government and private organisations. FIDA is reported to be establishing a branch office in Kuantan.

(e) NISIR

The National Institute of Scientific and Industrial Research was recently set up to carry out research on new products and processes.

2.5.5 Other Organisations

(a) The Agricultural Bank

This was set up in 1969 to supervise agricultural credit lines made available from public funds and to moblise savings in the rural sector. As yet there is no large scale activity by the Bank in Trengganu.

(b) Private Organisations

Private sector capital either independently or in conjunction with SEDC has made considerable investments in oil palm and other crops in Trengganu Tengah. Proposed future developments, mostly in oil palm, will also have a substantial private capital element in them.

(c) The Farmers Association of Trengganu

Small farmers, through this organisation, are also taking an active interest in investing in agricultural development including a proposed 10,000 acre oil palm and mixed farming estate in Trengganu Tengah and the fruit farming and canning development being set up by SEDC.

2.5.6 Conclusions

With so many agencies concerned with development some overlapping of function is inevitable although this could be counter productive for regional development. However, at the moment, the main agencies involved in Trengganu Tengah are SEDC and FELDA whose functions are quite distinct. SEDC is concerned with setting up commercially viable estates while FELDA is concerned with farmer settlement. In implementation there is some overlap

between FELDA and FELCRA since they are both promoting settlement schemes although in definition of function and management practice they differ substantially. But as the present role of FELCRA is limited to one youth settlement scheme, no serious duplication or overlap of function is foreseen.

It is our preliminary assessment that the role of LKTT should be carefully considered particularly in relation to SEDC which is the other agency from within the State working on the promotion of state development. Both are expected to achieve Federal and State objectives with regard to income generation and distribution and therefore both are heavily committed in the development process. There is a danger in this situation of a loss of objectivity and clash of interests. We feel that in order to avoid this possibility, LKTT, as a development authority, should be less concerned with direct participation in individual projects and concentrate more on evaluation, promotion, co-ordination and supervision of total development. The role of SEDC would then be that of an active investment agency participating directly in individual projects in the industrial and commercial sectors.

In considering the relative roles of LKTT and other agencies, in the future development of Trengganu Tengah, we feel that there are two important issues. The first is that scarce resources in the form of skilled management should not be wasted in duplication of effort either in the promotion or implementation of development. This can be avoided by a clear delineation of function and responsibility as outlined in the above paragraph. Thus LKTT would be solely responsible for promoting development to the implementation stage. Up to this stage, LKTT would of course work closely with development agencies to discuss problems and seek advice, but the policy decision of when and how to implement should clearly be LKTT's responsibility. Once the decision to implement has been taken, full responsibility should be handed over to the development agency concerned, with LKTT left to play a supervisory and monitoring role.

If LKTT's role is clearly defined in this way, the second major issue of clashes of interpretation can be avoided. Implementation of the New Economic Policy requires a balance to be struck between the demands of economic efficiency and the social

aims of income distribution. Those responsible for implementation of a project are normally pre-occupied with technical problems and tend to define the aims of a project in terms of the technically most efficient solution. Provided LKTT maintains a certain distance from proposed developments it is in the best position to balance the technical requirements with social policy objectives.

It is proposed to give particular attention to this aspect of development implementation and the relative roles the agencies should play in the second part of this study. It is here stressed that the Consultants intend their comments on the role of specific institutions to be taken as no more than independent observations at this stage. They merely wish to emphasise the important distinction between project implementation and regional development planning while also drawing attention to the possibility of poor project execution if scarce management expertise is over extended.

SECTION 3

ONGOING DEVELOPMENTS AND PROJECTS

3.1 AGRICULTURE

3.1.1 General

Agriculture and forestry are the main land-based activities of the population of Trengganu and the neighbouring states of Kelantan and Pahang. Most of the agricultural activities are carried out on smallholdings producing mainly rubber on high ground and padi on the flat lands. In and around the kampongs there are considerable areas of fruit trees, coconuts and vegetable crops. Trengganu has the third largest population of cattle in Malaysia and is an exporter of live animals to other states. These activities are concentrated on the coastal strip and in the wide alluvial plains of the Trengganu and Besut rivers. Irrigation facilities for the production of a dry season rice crop are limited, amounting to only about 10,000 acres in the whole state. Flue-cured virginia tobacco is grown in the dry season on about 4,000 acres of rice lands in Kuala Trengganu and Besut districts. Approximately 3,000 acres of groundnuts are also grown on rice land in the dry season and over half of this area is in the Kuala Brang district. Soya bean is another dry season crop being introduced to Trengganu rice farmers.

The raised beach areas adjacent to the coast consist of poor sandy soils which are suitable only for the growing of cashew and are also planted with coconuts which yield very poorly. The people in these areas are mainly dependent on sea fishing for their livelihood.

Although Trengganu Tengah comprises one third of the land area of the State, it contains only about 7 per cent of the population. There is little smallholder agricultural activity in the area and most of the agricultural activity in Trengganu Tengah consists of large scale estate and settlement projects which account for most of such schemes in the State as a whole.

Furthermore, it is envisaged that most of the future development of agriculture in the area will be on a similar scale involving units of land each of several thousand acres. These schemes will obviously depend on attracting manpower from areas outside Trengganu Tengah and will rely to some extent for management expertise on the experience gained on existing projects in and adjacent to the area. It is thus relevant to review and consider the present status of large scale agricultural projects both in and around Trengganu Tengah. The latter include projects to the north of the area in the northern districts of Trengganu, and to the south of the area, in the district of Kuantan, in Pahang. The location of projects in Trengganu Tengah is shown in Map No: 1R/4 and of the projects adjacent to Trengganu Tengah in Map No: 1R/3. A breakdown of the agricultural projects in Trengganu Tengah by sector, type and crop is shown in Table 3.1.

TABLE 3.1 CLASSIFICATION OF CURRENT AND COMMITTED AGRICULTURAL PROJECTS IN TRENGGANU TENGAH, 1974

	Public	Private	Total
TYPE			
Estate	52,897	49,810	102,707
Settlement Scheme	57,723	-	57,723
Research	989	-	989
TOTAL	111,609	49,810	161,419
CROPS			
Oil Palm	90,240	42,500	132,740
Rubber	20,380	1,671	22,051
Other	989	5,639	6,628
TOTAL	111,609	49,810	161,419

3.1.2. Existing Developments in Trengganu Tengah

A total of 83,219 gross acres is already developed or partly developed by both public and private sectors. Most of this area (62,740 acres) is under oil palm but there are also 22,051 acres under rubber, 2,639 acres under cocoa and a 989 acre research station. Details of these schemes which are summarised in Table 3.2 are as follows.

(a) FELDA Oil Palm Schemes

FELDA has four settlement schemes planted with oil palm in the Trengganu Tengah area. Details are shown in Table ? ?.

Of the three schemes in the north of Trengganu Tengah at Jerangau, the Jerangau and Bukit Bading schemes are fully settled with 1064 settlers. The area originally intended as an orchard (dusun) of two acres per settler, has now been planted to oil palm and is run on estate lines by FELDA using direct labour. The settlers share in the income from this area. FFB is processed at the FELDA mill on Jerangau.

Development of the Jerangau Barat area started this year and should be completed by the end of 1975. This area should provide smallholdings for about 350 settlers on the basis of 10 acre lots.

The Neram I area, in the south of Trengganu Tengah, is being developed and about half the area was planted in 1973. It should be completed this year. The Neram I scheme should provide smallholdings for 600 settlers.

The oil palms at Jerangau and Bukit Bading are growing well on the good (Class 2) soils in the area. Peak yields of nearly 10 tons/acre ffb are expected and the earlier plantings are nearing this level. There is loss of fruit due to collection difficulties in the monsoon season which is also the peak cropping season and at this time field to factory transport is a problem.

Settler income has been high during recent months and in 1973 it averaged about $3,000 per annum after deduction of loan repayments.

TABLE 3.2 DEVELOPED AND PARTIALLY DEVELOPED AGRICULTURAL PROJECTS IN TRENGGANU TENGAH

PUBLIC SECTOR	Crop	Area (Acres) Planted	Total	Type
FELDA				
Jerangau	Oil Palm	6,844	8,405	Settlement Scheme
Bukit Bading	Oil Palm	5,489	5,766	Settlement Scheme
Jerangau Barat	Oil Palm	4,500	4,500	Settlement Scheme
Seberang Tayor	Rubber	1,622	2,483	Settlement Scheme
Neram I	Oil Palm	3,104	6,369	Settlement Scheme
SEDC				
Bukit Besi Estate	Rubber	15,380	17,897	Estate
MARDI				
Jerangau Research Station	Oil Palm Etc.	379	989	Research
Sub-total		37,318	46,409	
PRIVATE SECTOR				
Jerangau Estate	Cocoa	999	1,200	Estate
Landas Estate	Cocoa	980	1,439	Estate
TDMB/NADEFINCO	Oil Palm	24,904	25,000	Estate
Chenderong Royal Concession	Oil Palm	3,000	3,000	Estate
Jabor Valley Estate	Oil Palm	4,500	6,171	Estate
	Rubber	1,600		
Sub-total		35,983	36,810	
TOTAL		73,301	83,219	

TABLE 3.3 FELDA OIL PALM SETTLEMENT SCHEMES IN TRENGGANU TENGAH

Scheme	Phase	Perimeter Area (Acres)	Planted Area (Acres)	Year Planted	Settlement Area (Acres)	No. of Settlers
Jerangau	I	1,205	1,190	1963		148
	II	2,145	1,410	1964		166
	III	1,573	1,395	1966		169
	IV	1,025	834	1967		76
	Reserve	886	815	1971		
	Nucleus	1,271	1,200	1962		
	Kampung	300			300	
	TOTAL	8,405	6,844		300	559
Bukit Bading	I	599	599	1965		71
	II	1,929	1,929	1966		224
	III	1,111	1,110	1967		125
	IV	753	753	1967		85
	Reserve	1,098	1,098	1971		
	Kampung	276			276	
	TOTAL	5,766	5,489		276	505
Jerangau Barat		4,500				
Neram I	IA	2,091	560	1973		
	IB	2,155	1,675	1973		
	IC	2,123	869	1973		
	TOTAL	6,369	3,104			
TOTAL		25,040	15,437		576	1,064

(b) FELDA Seberang Tayor Rubber Settlement Scheme

FELDA has one rubber settlement scheme in Trengganu Tengah at Seberang Tayor in Kemaman district. Details are shown in Table 3.4.

TABLE 3.4 FELDA SEBERANG TAYOR RUBBER SETTLEMENT SCHEME

Phase	Total Area (Acres)	Planted Area (Acres)	Year of Planting	Settlement Area (Acres)	No. of Settlers
I	1,280	865	1963		92
II	928	757	1965		80
Kampung	275			275	
TOTAL	2,483	1,622		275	172

The scheme was slow to start due to poor growth of the trees which were brought into tapping in 1971 and 1972. The present stand is now about 110 trees/acre. There are no serious disease problems but unskilled tapping has led to bark damage. Yields of latex have been running about 40% below estimates so far. The scheme is sited on Class 2 soil and its poor performance so far is hard to justify. It is understood that nearby estates offer alternative employment to some settlers which results in lost tapping days on the scheme and loss of tapping days through rain particularly in December is heavy. Latex is sent to the Kampong Awah MRDC factory in Pahang for processing into SMR.

(c) SEDC Bukit Besi Rubber Estate

This estate has a gross area of 17,897 acres. Details of the development programme are given in Table 3.5.

TABLE 3.5 SEDC BUKIT BESI ESTATE PLANTING PROGRAMME

Year	Area (Acres)	Planting Material
1971	2,680	Budded Stump
1972	3,420	Clonal Stump
1973	4,080	Field Budded
1974	4,600	Field Budded
1975	600	Field Budded
TOTAL	15,380	

The estate development programme is up to schedule. Tapping should start in 1976 and the estate will be fully mature in 1982. The capital cost of the project will be $18.5 million. A rubber factory (probably for SMR) will be built in 1975.

The project is sited mostly on Class 2G and Class 4Gc land. The Class 4 land is very steep, in some areas up to 60° slope. Much of the area has been terraced before planting. It is interesting to note that maps supplied to the estate before development started showed the maximum slopes to be only 25°, whereas after clearing these slopes were found to be at least double this figure. It is possible that similar anomalies will be found elsewhere in the Trengganu Tengah area.

Growth of the rubber is satisfactory. Yields of 1,500 lbs/acre are forecast at maturity taking into account the losses expected due to heavy rainfall in the monsoon season.

At present, most of the area is being developed and maintained by contractors who have about 700 workers there. The estate now employs 164 workers directly. When fully mature the estate is expected to have a labour force of 2,100. It is foreseen that obtaining tappers may be a problem initially and the estate plans to start a tapping school provided a suitable area of rubber can be found and purchased.

One condition of the Federal Government, who made the loan for this project, was that it should be supervised by an agency company during the development stage. Therefore, until

planting is completed in 1975, the General Manager is on secondment from Barlow Boustead. This company is also giving assistance in training the potential divisional managers. There will be four field divisions, each of 3,500 to 4,500 acres and one factory division. Each field division will have, in addition to the manager, an assistant manager, two senior conductors and four junior conductors. Staff positions will therefore number over 45 when the estate is fully planted and production starts. It is interesting to note that with the opening of large projects in Trengganu (such as Bukit Besi and Sungei Tong), Trengganu Malays who have been working in management positions in other states are being attracted back to their home state by the prospects of enhanced position and increased earnings.

(4) MARDI Jerangau Research Station

This research station, situated on the Ajil-Dungun road in the middle of the FELDA oil palm scheme, was started in 1952 by the Department of Agriculture. It was taken over by MARDI in 1970. The total area of the station is 989 acres of which about 380 acres is planted, the remainder is under forest with some swampy areas. Details of the planted area are given in Table 3.6.

TABLE 3.6 MARDI JERANGAU RESEARCH STATION

Crop	Area (Acres)
Oil Palm	281
Cocoa	44
Durian	20
Coconuts	2
Fruit Trees	32
Sub-total	379
Houses, buildings etc.	60
Swamp	156
Unfelled Jungle	394
Sub-total	610
TOTAL	989

There are no research officers on the station at present and it is under the control of a Farm Manager. In addition, there are 12 staff, a permanent labour force of 13 and 49 casual workers. The work of the station consists of recording data on the oil palms and cocoa and maintaining the other crops. Small areas of coffee and tea have been uprooted. Some cocoa is being grown under mature oil palms but although the trees grow well the yield of cocoa is very low which is due to the very heavy shade. All data from the station is sent to MARDI headquarters at Serdang.

This is the only MARDI station in Trengganu and the only agricultural research establishment in the Trengganu Tengah area. It is sited on Class 2 soils which are typical of a large part of the land in the area suitable for agriculture and it is subject to the high rainfall common over most of Trengganu Tengah. It would thus seem to be an ideal proving ground for crops in Trengganu Tengah particularly those about which little is known.

It is understood that MARDI is seeking another, larger site in Trengganu Tengah for a research station but even if this is approved it would be several years before it could be sufficiently developed to provide useful information to agriculturalists in the region. The Jerangau station, however, already has the land, the infrastructure and the basic manpower needed to implement a field research programme and it is highly recommended that the MARDI give urgent consideration to upgrading this station for active research into those crops which seem likely to be of interest in Trengganu Tengah. Information on oil palm and rubber is not needed so much as it is on other tree crops such as fruit trees and cocoa. Research programmes on tree crops, however, take several years to produce useful information. As a start, therefore, it is recommended that work should be commenced on a number of annual crops considered to have potential in the area. This work should emphasise selection of suitable varieties, fertilisation levels and the identification of past and disease problems. Annual crops which have been suggested for Trengganu Tengah include maize, groundnuts, soyabeans and castor oil. Studies could also be made of the soil conservation measures necessary to prevent run-off from cultivated land during the monsoon season.

(e) Jerangau Estate, Landas Estate

These two estates, growing cocoa, are both managed by Harrisons & Crosfield. Jerangau estate was started in 1950 in response to a request by the Government (of Malaya) for information and guidance on the growing of cocoa in the country. The planting material used then was Amelonado from West Africa. After a few years the trees were attacked by "die-back" the cause of which has since been identified as vascular streak fungus. In spite of these indications, Landas Estate was planted in 1956 using the same material. Later on Upper Amazon clones were introduced and more recently bybrid material from Sabah, both of which have shown resistance to "die-back" disease. However, at least half the acreage on the estates is still under Amelonado trees and the average yield is very low. The estates are the only pure stands of cocoa in Peninsular Malaysia (on the west coast it is always planted under coconuts or rubber). The Jerangau/Landas estates are being used as a testing area for the Sabah hybrids to determine their resistance to "die-back".

Although the Jerangau soils are deep and well-drained, they are really too acid for cocoa. A liming trial indicated that this treatment would improve soil conditions but on a wide scale it would be very expensive, especially since suitable calciferous material is not available in Trengganu.

The two estates produce about 300 tons of cocoa a year. Amelonado trees are giving 300 - 400 lbs/acre whereas up to 1000 lbs/acre has been obtained from the mature Upper Amazon and Sabah hybrid trees. On the west coast, yields of up to 1,500 lbs/year are obtained and in conjunction with coconuts, 1,200 lbs cocoa plus 1,300 lbs of copra is a normal yield.

Jerangau and Landas estates have a manager and six field assistants. The permanent labour force consists of 50 males and 40 female workers, 120 casual workers are employed at peak harvesting periods in November-December, when 40 per cent of the total crop is collected.

(f) TDMB/NADEFINCO

The National Development Finance Corporation (NADEFINCO) came to Trengganu in 1966 and was given a grant of land by the State Government totalling 33,000 acres on a 46 years plus 46 years lease, for the planting of oil palms. The estate is now managed by the Trengganu Development Management Berhad (TDMB) and to diversify the shareholding, some of the equity is now held by various insurance companies and other individuals.

The company's land is in several blocks in the Kemaman district near Ayer Puteh. In addition to the land leased from the State Government, TDMB has also planted an area of more than 3,000 acres of oil palms in the Chenderong Concession.

The present planted area is shown in Table 3.7.

TABLE 3.7 TDMB/NADEFINCO OIL PALM ESTATE

Division	Area (Acres)	Year Planted
Ayer Puteh	6,756	1967
Pelantoh	7,106	1968
Tebak	4,542	1969
Sungei Mas	3,500	1970
Sungei Mas	3,000	1971
Chenderong	1,500	1969
Chenderong	1,500	1971
TOTAL	27,904	

The company has a further 10,000 acres in the Rasau - Kerteh area which will fulfil the agreement with the State Government for a total area of 33,000 acres (excluding the Chenderong Concession). There are no immediate plans for the development of this area.

The soils in these areas are mixed Class 2G, Class 3G and some Class 1g. Growth of the palms is satisfactory but some of the land is subject to prolonged flooding and this has resulted in the death of trees from spear rot. The wide area from which fruit has to be collected gives rise to transport problems in the monsoon season and up to 50% of a month's crop has been lost because of the inaccessibility of some areas due to flooding. The completion of the Jerangau-Jabor road will considerably ease the estate's transport problems.

The company has a palm oil mill sited at Padang Kubu in the largest block on the Sungei Terbak. The mill is presently rated at 40 tons/hour ffb but there are provisions to expand it progressively to 80 tons/hour capacity as the area reaches peak production. A kernel oil mill with a capacity of 20 tons/kernels per day is under construction. The company hopes to buy ffb and kernels from nearby estates for processing in their factory.

NADEFINCO have made some trials of various crops other than oil palm, mainly to try and reduce the cost of food to the labour force. Cattle have been grazed under the oil palms but the amount of grazing in a mature area is very small and there is damage to the shallow feeder roots of the palms. A fish pond project is currently going on but the risk of flooding and consequent loss of the fish during the monsoon means that they have to be harvested over a period which is only half that required for optimum growth. Limited areas of maize, groundnuts, musk-melons, tapioca and castor oil have been planted but no long term projects have resulted from these trials. The company has planted about 50 acres with Dwarf Cavendish bananas using seed pieces from Taiwan. This fruit is not acceptable on the local market but is the type required for the export trade.

The estate has five divisions, each with a manager and two or three Field Assistants. There are about 25 junior supervisors for each division. The mill and engineering services are managed by three engineers and two more are to be recruited.

Labour availability is a problem and the company has about 3,000 workers but poor daily turn out results in an overall shortage of labour particularly when other activities such as

padi planting are going on. Some of the labour is housed on the estate, some lives outside and even comes from the nearby FELDA rubber scheme at Seberang Tayor. The estate is not well served by the present road system and it is thus not an attractive work place for those to whom the amenities of town life are important.

(g) Jabor Valley Estate

This estate is owned by Sepang Nilai which is a subsidiary of Highland and Lowlands Company Ltd. and Barlow Boustead are the managing agents. The area totals 6,171 acres of which 1,600 acres is under rubber planted between 1955 and 1964. This area will remain under rubber which will continue to be processed into Michelin sheet in a factory on the estate. Production in 1973 was about 1.6 million lbs. and this is expected to rise slowly to around 2 million lbs/year.

The areas formerly under old rubber are now being planted to oil palm and 1,000 acres planted in 1969 - 1970 are now in production. Final oil palm acreage will be 4,500. In 1973, 1,900 tons ffb was processed at the FELDA Bukit Goh mill in Pahang and the crop for 1974 is estimated to be 4,500 tons ffb. Once the whole area is in production, a small 10 tons/hour mill may be constructed. Peak annual yields of 9½ tons ffb/acre are expected.

The estate is situated on the only large block of Class 1 soil in Trengganu Tengah. It is the Kuantan series volcanic soil which is free draining and of high nutrient status. The free draining nature of the soil can give rise to moisture stress on the higher ground during relatively dry periods but tree crops can root deeply in this soil and in mature crops drought is no problem.

The estate has not experienced labour problems in spite of the proximity of the urban area of Kuantan with its burgeoning industrial sites. The work force totals 389 including factory workers.

In addition to the Manager, there is one Assistant Manager and four Field Conductors.

3.1.3 Agricultural Developments in Trengganu Tengah commencing 1974

An area of 63,200 acres has been committed to agricultural projects starting in 1974 and during the year 16,620 acres will be opened up. These projects are summarised in Table 3.8 and the details are as follows.

(a) FELDA

There are two FELDA settlement schemes, one in the south, Neram II and one in the Rasau - Kerteh area both of which are situated on Class 2G soils. Neram II is currently under felling and will be planted before the 1974/75 monsoon. The first phase of Rasau Kerteh will have a felled area of 6,270 acres of which 5,360 acres will be planted this year. The remainder of Rasau Kerteh will be developed in 1975 and 1976 making a total of three phases and the first phase should come into production in 1978. These two schemes should provide holdings for at least 1,600 settlers on the new basis of 14 acres per settler. It is planned to process the output of the schemes in two new palm oil mills to be erected by FELDA, one in the Neram area and one at Rasau Kerteh.

(b) RISDA

A Group New Planting scheme of 25,000 acres has been established in Ulu Paka. Of this area, 4,000 acres is now being felled for planting with oil palm in October this year. RISDA had hoped to make their Phase I area 6,000 acres, but logging activities held up release of 2,000 acres by the Forestry Department. RISDA hope to complete this project in three phases i.e. by 1976/77 but it may not be possible to do this because of logging operations. The RISDA project is sited on several soil classes. These include about 700 acres of Class 1G, 7,000 acres of Class 2G and the remaining 12,000 acres in approximately equal lots of Class 3G, Class 3d and Class 3cG. They plan to build a palm oil mill in the area.

(c) Private Sector

In the private sector there are two projects starting in 1974. One, Ladang Tenggara, is a 10,000 acres oil palm estate project which will be developed in seven phases, starting with 1,250 acres in 1974. The area will be fully planted by 1981. The project area contains about 7,000 acres of Class 2G soils, but there are two small patches of Class 1G soil which together total less than 1,000 acres. The remainder is Class 3d soil which is hoped can be drained. There are plans for a palm oil mill on the estate.

The other Syarikat Protein Tumbuh-Tumbuhan is a 3,000 acres project located north of Kampong Ayer Puteh. It will be planted to a sorghum/grass hybrid producing a continuous crop which will be processed into grass pellets and leaf protein concentrate in a factory on the estate. The area will be felled and cleared in 1974 and the grass planted in monthly phases during 1975. The project is sited on Class 3G soil.

TABLE 3.8 AGRICULTURAL PROJECTS IN TRENGGANU TENGAH COMMENCING 1974

		Area (Acres)		
PUBLIC SECTOR	Crop	Opening 1974	Prop. Total	Type
FELDA				
Neram II	Oil Palm	5,100	5,200	Settlement Scheme
Rasau Kerteh	Oil Palm	6,270	20,000	Settlement Scheme
RISDA				
Ulu Paka	Oil Palm	4,000	25,000	Estate
PRIVATE SECTOR				
Ladang Tenggara	Oil Palm	1,250	10,000	Estate
Syarikat Protein Tumbuh-Tumbuhan	Grass Protein	Survey	3,000	Estate
Sub-total		1,250	13,000	
TOTAL		16,620	63,200	

1.4 Committed Agricultural Developments in Trengganu Tengah

There are two areas of land in Trengganu Tengah which were committed to development through a long standing agreement between the agencies concerned and the Trengganu State Government. No firm dates have been set for the start of operations in these areas which together total 15,000 acres. Details summarised in Table 3.9 are as follows:

(a) NADEFINCO has an area of 10,000 acres in Rasau Kerteh which is the final phase of their 33,000 acres development of oil palms. One third of this area is on Class 2G soils and the remainder is approximately divided between soil Classes 3G, 3d and 3cG. This land would be developed as a joint venture with SEDC.

(b) FELCRA has 5,000 acres in Ulu Chukai for development as a Youth Scheme based on oil palms. It is understood that the agency is currently short of funds and thus cannot commit itself to a definite starting date for this area. Most of this area is on Class 2G soil with two small patches of 3G and 3cG soils.

TABLE 3.9 COMMITTED AGRICULTURAL DEVELOPMENTS

	Crop	Area (Acres)	Type
SEDC/NADEFINCO			
Rasau Kerteh	Oil Palm *	10,000	Estate
FELCRA			
Ulu Chukai	Oil Palm	5,000	Youth Scheme
TOTAL		15,000	

* Not yet definitely committed to planting oil palm.

3.1.5 Agricultural Development Adjacent to Trengganu Tengah in Trengganu State

In the public sector FELDA have four rubber settlement schemes totalling 9,339 planted acres. SEDC has a 20,500 acre estate planted with oil palm and rubber and 4,300 acres in the Kuala Brang area which has been abandoned after a tapioca planting scheme failed. FELCRA has a 5,000 acre youth scheme under development in Bukit Kapah of which 2,000 acres are being planted to oil palm. RISDA has two group new planting schemes for oil palm with a total projected area of 10,200 acres in the Kuala Brang area. To date 4,880 acres have been cleared prior to planting later this year. The National Livestock Development Authority (MAJUTERNAK) has a beef cattle project at Kuala Brang and 1,200 out of a total of 5,000 acres has been cleared of jungle and 600 acres planted with various grasses for grazing. The private sector is represented by only one large estate, the Kretay Estate, which is a long-established enterprise of 7,000 acres planted to rubber, oil palm and coconuts. Details of these schemes are shown in Table 3.10 and brief account of some of these projects follows.

(a) FELDA Rubber Settlement Schemes

The FELDA schemes, Belara, Chalok, Tenang and Chalok Barat are all situated adjacent to the main road north of Kuala Trengganu. It is convenient to consider them together. Details of planted area etc. are shown in Table 3.11.

Three of the schemes, Chalok, Belara and Tenang are settled with a total of 692 settlers plus a few vacant lots. Chalok Barat which was planted between 1970 and 1972 will presumably be opened between 1976 and 1978 and will provide for a further 500 settlers on the present basis of eight acres to a holding or 340 settlers if the holding size is increased to 12 acres as currently proposed for FELDA schemes. The production from the settled schemes is very low and this is reflected in the reported income of the settlers. The settlers do not practice liquid latex collection since they prefer to make only one round of the field daily, collecting cup lump from the previous day.

This is processed at MRDC Kuala Brang factory to a low grade of SMR (SMR 20). The low grade obtained is largely due to a high level of contamination with bark, sand etc. of the field latex before it coagulates. The poor quality of rubber produced reduces the return to the farmer which increases the burden of loan repayment. To avoid repayment of their loans, some settlers are now selling their rubber to outside dealers rather than through FELDA.

The two acre dusun lots are not planted to any crop and the general appearance of these schemes suggests that the settlers are only devoting approximately 50 per cent of their time to working their holdings with a consequently disappointing return to themselves and the scheme as a whole. It is understood that the situation on these rubber schemes is peculiar to this particular area.

(b) SEDC Sungei Tong Oil Palm and Rubber Estate

Sungei Tong Estate was started in 1965 and was originally planned to be planted solely with oil palms. However, it was found that some areas of the land available were unsuitable for this crop and rubber was planted instead. The planted acreage of oil palm is now 16,000 acres and of rubber 4,500 acres. The SEDC would like to find a further 5,000 acres for additional oil palm area. The oil palms are yielding satisfactorily taking into account the limitations imposed by the high rainfall in the area. The rubber division was planted in 1970 and 1971 and has not yet been opened.

There is a modern palm oil mill on the estate which has a present rated capacity of 30 tons/hour ffb. The mill buildings are designed to allow future expansion to double the present capacity. When the rubber area comes into production it is planned to process the latex in a SMR factory to be built at the SEDC Bukit Besi estate.

So far the estate has experienced no difficulty in obtaining labour, possibly because the proximity of Sungei Tong to Kuala Trengganu assures estate workers of access to urban facilities during their leisure time. However, the management

is finding difficulty in getting labour to work a twenty-five day month and fifteen days is the reported norm for a field worker. When all areas are in production, the estimated labour force will be as follows: 1,600 on oil palm, 560 on rubber and 60 in the oil mill. Management is broken down into divisional units with four oil palm divisions, one rubber division and one factory division. The divisions are to be given considerable autonomy and it is planned that the group manager should be located in Kuala Trengganu. Each field division will have two Assistant Managers and between six and eight Field Assistants/ Conductors. The mill will have an Assistant Manager and the necessary technicians. There will, therefore, be more than 40 management positions on the estate when it is in full production.

The SEDC area of 4,300 acres in Kuala Brang for the tapioca project was abandoned after 500 acres had been planted. There are so far no immediate plans to develop this area.

(c) FELCRA Youth Scheme, Bukit Kapah

This project is 8 miles west of Kuala Brang across the Sungei Trengganu. It is proposed to plant 5,000 acres with oil palms and to date about 2,000 acres have been cleared and partially planted. There are obviously considerable delays on this project because the nursery contains polybag seedlings at least two years old and maintenance of the planted area appears to be behind schedule. Land currently being cleared includes several areas with slopes up to 60° and it would appear that this scheme is facing considerable difficulties in implementation.

(d) RISDA Group New Planting Scheme

There are two schemes in the Kuala Brang area, Sungei Gawi and Gerdong, which together will form a total proposed development of 10,200 acres of oil palms run on an estate basis. So far an area of 4,000 acres has been cleared for planting at Sungei Gawi and a nursery has been established for planting later this year while at Gerdong, 880 acres has been cleared. The two projects are expected to provide employment for about 1,000 workers when all the palms come into production. The Consultants have not yet visited these RISDA projects.

(e) National Livestock Development Authority, Kuala Brang

This project is situated five miles south of Kuala Brang, on the Sungei Brang. It has a total area of 5,000 acres of which 1,200 acres was cleared of jungle in 1973 and work is in progress on clearing a further 1,300 acres this year. Six hundred acres have been planted with various grasses using seed and vegetative planting material and it is hoped to have a total of 2,500 acres planted by the end of 1974.

In February this year, five Braford bulls from Australia were brought in together with 88 Hereford x Brahman heifers. Local stock totalling 128 head of Local Indian Dairy and Kedah Kelantan cattle have also been introduced to the scheme. One of the bulls had to be destroyed after it was attacked by a tiger and two cows were killed in the same attack.

This is a very long term project and the ultimate aim is to build up a breeding herd of 3,000 cows using artificial insemination to cross the imported breeds with local breeds. The offspring will be sold as breeding stock and any surplus will go to the beef market.

The area is proving difficult to develop since it is largely covered with partially logged forest and has considerable areas of swamp land. Clearing is done by bulldozer and since some of the slopes now revealed are up to 50°, soil erosion is likely to be a serious problem. Clearing costs are likely to be at least $500/acre since the project is using its own bulldozers (D6 or equivalent) and the operators are not very experienced. Following clearing and burning, the land is cultivated with a rotary tiller and then seeded.

The pasture grasses seem to be growing well but no areas have been subject to prolonged grazing yet. In the monsoon season, much of the area is subject to flooding for days at a time and the stock will have to be moved to higher ground and fed preserved fodder at such times. The project is an excellent practical example of the difficulties likely to be encountered on cattle projects in Trengganu and it should be closely watched by intending entrepreneurs in this field.

(f) Kertay Estate

This is an old estate situated near Kerteh midway between Dungun and Kemaman. It was originally planted with 1,500 acres of coconuts and 4,000 acres of rubber. The coconut area has been abandoned since the trees, which are planted on the coastal sands are very old and are yielding very few nuts. The rubber area contains 1,500 acres of old trees which are being replaced with oil palm. At present, approximately 1,500 acres is planted with oil palm up to four years old and a considerable area of land formerly under swamp is being drained for further oil palm planting. The final estimated area under oil palm will be approximately 3,500 acres and under rubber 2,500 acres.

The rubber is processed in a smoked sheet factory on the estate. The oil palm fruit bunches are carried across to the west coast for processing there, since prices for ffb offered by local mills are unsatisfactory.

The estate employs some 550 labourers with 150 casual workers at peak periods. Some of the workers are housed in traditional labour lines on the estate, others live in their own kampongs nearby. There are nine senior staff.

TABLE 3.10 AGRICULTURAL DEVELOPMENTS NORTH OF TRENGGANU TENGAH

PUBLIC SECTOR	Crop	Area (Acres) Planted Area	Total Acres	Type
FELDA				
Tenang	Rubber	1,063	1,501	Settlement Scheme
Chalok	Rubber	2,349	3,284	Settlement Scheme
Chalok Barat	Rubber	4,165	5,159	Settlement Scheme
Belara	Rubber	1,762	2,306	Settlement Scheme
SEDC				
Sungei Tong Estate	Oil Palm	16,000	25,000	Estate
	Rubber	4,500		
Tapoica Project	Tapioca	4,300	4,300	Abandoned
FELCRA				
Bukit Kapah	Oil Palm	2,000	5,000	Youth Scheme
RISDA				
Sungei Gawi	Oil Palm	4,000	4,000	Estate
MAJUTERNAK (National Livestock Development Authority)	Beef Cattle	1,200	5,000	Ranch
SUB-TOTAL		42,219	61,750	
PRIVATE SECTOR				
Kretay Estate	Rubber	4,000	7,000	Estate
	Oil Palm	1,500		
	Coconuts	1,500		
SUB-TOTAL		7,000	7,000	
T O T A L		49,219	68,750	

TABLE 3.11 FELDA RUBBER SETTLEMENT SCHEMES ADJACENT TO TRENGGANU TENGAH

SCHEME	Phase	Perimeter Area (Acres)	Planted Area (Acres)	Year Planted	Settlement Area (Acres)	No. of Settlers
RUBBER						
CHALOK	I	1,218	988	1959		169
	II	1,716	1,316	1963		216
	Kampung	350			350	
	TOTAL	3,284	2,349		350	385
BELARA	I	1,418	1,215	1963		134
	II	597	547	1963		65
	Kampung	291			291	
	TOTAL	2,306	1,762		291	199
TENANG	I	588	557	1962		63
	II	563	506	1971		45
	Kampung	350			350	
	TOTAL	1,501	1,063		350	108
CHALOK BARAT	IA	1,553	1,190	1970		
	IB	1,292	919	1970		
	II	2,314	2,056	1972		
	TOTAL	5,159	4,165			
T O T A L		12,250	9,339		991	692

(Source: FELDA Office, Kuala Trengganu)

3.1.6 Developments in the Kuantan District of Pahang

The projects listed in Table 3.12 are all situated immediately to the south of the Trengganu-Pahang state boundary and north-west of Kuantan. They may, therefore, be expected to have some influence on the Trengganu Tengah area.

(a) FELDA Oil Palm Schemes

There are five settlement schemes already developed and one on which work is scheduled to start this year. Areas and details of phasing are given in Table 3.13.

These schemes have a total planted area of 22,186 acres and at present there are 1,407 settlers. Settlement of the Panching Timor scheme has been delayed because the housing is not yet completed. The scheme provides holdings for a further 230 settlers. When the Bukit Sagu scheme comes into production (presumably in 1979) it will provide places for another 2,000 settlers (on the basis of 10 acre holdings). All these schemes are served by a FELDA oil palm mill at Bukit Goh which is at present rated at 45 tons/hour FFB. This mill also processes fresh fruit bunches (ffb) from the nearby Jabor Valley Estate which is replacing much of its rubber with oil palm.

(b) LKPP Pahang

The Lembaga Kemajuan Perusahaan Pertanian, Negeri Pahang (Agricultural Industries Corporation) has two schemes in the north Kuantan area.

The Sungei Charu Settlement Scheme is a project for the settlement of smallholders who became unemployed because of the closure of mines in Pahang. The total area is projected at 5,000 acres. 500 acres was planted to rubber in 1971 and settled in 8 acre lots.

Bukit Goh Youth Scheme is projected to cover 2,500 acres of which 500 acres in 1969 and 1,000 acres in 1971 have been planted so far. The palms are now in production and 127 youths are settled on the scheme. The ffb is processed at the FELDA mill at Bukit Goh.

The Consultants have not yet visited these projects in Pahang and the information above was obtained from the FELDA and LKPP offices in Kuantan.

TABLE 3.12 AGRICULTURAL DEVELOPMENTS IN THE KUANTAN DISTRICT OF PAHANG

PUBLIC SECTOR	Crop	Area (Acres) Planted	Total	Type
FELDA				
Bukit Kuantan	Oil Palm	4,876	5,348	Settlement Scheme
Bukit Goh	Oil Palm	7,737	8,574	Settlement Scheme
Panching Utara	Oil Palm	4,102	4,553	Settlement Scheme
Panching Selatan	Oil Palm	3,171	3,721	Settlement Scheme
Panching Timor	Oil Palm	2,300	2,697	Settlement Scheme
Bukit Sagu	Oil Palm		2,560	Settlement Scheme
SUB-TOTAL	Oil Palm	22,186	27,453	
LKPP Pahang				
Sungei Charu	Rubber	500	5,000	Settlement Scheme
Bukit Goh	Oil Palm	1,500	2,500	Youth Scheme
SUB-TOTAL		2,000	7,500	
T O T A L		24,186	34,953	

TABLE 3.13 FELDA OIL PALM SETTLEMENT SCHEMES IN DISTRICT OF KUANTAN, PAHANG

SCHEME	Phase	Perimeter Area (Acres)	Planted Area (Acres)	Year Planted	No. of Settlers
Bukit Kuantan	I	4,028	3,592	1969	350
	II	1,320	1,284	1969	
	Total	5,348	4,876		
Bukit Goh	I	5,281	5,062	1968	535
	II	1,613	1,484	1969	
	III	1,173	684	1970	
	Ext.	507	507	1973	
	Total	8,574	7,737		
Panching Utara	I	3,638	3,238	1968	249
	II	915	864	1968	
Panching Selatan	I	3,721	3,171	1968	273
Panching Timor	I	2,697	2,300	1969	
Bukit Sagu		2,560		To be developed in 1974/75	
T O T A L		27,453	22,186		1,407

Source: FELDA Regional Office, Kuantan

3.2 FORESTRY

Of the 522,000 acres of proposed permanent forest for exploitation under sustained yield, 250,000 acres are earmarked by the State Government for a complex centred on Dungun and 50,000 acres for one centred on Kemaman. Both are expected to be worked under the new Bicyclic Felling System. The first has been the subject of a feasibility study for a forest exploitation, wood-working, pulp and paper complex by the State Enterprise For Foreign Trade, Bucharest, Romania. A final feasibility study has been promised. The area covers forest regarded as productive in Pasir Raja and Jengai proposed Forest Reserves and (except for relatively small areas already under Agreement) Jerangau and Besul Forest Reserves and proposed extensions. The second complex has been allocated to Pesama Timber Corporation Sdn. Bhd.: a firm comprising an amalgamation of the S.E.D.C. and Mahawangsa Holdings Sdn. Bhd., a private company. One has direct and the other indirect experience in logging but neither has experience in industrial development. The framework of the proposal is still incomplete and there is said to be difficulty in finding 50,000 acres of productive forest in Cherul Forest Reserve for sustained yield exploitation without including a considerable area of Class 3 land. The difficulty may be one merely of mapping: the area of Cherul Forest Reserve according to gazette notification 143 of 20/5/41 is 75,900 acres but on maps made available it is 92,500 acres.

For two decades Forest Development in the State of Peninsular Malaysia has been theoretically controlled by State working plans. The first for Trengganu was for the period 1958 to 1962 and the second for the period 1965 to 1974. Working plans are intended to ensure continuity of policy; but situations change so rapidly that plans tend to become out of date soon after they are written: the current plan for Trengganu is no exception. In such circumstances carefully planned control forms become useless and difficulties are multiplied when revision attempts are made. The present revision due, according to the plan, to begin in January 1974 has not yet begun.

When the current working plan was written the accepted rotation for sustained yield was seventy years, based on figures for growth going back to the early years of the present century. The silvicultural basis was the internationally known Malayan Uniform System going back to the discovery, after the war, that

clear felling of all trees in a well stocked Forest Reserve was followed by rich forest regeneration. The new system now being adopted looks forward as far as two felling cycles of twenty-five years each and has been named the Bicyclic Felling System. The basic data deemed to justify the change has not been published nor given to the Consultants to study. The first yield plots to test the theory have only been started this year. Some arguments for introducing polycyclic fellings in countries with similar tropical high forest have been based on fallacies and none of the published experimental evidence encourages belief in the probability of success.

In the remainder of the forest estate as at present established there are 14 agreements for sawmill owners and two for non-sawmill owners for varying areas of some 2,000 to 20,000 acres. Periods are normally for ten years with option for renewal. Where these are located in areas for agricultural development they can limit the rate of progress. All the sawmills except two are situated near the coast outside the study area. The total number of current permits (Forest Reserves) is 69 and current licences, (State Land) 115.

3.3 OTHER DEVELOPMENTS

Although development within Trengganu Tengah relates primarily to Agriculture and Forestry it is also necessary to outline other relevant activities both inside and outside the region.

Within the region the only major activity not already covered under the Agriculture and Forestry sections is Mining. Outside the region, but in adjacent areas activities include, fishing, tourism and various processing and small scale manufacturing enterprises.

3.3.1 Mining

(a) Bukit Besi

Until its closure in 1971 the Bukit Besi iron-ore mine was the most important single revenue producing enterprise in the State with an annual production of over 3 million tons. The former

operators of the mine, Eastern Mining & Metals Company Sdn. Bhd. (EMMCO) have indicated remaining reserves of 92,000 tons high grade iron-ore and 366,000 tons of low grade iron ore[1]. Further large scale mining is currently uneconomic because of the reported high sulphur content and thickness of over - burden. There is presently some limited activity at the site by another Company engaged in the extraction of tin deposits. At the end of 1970 estimated reserves were 900,000 tons of tin tailings averaging 0.6 per cent. tin and 136,000 tons of lode material averaging 1.0 per cent. tin.

(b) Other Areas

Iron-Ore

Reserves at Machang Satahun are estimated at 328,000 tons (57% Fe). Other areas prospected in Kemaman show Reserves of 704,000 tons of iron-ore at Kemasik (55% to 62% Fe), 250,000 tons of iron-ore at Kampong Chenoh (54% Fe) and 318,000 tons of iron ore at Kampong Kongsi (50% - 65% Fe). Small deposits have been discovered in other areas.

Tin

The Bundi Area appears to have potentially valuable tin deposits and the 1972 geological Survey Report recommends more detailed mapping and exploration of this area. Tin is also associated with the Sungei Ayam, Sungei Telum and Sungei Angka areas.

Tungsten

Limited quantities of wolframite have been mined at Bukit Lentor and further mapping of this area is recommended.

Other Minerals

These include small occurences of ilmenite & Bauxite near Kuala Brang, and graphite in Chukai. Deposits of bauxite, molybdenite, silver, gold and bismuth are also known to exist. Limestone deposits at Bukit Besi and Bukit Biwah may be adequate

[1] N.B. Geological Survey Report MX (G) 4/1972

to meet local agricultural requirements. Adequate supplies of granitic rock and laterite are available for road making purposes.

The main recommendations of the geological Survey Report are that future exploration be carried out along the Bukit Bundi - Bukit Besi belt which has potential deposits of tin, tungsten and iron ore. At this stage it appears that all deposits are fairly small although improvements in communications may stimulate more extensive prospecting which in turn may reveal greater mineral resources within the region. From information presently available it is not possible to quantify the employment effect of mining development in the future.

3.3.2 Fisheries

Fishing is an important ectivity in Trengganu State with centres at Kuala Trengganu, Besut, Dungun and Kemaman. In 1970 it was estimated that 10,778 Fishermen were employed in these 4 centres landing 355,000 pikuls of fish . Approximately 60 per cent of the catch was exported by road to Singapore, Kuala Lumpur and other Consuming Centres within West Malaysia.

Although some trial work is being undertaken on inland fish ponds at Padang Kubu (NADEFINCO) the major problems associated with heavy monsoonal rainfall are not a good augury for the future. It is however recommended that a close watch is kept on this trial as successful inland fisheries would be able to provide the local population with an improved diet and also a useful additional cash income.

3.3.3 Tourism

Although the State possesses considerable potential for tourists the development of the industry has been slow. This has been due in the past to the relatively poor communications and infrastructure while heavy rains during the November, December and January period are a further inhibiting factor. The State has an excellent coastal belt with obvious tourist potential, but the hinterland lacks obvious attractions for the majority of tourists.

Within Trengganu Tengah the present tourist possibilities are limited because of poor access and it is not likely that

tourism will have a mojor potential in the area before 1990.

3.3.4 Processing and Manufacturing

Primary processing operations for oil palm, rubber and timber have been dealt with in section 3. As yet there are no major industrial activities, other than those already described, within Trengganu Tengah.

There has only been limited industrial development in Trengganu State, relating mainly to food manufacturing, such as bread, biscuits, soft drinks, and other perishable goods which is situated in and around Kuala Trengganu.

SEDC are planning an industrial Estate near the Kuala Trengganu airport with the aims of attracting light industry to the area. They are also planning a fish cannery and groundnut processing plant at Kampong Kuala Ibai south of Kuala Trengganu.

Other major developments which will exert a direct or indirect influence on Trengganu Tengah include the proposed Port Complex at Kuantan and the possible hydro electric scheme on the Sungai Trengganu.

N.B.[1] Industrial potentialities Study of Kelantan and Trengganu - UNIDO/FIDA 1972.

3.4 INFRASTRUCTURAL DEVELOPMENT

3.4.1 General

The development of the basic infrastructure in and around Trengganu Tengah is one of the corner stones of the development programme for the area. The east coast states of Kelantan, Trengganu and the eastern part of Pahang have suffered in the past from the lack of coastal port facilities and the inadequacy of their road systems, particularly during the monsoon season. Two major infrastructure developments have been planned to remove these bottlenecks to development and they are both vital to the successful build up of development activities in Trengganu Tengah.

The first is the proposed port at Kuantan and the second is the Jerangau-Jabor trunk road and its related feeder roads.

3.4.2 Kuantan Port

Following a detailed study[1] of the economic factors and on site investigation, it has been decided to develop the East Coast Port at Tanjong Gelang near the town of Kuantan in Pahang. This port will serve the east coast states in general and the development areas of Pahang Tenggara, Jengka Triangle and Trengganu Tengah in particular. If the building programme proceeds on time, the first phase of the port, including the facilities for the ocean shipment of palm oil should be ready for use in 1976.

The port will be able to handle ships up to 35,000 DWT and 34 feet loaded draught and the amount of cargo handled annually is estimated to increase from 1,330,000 tons in 1976 to 3,200,000 tons in 1990. It is anticipated that liquid palm oil products will account for nearly 50 per cent. of this total.

Ultimately, there will be eight general cargo berths and one dolphin berth for palm oil shipment. About 500 workers will find employment during the construction phase and the labour force required for cargo handling will increase from about 500 in 1976 to more than 1,200 by 1990. The number of staff employed at the port will increase from 160 to 300 during the same period.

N.B.[1] Kuantan Port Feasibility Study, Bish & Partners, Holland 1973

The port at Tanjong Gelang is located a few miles east of the Trengganu Tengah development area and will be in direct communication with the area through the Jerangau-Jabor road. The influences of this development on Trengganu Tengah will be considerable. Firstly, the direct shipment of products to export markets will eliminate the costs previously incurred when all products had to be transported by coastal vessels or by road before ocean shipment from the west coast ports. Secondly, there should be an equivalent saving in the cost of bulk inputs such as fertilizers. Thirdly, the port will be a major source of employment adjacent to Trengganu Tengah and will no doubt draw on the manpower resources of Trengganu as well as Pahang. Furthermore, it is likely that an industrial area immediately adjacent to the port could become a greater employer of manpower than the port itself.

It is estimated that the Kuantan Port project will cost about $150 million of which about $70 million will be financed by a loan from the Asian Development Bank.

3.4.3 The Jerangau-Jabor Road

Following a detailed study[1] of two possible routes for a major road from Jerangau in the north of Trengganu Tengah to Jabor Valley in the south, it has been decided to adopt the western alignment. This route best serves the current development projects in the area and those areas in which agricultural development is expected to take place in the immediate future. The route of the trunk road and the proposed routes of the feeder roads are shown in Map No:1R/2.

The northern end of the main road will start at the point on the Ajil - Kuala Dungun road where there is a turning to the Bukit Besi mine between the 7th and 8th milestones. It will head south passing through the SEDC Bukit Besi Rubber Estate and the RISDA, Ulu Paka project area. It will then pass through the NADEFINCO oil palm estate and cross the existing Chukai-Ayer Puteh road at Kampong Ayer Puteh. The trunk road will then continue south, crossing the southern divisions of NADEFINCO's oil palm area and part of the newly developed FELDA Neram area. It will follow the eastern boundary of the Jabor Valley Estate and leave the Trengganu Tengah area a few miles north of its southernmost point. The road will

N.B.[1] Feasibility Study Jerangau-Jabor Road. Ove Arup and Partners and Economic Associates 1973.

join the existing east coast main road to make a direct connection with the port site at Tanjong Gelang. The total length of the Jerangau-Jabor trunk road will be about 65 miles.

There are to be nine feeder roads (numbered F1 to F9 on Map No: 1r/2). Feeder road F2 will be a north-east branch off the main road near Kampong Durian Mas approximately 15 miles south of Bukit Besi. It will skirt the Sungei Angka and will continue as F1 along a line parallel to the Sungei Jengai to a point on the Sungei Dungun a mile or two north of the junction between that river and the Sungei Jengai (Kampong Kuala Jengai). At this point the road will connect with a new road at present under construction along the Sungei Dungun from a point upstream of Jerangau. Ultimately, it is foreseen that there will be a crossing of the Sungei Dungun to bring F1 into Mukim Jengai area on the West bank of the river and in the long term, to connect with a road across the country from Pahang.

A mile south of where F2 branches off the main road, another feeder road, F6 branches due east. This road crosses the Rasau Kerteh area and, as F5, it joins the present coast road at a point just south of the town of Paka. North and south from F6/F5 are two more feeder roads, F4 and F3 respectively. F4, to the north will serve the Rasau Valley area currently being developed by FELDA and, to the south, F3 will serve the Kerteh Valley area where NADEFINCO/SEDC have a 10,000 acre development area.

Further south on the main road, at a point about 30 miles south of the Bukit Besi end, there is a feeder road running east. This is F7 which continues as F8 to join the existing Kemasik-Ayer Jernah-Kijal road about 7½ miles from Kemasik. F7 and F8 will serve the Ulu Chukai development area where FELCRA have a committed area for a Youth Scheme.

The southernmost feeder road, F9, will be a south-west branch off the main road at a point just north of its crossing of the Sungei Cherul (approximately 48 miles south of Bukit Besi). This road will serve the Cherul Forest Reserve area in which some of the land may ultimately be released for agricultural development. Its immediate function will be to provide access to the Kemaman Forest Industry Complex area.

Work on the design of the main road and most of the feeder roads is already well advanced. The F9 road was requested only recently, but it is hoped that this can be included in the overall specifications for international tender which should be ready by October, 1974. If the tendering procedure is on schedule, work on the road project should begin in March 1975 and the whole system should be completed by the end of 1977. Contractors will undoubtedly be hindered by the conditions prevailing during the monsoon season which could effectively reduce their working period by several months in each year.

At present most of the development areas in Trengganu Tengah are accessible by existing roads and logging tracks during the drier months of the year. There may be some disruption of these communications during the road construction period. The Lembaga Letrik Negara have indicated that they may construct a main power line along the road to serve the new settlement areas.

The Jerangau-Jabor road system was estimated to cost in the region of $48 million at present prices. It is expected that a major part of the cost will be financed by an international loan.

SECTION 4

ANALYSIS OF DEVELOPMENTS IN TERMS OF N.E.P. OBJECTIVES

4.1 CRITERIA FOR EVALUATION OF PROJECTS AND PROPOSALS

The Terms of Reference state that government policies for the region must emphasise the creation of employment, the raising and wider distribution of income, increasing Bumiputra participation in the modern sector through industrialisation and urbanisation while also ensuring and adequate supply of managerial and technical personnel. With these objectives firmly in mind evaluation methods relating returns to capital employed are clearly insufficient. Additional techniques showing returns to labour and the extent of income distribution are therefore used in this study to assess the acceptibility of the various projects and diversification schemes.

The list below summarises the main criteria adopted. It is considered that the incentive factor is of prime importance in assessing the success of individual schemes. Any analysis of income levels and distribution must also take account of the non-monetary benefits which figure prominently in the lives of many Trengganu citizens.

(a) Employment Generation

A simple guide to the cost of job creation is given by the Capital Cost of each permanent job deriving directly from the relevant schemes.

$$\text{The Capital Cost per worker} = \frac{\text{Total Capital Invested}}{\text{Total No. of Workers Directly Employed}}$$

Ceteris Paribus those schemes with the lowest Capital Cost per worker will be preferred.

(b) Job Opportunities

The opportunity for people to learn new skills and to choose alternative jobs is important. A table showing the percentage distribution of different skills generated by the scheme or project gives an indication of the project benefits in this respect.

In any ranking of alternative projects more weight would then attach to those projects with an even distribution of skills and in-built training schemes. The actual weighting employed must depend upon value judgements regarding the importance to Society of a more broadly based range of skills and education.

(c) Income Generation

Income generation may be related to any chosen input. In terms of the scarce resources of this study it is appropriate to compare projects in relation to the total value added per person employed.

The measure to use would then be:

$$\frac{\text{Gross Value Added (Per Year) On Project}}{\text{Total Number of Persons Directly Employed}}$$

The present value of the return to labour can then be calculated by discounting each year's net revenue after excluding annual costs of all management and labour inputs.

(d) Income Distribution

The gross value added is comprised of returns to capital employed, plus depreciation, plus returns to labour, plus taxes to Government and other agencies.

The measure of distribution of value added is shown by the ratio : gross value added per employee/average gross salary per employee. If policies are to be followed requiring maximum distribution of income then priority should be given

to schemes in which a high percentage of value added is distributed by way of wages and salaries.

(e) Flexibility in Future Planning

Priority should attach to schemes and proposals which retain a high degree of choice as to future production. Highly specific investments should be avoided unless the return is so high that the write-off period is very short (say less than five years).

(f) Economic Evaluation

For purposes of ranking alternative projects it is valid to use the economic rate of return where returns to scarce social capital are the prime concern. Use of shadow prices in calculations allows for "true" returns to the economy even where local market conditions are imperfect. It may well be that employment of shadow pricing for labour in Trengganu Tengah would necessitate use of a wage rate above the existing market rate. To a certain extent the use of labour return calculations eliminates the need for capital return calculations where benefits to labour are the prime consideration.

(g) Financial Rate of Return

The internal rate of return at market prices makes no allowance for benefits or costs external to the project but shows project viability of individual schemes in terms of capital employed.

(h) Balance of Payments Effect

Analysis of those goods and services which are traded outside the region, the State or the Nation, would not appear to be of major importance in this study as foreign exchange is unlikely to be a limiting factor in developing the area. Undue dependence on foreign markets could be a destabilising influence if commodity markets weakened. This aspect is dealt with in greater detail in Section 5.5.

(i) Finance

The sources of finance should be closely examined for all projects with attention given to adequate provision for contingencies. Wherever possible provision should be made for local Bumiputra participation either through savings schemes or equity participation which will help to reduce racial disparities regarding ownership of assets.

(j) Use of Criteria in Overall Evaluation

The choice of criteria for project evaluation must depend upon identifying the scarce resource in terms of which returns are to be assessed. The decision as to whether projects should be evaluated in terms of return to capital or labour must depend on a value judgement concerning the relative importance of policy objectives. In terms of N.E.P. objectives the Consultants favour the use of rate of return to capital calculations together with the estimated returns to labour. Schemes can then be compared in terms of returns to labour and capital and decisions taken on calculated values.

Table 4.1 compares the returns to capital from settler schemes with estate type operations covering oil palm and rubber growing. Returns to capital are higher on the estate type of system for both crops. Reference to Table 4.3 however, indicates that as far as oil palm is concerned the proportion of value added distributed to management and labour is higher on the settler type scheme. The absolute totals are also higher in the case of the FELDA settlement scheme where the return to management and labour is estimated at $214 per acre against $143 for the estate operation.

In all cases major input and output parameters should be tested for sensitivity in order to assess the overall effect of postulated changes in prices and quantities.

TABLE 4.1 ECONOMIC EVALUATION OF ESTATES AND FELDA SETTLER SCHEMES

CLASS I SOILS

Palm Oil

	10,000 Acre Estate	5,800 Acre FELDA Scheme
Internal Rate of Return	13.3%	12.8%
NPV Per Acre at 10 per cent	$ 430	$ 358
Development Cost Per Acre	$1353	$1404
Total Employment at Maturity		
Estate	468	518
Factory	63	36
Planted Acres Per Worker at Maturity	18.1	10 (Per Settler Family)

Rubber with Improved Clones Planted After 1975

	10,000 Acre Estate	5,800 Acre FELDA Scheme
Internal Rate of Return	16.0%	13.7%
NPV Per Acre at 10 per cent	$1287	$ 445
Development Cost Per Acre	$1582	$1732
Total Employment at Maturity		
Estate	1243	728
Factory	105	54
Planted Acres Per Worker at Maturity	6.8	10.0

4.2 EVALUATION IN TERMS OF INCOME GENERATION

Money measurements of growth and progress often present a distorted image because conventional accounting techniques have, as yet, not found a satisfactory method of valuing every human satisfaction in money terms. This is particularly relevant to traditional "subsistence" societies where the cash element of "income" is small and a high value may be placed on leisure, religious, social and political activities and the customary way of life. In fact, the only way in which a money value can be placed on these activities is to try and infer the monetary inducement required by people in these communities to take up full-time employment in the cash economy. It is thus essential when comparing the existing situation with any proposed new development to make due allowance for the non-cash values of a particular community, which must be balanced against the benefits of new developments measured in monetary terms. This inevitably leads to a certain amount of subjective judgement and argument as to what the value of non-cash elements in a particular community is and what weighting should be placed upon it.

It has become apparent, however, in our discussions with employers and those concerned with development in Trengganu Tengah, that higher cash wages are at the moment an insufficient inducement for movement in any great numbers from the coastal strip. In particular, young people with a secondary education would appear to find the definite income and career opportunities offered in the rural sector, less attractive than the probability of finding less remunerative employment in an urban environment.

As population pressure increases and the probability of finding employment decreases these reported attitudes may change over time. But in the initial planning stages the value placed on living within traditional communities must be taken fully into account. As yet there is neither a sufficient sociological information, nor a developed methodology to put this into a formal analysis. However, we intend during our study to discuss the conventional economic analysis measuring the income generation effect of new developments in the light of the strong value which would appear to be attached to living in traditional urban communities in and around Trengganu Tengah.

4.3 EVALUATION IN TERMS OF EMPLOYMENT GENERATION

In many cases capital is the scarce resource limiting development and alternative schemes are evaluated according to the capital cost of creating employment. This measure is included in this study as a guide only. Undue weight should not be attached to this aspect because capital, although not unlimited, does not appear to be the major constraint. Rather it may be that manpower and certain specific types of skilled labour will be limiting factors.

Table 4.2 shows the capital cost of employment for various approved and proposed schemes within the region. It also indicates the employment per acre of land developed.

TABLE 4.2 CAPITAL COST AND EMPLOYMENT ESTIMATES: SELECTED SCHEMES

SCHEME	Estimated Acreage	Estimated Employment	Estimated Capital Cost M$ 000	Acreage Per Person	Capital Cost Per Person
OIL PALM					
FELDA JERANGAU	5,674	599	N/A	10.2[1]	N/A
LADANG TENGGARA	10,000	860	12,500	11.6	14,535
RUBBER					
SEDC BUKIT BESI	15,380	2,100	18,500	7.3[2]	8,810
FELDA SEBERANG TAYOR	1,622	172	N/A	9.4[1]	N/A
GRASS PROCESSING					
SYARIKAT PROTEIN	3,000	62	7,134	48.4	115,065
TIMBER					
DUNGUN COMPLEX	250,000	2,270[3]	81,000[3]	110	35,683

N.B. [1] Per settler and family.

[2] If it is assumed that there are two workers per family the effective acreage almost doubles to 14.5 per family.

[3] Duron: Feasibility Study 1974

4.4 EVALUATION IN TERMS OF INCOME DISTRIBUTION

Making due allowance for the qualifications attaching to money income as mentioned in Section 4.2 it is possible to compare the distribution of revenue as between different land use schemes. This method is illustrated in Table 4.3 which contrasts the distribution of gross value added between a typical settler scheme and an estate. It must here be stressed that the examples given are no more than this as the figures are based on work produced in the Pahang Tenggara study. It must also be made clear that a valid assessment of income distribution requires an analysis of taxation proceeds and returns to capital. It may be that effective distribution of value added could be achieved through estate-type operations employing a significant bonus or share incentive scheme.

Nevertheless analysis along these lines has the merit of comparing all schemes in the light of N.E.P. objectives.

TABLE 4.3 COMPARATIVE DISTRIBUTION OF VALUE ADDED
PERCENTAGE DISTRIBUTION OF GROSS REVENUE ON OIL PALM ESTATES
(PER ACRE)

	Estate Type Operations (10,000 Acres) (Units)	FELDA Scheme Settlers (Units)
Gross Revenue	138	138
Less Material and Services	38	38
GROSS VALUE ADDED	100	100
DISTRIBUTION		
Taxes and Duties	30	10
Management and Labour	22	60
Capital Servicing and Profits	48	30

SECTION 5

FACTORS AFFECTING DEVELOPMENT

5.1 MANPOWER

5.1.1 Total Requirements

The Jerangau-Jabor road feasibility study includes an estimate of both primary and secondary employment for purposes of road traffic analysis. At this stage of the present study these estimates will serve as a general guide to the total population and employment within the region as a whole. As the study develops these initial estimates will be altered, both as to requirements and availability, so that a proposed phasing emerges matching supply and demand as closely as is practicable.

The Jerangau-Jabor study indicates total employment in the region could be 32,000 by 1980, 38,000 by 1985 and 46,000 by 1990. If this figure is compared to the total estimated labour force within the region as outlined in section 2.3.3. there is seen to be a manpower deficit of approximately 22,000 from end 1973 up to 1980. Allowing for natural increase within the region, net immigration of the order of 20,000 would be required by 1980, 25,000 by 1985 and 32,000 by 1990. Assuming a participation rate of 333 per 1000 this implies total immigration of the order of 60,000 by 1980, 75,000 by 1985 and 96,000 by 1990.

5.1.2 Labour Requirements According to Skill

The identification of labour requirements according to skill presupposes a detailed knowledge of all projects within the region. At this stage only a broad assessment is possible through analysis of committed schemes and firm proposals.

An average employment rate on a palm oil estate is one worker to ten acres with field workers accounting for 96 per cent of the total work force and management about 4 per cent. Processing plants require a higher percentage of skilled and semi-skilled workers and management, but employ relatively few people per unit. A rubber estate employs a higher ratio

of labour per acre with a greater degree of skill and the management percentage is approximately the same as for oil palm. On present committed and proposed developments which are largely oil palm the future demand will therefore be largely for unskilled and semi-skilled labour.

5.1.3 Phased Demand for Labour

The phased demand for labour to implement committed developments shown in Table 5.1 has to be compared with Table 5.2 indicating labour availability in Trengganu Tengah. It is too early in the study to draw any definite conclusion from these figures. They are merely intended to serve as a guide to the requirements for further investigations during the second phase. In this context they indicate that this is an area of major importance to the development of the region.

TABLE 5.1 ESTIMATED EMPLOYMENT IN TRENGGANU TENGAH

	1980	1985	1990
Estimated Direct Employment	25,000	29,875	36,328
Estimated Total Employment	32,000	38,000	46,000

5.2 MANPOWER AVAILABILITY

5.2.1 The Estimated Labour Available within Trengganu Tengah

Figures are not available providing an accurate assessment of current employment and unemployment specifically relating to the study area. It is however possible to drive an estimate based on the total population as set out in Section 2.3.

Taking a participation rate of 333 per 1000 as used in the Pahang Tenggara Study implies a current working population of around 11,000. If the estimated participation rate in the State of Trengganu in 1973 of 315 per 1000 is applied the number would fall only marginally i.e. by 5 per cent.

Applying a natural rate of increase in the economically active population similar to that used in the 1968 Economic Development Plan gives a growth in manpower within the region as shown in Table 5.2.

TABLE 5.2 ESTIMATED LABOUR AVAILABLE IN TRENGGANU TENGAH 1973 - 1990

	1973	1975	1980	1985	1990
Total Available for Employment	11,000	11,800	13,900	16,200	18,500

5.2.2 Labour available within the State

There are currently some 6,000 registered applicants for jobs within the State.[1] Making an allowance for the large element of those unregistered but also unemployed and underemployed brings the total to over 30,000 according to an estimate (see Section 2.3) made in 1973.[2]

Reference to Table 2.6 shows that about 67 per cent. of those registered in February 1974 were over 35 years of age. How many of these would be willing and able to take up employment in Trengganu Tengah is an important question to be dealt with during the second half of the study.

Labour supply in the neighbouring states of Kelantan and Pahang is somewhat greater than in Trengganu as measured by official employment statistics. In January, 1974 there were 8,000 job applicants in Pahang and 11,000 in Kelantan. These totals relate only to registered applicants.

When considering possible inward labour migration from other states the adverse influence of developments within those states must be taken into account. For instance, implementation of the Pahang Tenggara scheme will act as a strong counter attraction to the somewhat later development in Trengganu Tengah.

N.B. 1 Register of Job Applicants February 1974

2 Estimate of Labour Force Employment for Trengganu State 1973 - 1975, State Development Office.

Development of the port complex at Tanjong Gelang will also create both direct and indirect employment. This development will not only reduce the possible outward migration from Pahang state but also serve to attract people from Trengganu State.

5.2.3 Phased Supply of Labour to 1990

A rough initial estimate of the additional supply of Manpower from within the State is shown in Table 5.3. This is based on the age distribution of the 1970 population projected forward to 1990.

Between 1974 and 1979 inclusive there will be an increase in males of working age of about 28,000. Allowing for 80 per cent actively seeking employment reduces the total to 22,400. Adding the total 6,000 of those currently actively seeking jobs makes a total available within the State of 28,400 to 1980.

By 1990 a further 62,953 males of working age will be available and if 80 per cent of these are actively seeking work the net addition to the working force will be 50,000.

The estimates shown in Table 5.3 must not be taken as more than a crude indication of overall supply within the State. Migration and changes in the age of school leavers are just some of the factors affecting labour availability.

TABLE 5.3 ESTIMATED POPULATION INCREASE 15 - 65 AGE GROUP AND NET LABOUR SUPPLY FOR THE STATE OF TRENGGANU 1974 - 1990

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total Aged 15 during the year	11609	11311	12761	11356	12367	13878	12591	13265	13207	14095	13471	13399	14000	15000	15450	16000	16500
Less Total Aged 65 during the year	5762	2441	1422	1017	1027	5108	1666	923	1548	1208	8021	3213	2715	1973	1927	7284	2935
Total increase in 15 - 65 age group	5847	8870	11339	10339	11340	8770	11925	12342	11659	12887	7450	10186	11285	13027	13523	8716	13565
Males Aged 15 during the year	5850	5579	6409	5737	6156	6969	6323	6775	6741	7114	6774	6825	7000	7500	7725	8000	8250
Less Males Aged65 during the year	2787	1216	771	555	587	2607	922	544	851	644	3735	1587	1318	1021	973	3056	1423
Total increase in Males in 15 - 65 age group	2877	4363	5638	5182	5569	4362	5401	6231	5890	6470	3039	5238	5682	6479	6752	4944	6827
Total Net Increase in Male Work Force [1]	2302	3490	4510	4146	4455	3490	4321	4985	4712	5176	2431	4190	4546	5183	5402	3955	5462

N.B. [1] Based on 80 per cent participation rate

These are rough estimates and should only be used as a general indication of possible labour supply.

5.3 THE OVERALL MANPOWER SITUATION

Comparing the tentative estimates from Section 5.1 and 5.2 shows that theoretically there will be an adequate supply of labour available within the State to satisfy planned developments in Trengganu Tengah. However, allowance must be made for the competition for labour from all developments outside the study area. Within the State there are planned industrial estates around Kuala Trengganu, proposed changes to the fishing industry in the harvesting and processing of fish and the possibility of a hydro-electric, irrigation and drainage scheme on the Sungei Trengganu. While outside the State the neighbouring port development at Kuantan and the development of Pahang Tenggara will create a considerable demand for labour in competition with Trengganu Tengah.

At this early stage of the study it appears that any deficit of manpower within the state during the development period will be made up by inward migration from Kelantan. This supposition is based on the evidence of the 1970 census which reported that 65 per cent of all immigrants to Trengganu came from Kelantan. Furthermore, the conclusion reached in the Kelantan Regional Planning and Development Study is that the growth in total labour force will initially exceed employment created. This will result in an increase in the total unemployed from 7,000 in 1970 to 37,000 in 1985 in Kelantan State.

In terms of a possible future competitive labour market one of the major problems foreseen is that of providing people with sufficient incentive to settle within a region, which has few amenities at present compared with the coastal region. This aspect will be considered in more detail by the manpower specialist during the second phase of the study.

5.4 FINANCE

5.4.1 Financial Requirement

Within Trengganu Tengah finance will be required for individual agricultural and forest projects as well as for infrastructure and public sector investment. As attempt is made here

to indicate the capital requirements of schemes already committed to implementation.

Table 5.5 is an estimate of the capital cost of certain committed and proposed agricultural developments, forest complexes, processing plants and certain infrastructure.

TABLE 5.5 PRELIMINARY CAPITAL COST ESTIMATE OF PROPOSED DEVELOPMENTS IN TRENGGANU TENGAH

		$ Million	
AGRICULTURAL SCHEMES	Oil palm	94.0[1]	
	Rubber	18.5	
	Other	1.8	114.3
FOREST COMPLEXES	Dungun Complex	81.0	
	SEDC Kemaman Project	3.0[2]	84.0
PROCESSING	Grass Processing Plant	5.3	5.3
INFRASTRUCTURE	Jerangau Road	58.0	58.0
	Total Estimated Capital Cost		261.6

5.4.2 Sources of Finance

In Peninsular Malaysia the Federal Government traditionally plays the major role in financing development. This is largely due to the fact that taxation is principally in the hands of the Federal Authorities. For instance in 1972 the current revenue of the Federal Government was $2,920 million while the revenue from state sources in Peninsular Malaysia totalled $341 million.

In Trengganu revenue from state sources in 1972 totalled $13.5 million ($31 per caput). Current expenditure in the year was $21.5 million and development expenditure came to an additional $7.9 million (see Table 5.6). State revenue thus accounted for slightly less then half of total expenditure and Federal Government grants, loans and reimbursements totalled $11.0 million. In short, Trengganu relies heavily on Federal funds to finance development and must continue to do so until the tax base rises or the structure of taxation is changed.

N.B.[1] Estimate based on Committed and Proposed Oil Palm Schemes of 75,200 acres at $1,250 per acre excluding Cost of Mill.

[2] Paid up capital only.

Due to this fact the public sector financing of Trengganu Tengah will be largely the responsibility of the Federal Government. Certain aspects of development may qualify for loans from international organisations at concessionary rates. Other projects which are not met by Federal funds will have to seek finance from private sources or borrow in the market at commercial rates of interest.

TABLE 5.6: STATE GOVERNMENT FINANCE PENINSULAR MALAYSIA $ MILLIONS

	STATE EXPENDITURE			REVENUE		
				STATE		FEDERAL
	CURRENT	DEVELOPMENT	TOTAL	Total	% of total Expenditure	Total
Johor	52.5	24.6	77.1	49.2	64	27.5
Kedah	34.6	9.5	44.1	23.4	53	15.9
Kelantan	19.2	5.8	25.0	14.4	58	13.2
Melaka	14.0	6.0	20.0	8.8	44	11.4
Negeri Sembilan	29.8	11.2	41.0	22.7	55	13.5
Pahang	65.3	28.3	93.6	52.4	56	11.0
Perak	66.7	18.7	85.4	59.0	69	35.7
Perlis	5.4	0.6	6.0	2.7	45	3.1
Pulau Pinang	26.2	47.8	74.0	21.3	29	51.7
Selangor	72.0	49.2	121.2	74.3	61	30.4
Trengganu	21.5	7.9	29.4	13.5	46	11.0

TABLE 5.7 PROPOSED SOURCES OF FINANCE FOR DEVELOPMENTS IN TRENGGANU TENGAH

AGRICULTURAL SCHEMES:	IBRD/ADB/Federal Government Grant, Private and Market Equity and Loan Capital.
FOREST COMPLEXES:	Private Sources/Federal Loans.
PROCESSING:	ADB/Federal Government Loans/Private and Market Equity and Loan Capital.
INFRASTRUCTURE:	ADB/Federal Government Grants and Loans.

5.5 MARKETS FOR PRODUCTS

5.5.1 General

With the rapid rise in agricultural commodity prices as part of general inflation, continuing monetary instability and the as yet unquantifiable effect on the world economy of the recent rise in oil prices, projection of future demand and price levels is hazardous. At the moment, however, there is some justification for the optimistic assumption that the terms of trade have shifted in favour of tropical agricultural commodities over the longer term. In particular, higher prices for mineral oil is likely to increase the demand for natural rubber and for those vegetable oils which can be substituted for petroleum in industrial uses. But this optimism must be tempered by the fact that the rapid rise in energy prices has in turn cast doubts on the feasibility of maintaining the projected growth rates in the industrialized economies. Slackening world economic growth could lead to a much lower demand than projected for tropical agricultural commodities which, when considered against the elasticity of their supply in the longer run, could induce substantial price falls from present levels.

Therefore, it is prudent when projecting the returns to a major investment to assume that prices will fall considerably from the very high levels reached at the end of 1973, although (in view of the assumption that the terms of trade have moved in favour of agricultural commodities) not to the very low levels of the 1950's and 1960's.

5.5.2 Market Prospects for Proposed Trengganu Tengah Products

(a) Oil Palm

Vegetable oils have experienced a sharp rise in demand in the last year because of expanded use in manufactured food products and as a potential substitute for petroleum in industrial uses. Palm oil has established its competitive position in the international vegetable oil market with production and consumption

expanding rapidly. Provided a major recession does not occur, the prospects for continuing expansion of production would appear favourable but a considerable lowering of price from the 1973/1974 levels is anticipated in the longer term.

On committed developments palm oil acreage in Trengganu Tengah will reach approximately 133,000 acres by 1980. If proposed developments are implemented the total acreage under oil palm will be approximately 208,000 acres by 1990. The committed acreage will represent approximately 8 per cent of the FAO projected national acreage of 1.6 million acres in 1980 and on the total proposed acreage a 20 per cent expansion of the 1973 planted acreage of 1,037,195[1] acres in Peninsular Malaysia by 1990. It is stated in the Mid-Term Review of the Second Malaysia Plan that the significant increases proposed in Malaysian output along with those of other producers are likely to induce a long term price decline. It is hoped that the effects of this price decline will be overcame by rises in productivity. As the proposed Trengganu Tengah developments will form a significant proportion of national expansion they must be examined closely in relation to the planned national increase in acreage and evaluated carefully in terms of their productivity.

(b) Rubber

In the 1970 - 1972 period, new rubber planting was considered a marginal investment because of the increasing share of total elastomer consumption being taken up by synthetic rubber. However, even before the dramatic 1973 rises in oil feedstock costs, rapid inflation in investment and production costs and the problems of pollution were beginning to blunt the competitive edge of synthetic rubber. When the recent rise in oil is combined with natural rubber's relatively low development cost and its position as a renewable resource, the exploitation of which does not cause pollution, its competitive position against synthetic rubber becomes very much more favourable. Tentative projections of 1980 demand have now been increased to between five to six million tons whereas formerly they ranged between four to five million tons, while the projected price has been increased by 66 per cent. These more optimistic projections depend on a

N.B. [1] Second Malaysia Plan Mid-Term Review.

continuation of fairly rapid world economic growth in general and a rapid rate of growth in automobile demand in particular. However, even if the global demand for elastomers does not increase as predicted the prospects for natural rubber still appear relatively favourable. Its production does not create enviromental problems and with technological innovation it has potentially many more end uses that in the traditional automobile industry.

(c) Other Tree Crops

Apart from rubber and palm oil, cashew and fruit trees have been proposed as suitable for development in Trengganu Tengah. With rising population and rising income in Malaysia the market prospects are favourable for expansion of these crops although with a small population and low per capita income in Trengganu State the immediate local opportunities are limited. The main constraint on development of these crops at the moment is the ability to overcome agronomic, processing and marketing outlet problems at a cost which allows a reasonable return at the prevailing market price.

(d) Annual Crops

Rice, maize, soyabeans, groundnuts and cassava are crops for which there is an expanding market for both human consumption and animal feed. The market for rice will depend on the success of the drive towards self-sufficiency in the rest of the country but at the moment there is an estimated annual of deficit of 15,000 tons of rice within the state. The major marketing problem with these crops in new areas is that generally their supply is elastic and they are subject to considerable fluctuations in price. This can be inhibiting to a farmer if initial development costs are heavy. As they are also usually subject to fairly intensive initial research expansion of crop acreage tends to be slow. This is the case in Trengganu where the Ministry of Agriculture is currently engaged in research and expansion around Kuala Trengganu.

(e) Other Crops and Products

Castor bean and sago palms are the other crops which are proposed for development. The market prospects for castor bean both internally and for export are good provided development problems can be solved at reasonable costs while sago is subject to the same market limitations as annual crops. The demand for fresh meat both locally and internationally continues to outstrip supply. Provided there are no insuperable technical problems to introducing cattle in the area the market prospects for beef production appear good.

(f) Timber

With an increasing shortage of timber on the west coast of Peninsular Malaysia, rising internal demand for pulp products and declining forest resources throughout the world, the market prospects for Trengganu Tengah timber are extremely favourable. World import demand in particular is expected to increase, especially from deficit timber areas such as Japan, EEC, United Kingdom and the USA. Future important markets are foreseen in China, the USSR and Eastern Europe. Indonesian hardwood production will be the main competitor to the Malaysian industry in the future.

5.5.3 Conclusion

Although there is considerable confusion in international commodity markets and continuing inflation makes future relative prices of commodities difficult to predict the market prospects for expanding the output of Trengganu Tengah region appear favourable. Investment plans for palm oil planting should be carefully monitored against the international market situation as it develops since Malaysian production has such a large impact on world production. The market prospects for other crops and cattle would appear to be better than at any time during the past twenty years. The main constraints on their development will be the technical problems faced in opening up new areas.

SECTION 6

GENERAL COMMENT ON DEVELOPMENT IN THE REGION

1 TRENGGANU TENGAH COMPARED TO OTHER REGIONS

The study area has remained largely virgin forest because it possesses no apparent advantages over other regions. The East Coast region as a whole suffers from relatively poor, and therefore expensive, communication with the more developed West Coast. Port facilities are limited and there are no rail links within Trengganu State. The combination of poor communication. and lack of widely based valuable natural resources has held back development in the State of Trengganu and particularly in the Trengganu Tengah area.

Although in theory approximately 50 percent of the total land area in Trengganu Tengah is suitable for agricultural use much of this land presents a difficult combination of swamp and steep slope. Allied to the generally high level of rainfall,annual yields of most crops per unit area tend to be lower than on the West Coast and the unit cost of production for many crops tends to be higher.

Irrespective of this comparative disadvantage with other regions, the net present value per acre discounted at current rates of interest is likely to be higher for most suitable agricultural crops than for any accepted forestry use.

A strategy for development based upon agricultural projects where these are economically and technically acceptable together with planned forest operations appears the only choice for Trengganu Tengah because of the basic physical characteristics.

6.2 INCORPORATION OF THE NEP OBJECTIVES IN THE DEVELOPMENT PLAN

Comment has already been made in section 4 on the necessity of employing criteria suitable for evaluating individual projects in terms of the specific objectives of the New Economic Policy.

A development strategy based on agricultural and forestry projects will in practice significantly raise the gross value added per head of population while also increasing individual income. In addition the efficiency of different projects in terms of distribution of income should also be closely evaluated. The N.E.P. aim of widening job opportunities is less easy to achieve through the development of agriculture and forestry sectors, although to a certain extent processing plants will help to achieve this objective, both directly through the creation of skilled and semi-skilled jobs and also indirectly through the demand for ancillary services.

Encouraging Bumiputra participation will depend upon an effective use of the institutions already in existence which are designed to achieve this goal and should not be difficult in a state with a high percentage of Malay population. Where private investment is involved eventual Bumiputra participation may be achieved through a form of wider share ownership, possibly with the development Authority or another agency acting as trustee.

6.3 THE PHASING OF DEVELOPMENT

The rate at which development proceeds will depend upon certain key variables. Initially the speed and disposition of logging operations will directly affect the land clearing activities for agricultural use. As logging licenses and long term agreements were granted sometime before the initiation of development, timber extraction and proposed agricultural development cannot always be complementary.

The future development of agriculture is aided if forest roads are sited with this future use in mind. As high axle loading speeds both forest and agricultural development, the initial design of roads and bridges must incorporate a more than adequate axle load margin: assumed load restrictions of 20 tons on 3 effective axles and 12 tons on 2 effective axles are inadequate in this respect. 1/

The co-ordination of forest exploitation, burning and planting requires close liaison throughout and it is highly recommended that forest licensees and developers work with the same planning

N.B.1 "FEASIBILITY STUDY JERANGAU-JABOR ROAD :
-Ove Arup and Partners (1973)

maps. It is also recommended that only boundaries enclosing areas actually cleared and surveyed are marked with solid lines on maps while planning boundaries should be marked with broken lines.

All planning should include an adequate allowance for delays in implementation and execution. The schedule of phasing clearance of forest land shown below is set out in chronological order up to the point of release for agricultural development.

Stage 1 - Planning on the basis of Reconnaissance Soil Suitability Map.

Stage 2 - More detailed soil survey.

Stage 3 - Allocation of land use between forestry & agriculture.

Stage 4 - Demarcation and survey of proposed agricultural land.

Stage 5 - Mapping and timber inventory.

Stage 6 - Provision of road access & internal road system.

Stage 7 - Removal of commercial timber.

Stage 8 - Release of land by Department of Forestry.

The rate of development depends on the availability of adequate labour both to contractors undertaking the basic work and to farming enterprises engaged in crop establishment. The initial calculations of labour availability show that in the later years of the study period there should be adequate labour available if allowance is made for some inward migration from Kelantan and other States. It is possible that in the earlier years (1975 - 1980) there will be some difficulties in obtaining labour, particularly where specific skills are needed. For instance the Bukit Besi Rubber Estate has identified a shortage of rubber tappers which may create problems during the initial years. It is also possible that a period during which several developments are to proceed concurrently, would create demand greater than the capacity of existing contractors. The rate of overall development would then have to be slowed down if total contracting capacity was not increased both in terms of labour and machines.

Delay on the construction of roads and other infrastructure would retard agricultural development due to poor site access. It is understood that road contractors will not permit any outside

use of the main and feeder roadways during construction. It is however recommended that access be allowed for traffic to sites adjoining the proposed roadways as soon as practicable.

The inter relationship between settlement and development will exert a very great influence on the phasing of schemes. Those projects already committed have in many cases already embarked upon policies of settlement within the confines of their own boundaries. Infrastructure planning during phase 2 of the study will have to take account of commitments entered into. Apart from these, constraints future infrastructure planning should be based on a logical network derived from experience gained in other areas.

At this stage of the study it does not appear that capital availability is likely to be a constraint on development.

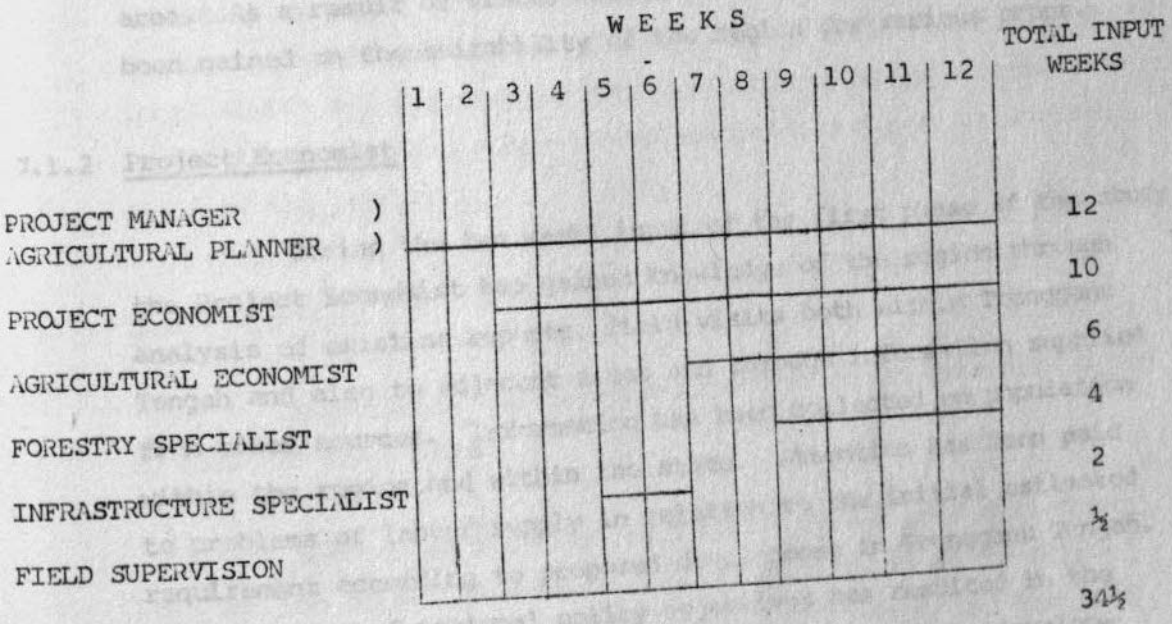
SECTION 7

REVIEW OF WORK COMPLETED DURING FIRST PHASE OF STUDY

7.1 WORK PROGRAMME

As indicated in the Inception Report the first phase of the study has absorbed less than 25 per cent of the total input allocated to the Study. The inputs of Consultants' Staff up to the presentation of the Interim Report are shown in Table 7.1.

TABLE 7.1 CONSULTANT STAFF INPUTS DURING PHASE I OF STUDY
16TH FEBRUARY, 1974 - 15TH MAY, 1974



During this period the Consultants have made several field visits both within and outside the study area. These visits and meetings described in Paragraph 7.3 include visits to the ongoing projects within Trengganu Tengah. The Consultants have also inspected agricultural enterprises and processing facilities outside the area which are thought to be relevant to the study.

A brief outline of the work schedule undertaken by the Consultants during the initial phase of the Study is given below for each team member.

7.1.1 Agricultural Planner

Although the Agricultural Planner has completed an input of 12 weeks during the first phase, a significant proportion of this time was taken up with project administration. Time devoted to agricultural work has enabled the collection of information on existing land use within Trengganu Tengah, soil suitability, climate and hydrology. The physical area committed to agricultural developments has been established and detailed investigation has resulted in an estimate of the balance of land suitable for agricultural development although not yet allocated. This detailed information is included in the Report in map form. Data has been collected on existing agricultural operations inside and outside the project area. As a result of visits within the region some knowledge has been gained on the suitability of the region for various crops.

7.1.2 Project Economist

During the ten weeks input of the first phase of the study the Project Economist has gained knowledge of the region through analysis of existing reports, field visits both within Trengganu Tengah and also to adjacent areas and through information supplied from other sources. Information has been collected on population within the region and within the state. Attention has been paid to problems of labour supply in relation to the initial estimated requirement according to proposed development in Trengganu Tengah. Consideration of national policy objectives has resulted in the establishment of criteria for policy evaluation in the development plan.

7.1.3 Agricultural Economist

During the short first phase input, the Agricultural Economist has worked closely with the Agricultural Planner in evaluating existing agriculture within Trengganu Tengah and in adjacent areas. He has analysed technical data collected from the Agricultural Planner and other studies and reviewed the overall marketing situation for existing and potential crops.

7.1.4 Forestry Specialist

Although the Forestry Specialist has only been available for a short period before preparation of the Interim Report he has assembled information on the existing state of forest development in the region. He has carefully studied available maps of forest resources and worked closely with the State Director of Forestry.

7.1.5 Infrastructure Specialist

The first phase input of the Infrastructure Specialist consisted of a two week familiarisation visit in March, 1974. This visit enabled him to collect information on population relevant to the study area and to contribute to decisions regarding siting of feeder roads off the proposed Jerangau-Jabor trunk road. Through local visits and the study of existing reports he has gained knowledge of the area and present developments for use in the second phase of the study.

7.2 DATA COLLECTION

Information has been gathered from published material and by personal interviews.

Sources of published data include the Economic Planning Unit and the Bureau of Statistics in Kuala Lumpur and the State Development Office, the State Department of Forestry and the LKTT library in Kuala Trengganu. From these and other sources, the Consultants have obtained most of the publications providing technical and economic information of relevance to the Trengganu Tengah Development Study. The collection of data will continue as new sources of information come to light and as recently published information becomes available.

In their Inception Report, the Consultants drew attention to certain difficulties encountered in the collection of published material. We are pleased to record that most of these have now been overcome, but some delays have still been experienced. A list of the published material gathered so far is given in Appendix B.

Data collection, by personal interview, is a continuing process as the contacts made by the Consultants become more numerous and wide ranging. In a study of this nature there are many aspects which can only be assessed from personal contacts with individuals concerned and a wide range of interviews is necessary to obtain a representative concensusof opinion. During the first phase of this study, the Consultants have mainly confined their activities to the Trengganu area. In the second phase it is anticipated that opinions and information will be sought from a wider field. The informal study group procedure outlined in the Inception Report has proved to be a useful and convenient method of obtaining information from key individuals concerned with the development programme.

Following the presentation of the Inception Report, the Consultants undertook to identify subjects on which basic data was lacking. The most obvious subject is, regretably, the natural resources of Trengganu Tengah. The limitations of the land classification and soil data have already been described in Section 2.2.4. The information on rainfall and hydrology is also scanty, being based mostly on short term observations. In neither of these cases is it practicable to propose additional data collection within the present study period. As already mentioned, there is an ongoing soil survey of part of the Trengganu Tengah area the results of which will be published in 1975. It can only be used to qualify the existing classification of the land and the proposals made in this study. Forestry is a second area where basic data is lacking. The Consultants draw attention to the fact that the bicyclic programme of felling is being introduced before publication of the basic data to justify the system. It is believed that some of this data may be available but it is of little value to this or any other study unless it is in published form.

Basic data is also lacking on agricultural research results relating specifically to crop production in the Trengganu Tengah area. The particular combination of high seasonal rainfall and variable soil conditions encountered in the area make it difficult to recommend commercial ventures into crops other than oil palms, rubber and padi. These are the only crops for which informa-

tion is comprehensive enough to enable firm recommendations to be made. It has already been pointed out in Section 3.1.2. that facilities for agricultural research are available in Trengganu Tengah and the Consultants have strongly recommended that these facilities should be activated immediately to provide more basic information as soon as possible. Data on land areas has also proved to be inadequate in some cases. The area measurements of some forest reserves and agricultural projects have not always been accurate while the area of land in Trengganu Tengah which is already alienated has not yet been accurately defined. However, the Consultants are hopeful that in these cases, it will be possible to delineate these areas on the basis of presently available information, although collection of this information may prove to be a time consuming task.

7.3 FIELD STUDIES

In view of the nature of this study and the time available, the Consultants do not think it appropriate to spend considerable time collecting basic data in the study area. However, in their search for published material and appraisal of current conditions the Consultants have made a number of visits to offices and projects within and around Trengganu Tengah. These are listed below:

(i) In Kuala Trengganu

State Development Office
State Department of Agriculture
State Department of Forestry
Election Commission Office
Department of Labour and Manpower
State Economic Development Corporation (SEDC)
FELDA, Trengganu Office
RISDA, Trengganu Office

(ii) In Trengganu Tengah

FELDA, Bukit Bading Settlement Scheme
FELDA, Seberang Tayor Settlement Scheme
MARDI, Jerangau Field Experiment Station
SEDC, Bukit Besi Rubber Estate
Bukit Besi Mine Site
Jerangau/Landas Cocoa Estates
NADEFINCO Oil Palm Estate
Jabor Valley Estate

(iii) Outside Trengganu Tengah

SEDC Sungei Tong Oil Palm Estate
FELDA Belara Settlement Scheme
FELCRA Bukit Kapah Youth Scheme
MAJUTERNAK Cattle Project, Kuala Brang
MRDC SMR Factory, Kuala Brang
Department of Forestry/FAO - Gunong Tebu F.R. (Cutting and Growth Trials)
Kretay Estate, Kerteh
FELDA Regional Office, Kuantan, Pahang
State Agricultural Office, Kuantan, Pahang
Agricultural Industries Corporation (LKPP), Kuantan, Pahang
Pahang Tenggara Development Authority (DARA) Kuantan, Pahang

7.4 COURTESY CALLS

The Project Manager has continuedhis round of introductory visits as stated in the Inception Report. These have included visits to the District Offices at Kuala Brang, Dungun and Kemaman and the Trengganu Office of the Department of Public Works.

Finally, on 25th March in the company of the Economic Planning Unit,Board Members of Lembaga Kemajuan Trengganu Tengah and the Deputy Managing Director of Hunting Technical Services, the Project Manager paid a courtesy call on the Yang Amat Berhormat, Menteri Besar of Trengganu.

SECTION 8

OUTLINE OF WORK PROGRAMME DURING SECOND PHASE OF THE STUDY

8.1 THE MAIN POINTS TO BE COVERED

8.1.1 General Objectives

The principal objective of the Trengganu Tengah Regional Planning and Development Study is to prepare a guide in planning to assist the Trengganu Tengah Development Authority in their task of developing the area during the period 1974 - 1990. The main guidelines and major points to be considered by the Consultants are clearly stated in the Terms of Reference which form part of the Agreement between the Government and the Consultants. The Terms of Reference are included in this report as Appendix A. The Consultants are asked to consider the implications of their proposals for the development area in the light of the economic and social objectives of the Government with particular emphasis on the need to raise the levels of employment and income in Trengganu to a standard comparable with that prevailing in other states in Malaysia. Furthermore, it is particularly requested that steps should be taken to maximise the opportunities for Bumiputra participation at all levels both in the physical and economic aspects of the development programme. These general objectives form the background to the Consultants' work on more specific subjects and are basically implied in the section on Development Strategy in the Terms of Reference. It is now proposed to examine the other main headings in the Terms of Reference and to indicate how the Consultants intend to direct their studies in dealing with them.

8.1.2. Alternative Strategies

The choice of strategies is in effect a choice between alternative paths along which development in the region will proceed. As indicated in Section 4, it is proposed to analyse various projects and the means of implementing them in terms of their effeciency in meeting the principal objectives of employment creation, income generation and creation of job opportunities. Initial

work on these aspects indicates that there may be a clash between different methods of implementation. For instance, it appears that for oil palm, estate type operations produce a higher value added per employee than a settler scheme although the distribution of income of the latter is more successful in meeting the NEP objectives. It is proposed to develop these themes in detail in the second phase of the Study so that alternative paths can be jointly evaluated by Government and the Consultants before presentation of the Draft Final Report in September.

8.1.3 Role of the Public and Private Sector

The Consultants have already identified the degree of participation of the private and public sectors in Trengganu Tengah for the present state of development. The public sector agencies were committed to develop considerable areas of the region before the Development Authority was established. The Consultants feel that, so far, there is no serious imbalance between the public and private sectors. The Consultants have been in contact with most of the government agencies and commercial enterprises concerned at a local level and it now remains to establish contact with the headquarters of these bodies in order to consider what role they should play in completing the development process.

8.1.4 Population and Labour

The Consultants have already examined the questions of population and manpower availability in some depth and tentative projections are included in this report. The questions of the range of skills required to implement the development programme and of the training programmes required to provide them will be dealt with in the second phase by the Manpower Economist.

8.1.5 Settlement Pattern

The determination of the settlement pattern for Trengganu Tengah can only be considered in detail once the overall programme for development has been outlined. The Consultants' Infrastructure Specialist has already made a brief visit to Trengganu to establish contacts with the authorities there and to make a brief survey of the existing situation.

During phase 2 of the study he will initially examine the direct and indirect employment and total population estimates for the area up to 1990 derived from analysis of various developments. From this initial work a comprehensive pattern of settlement will be produced based on data supplied by the team members, experience gained from other settlement schemes and refined population and migration estimates. The overall planning will stress flexibility and the incorporation of adequate social and physical infrastructural support systems.

8.1.6 Forestry

A brief statement of the current programme of forestry operations is included in this report and the Forestry Specialist, will, in the second phase of the study, be considering those aspects of forestry which concern the phasing of agricultural development with particular emphasis on the current state of licensed logging operations. In addition it is intended to present a clear statement of the position of all the forest reserve areas within Trengganu Tengah including those areas which will form part of the proposed Forest Industry Complex projects in Dungun and Kemaman districts. The Consultants will also consider the possibility of other forest-based industries in addition to the two complexes mentioned.

8.1.7 Agriculture Diversification

The Consultants have already studied the ongoing agricultural developments in Trengganu Tengah and adjacent areas and have made contact with many of the organisations engaged in diversification activity. An initial assessment has been made of the possibilities for diversification from the traditional agricultural crops into different crops and types of agricultural development.

The Consultants have noted that the tentative project proposals presently being studied by LKTT include a number of diversification possibilities and these will be considered in the light of their technical feasibility and social influence on the region. The question of diversification into new crops in Trengganu Tengah has to be looked at very carefully. The area is

not inherently the most suitable part of Malaysia for any type of agriculture and basic knowledge on crops which might be suited to the area is lacking. This along with a general shortage of management skills is likely to be a severe constraint on any rapid introduction of new crops or livestock schemes.

The Consultants feel that although the market prospects for diversification are encouraging, the possibilities for doing so should be primarily related to the objectives of the New Economic Policy, to raise employment, income and participation levels, rather than solely based on apparently profitable investment opportunities at current high prices.

8.1.8 Project Implementation Studies

The pattern of development in Trengganu Tengah has already been partly determined by the existence of ongoing projects and prior commitments made in some cases, before the establishment of LKTT and in all cases before the start of the present study. In identifying key projects for immediate implementation the Consultants will consider first, those projects which have already gone some way towards being adopted by the Authority and will indicate in a general way how these proposed projects fit into the overall pattern. The Consultants will also indicate, which of these projects are (in their opinion) suitable for immediate implementation and which should be subjected to further study before approval by the Authority. The Consultants will also investigate the possibility of other project opportunities and present these to the Government for their consideration.

8.1.9 Structure Plan

Having decided the basic pattern for agricultural and other development in the area, the Consultants will express this in terms of a structure plan which will phase the developments in agriculture and other industries with the proposed development of infrastructure.

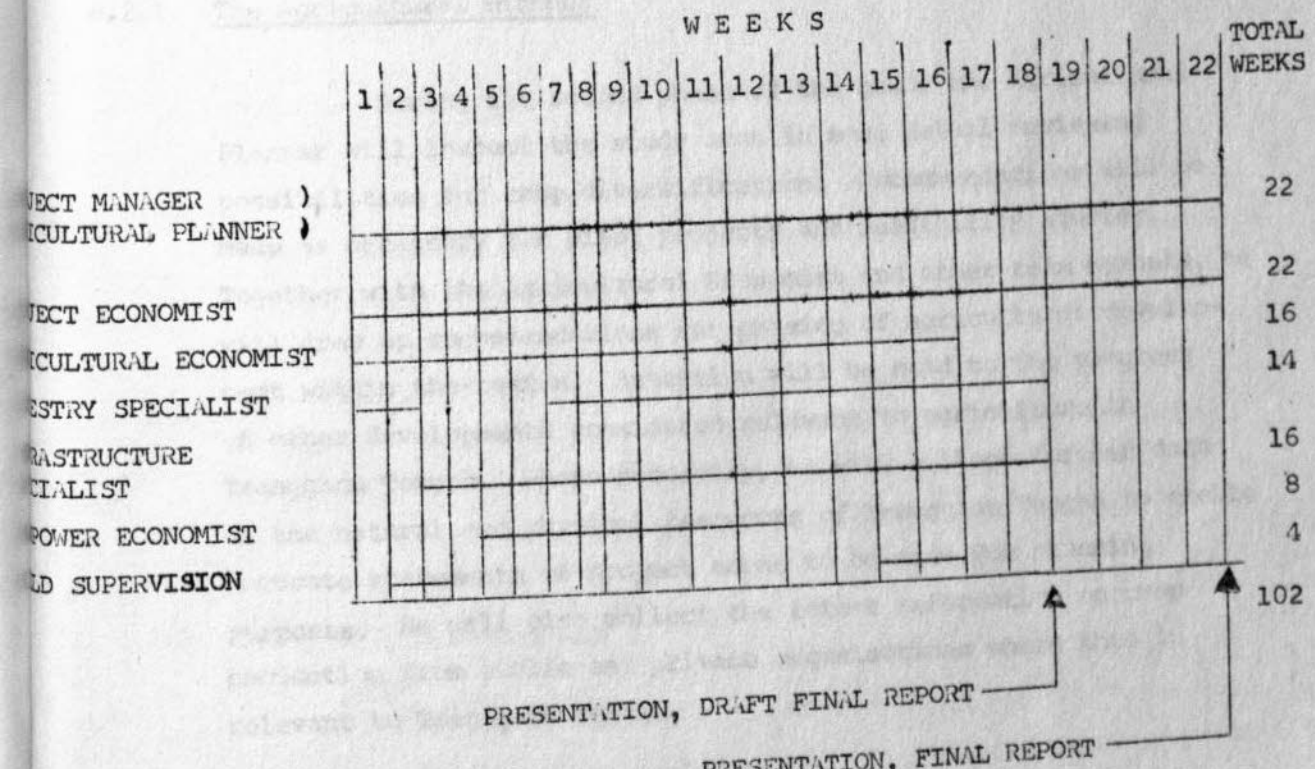
8.1.10 Institutional and Implementation Aspect of the Plan

The Consultants will appraise the role of all agencies concerned with implementing the plan for Trengganu Tengah. The role of the Trengganu Tengah Development Authority (LKTT) is considered to be especially important in this case particularly with regard to the long term programme for this organisation.

8.2 PROPOSED WORK PROGRAMME

The second phase of the study will receive the greatest input of consulting time. The proposed inputs are shown in Table 8.1.

TABLE 8.1 PROPOSED CONSULTANT STAFF INPUTS DURING PHASE 2 OF STUDY
15TH MAY, 1974 - 15TH OCTOBER, 1974



In Table 8.1, it should be noted that the end of week 18 falls on 15th September, the date on which the Draft Final Report must be presented. It is hoped that the contents of that report will very largely have been the result of close consultation between the Consultants and the Government and that the process of discussion of the report will result in only minor alterations to the draft. During the final month of the study, the Project Manager/Agricultural Planner and the Project Economist will be concerned in these discussions and the physical preparation of the Final Report. Thus the working period available for preparation of the Draft Final Report is effectively 3½ months from 15th May bearing in mind the time required for preparation of the report.

An outline of the proposed work schedule for the Consultants' staff is given below.

8.2.1 The Agricultural Planner

During the second phase of the study the Agricultural Planner will inspect the study area in more detail reviewing possibilities for crop diversification. Recommendations will be made as necessary for pilot projects and feasibility studies. Together with the Agricultural Economist and other team members, he will draw up recommendations for phasing of agricultural development within the region. Attention will be paid to the progress of other developments considered relevant to agriculture in Trengganu Tengah. Where necessary, he will collect further data on the natural and physical resources of Trengganu Tengah to enable accurate statements of project areas to be made for planning purposes. He will also collect the latest information on crop production from public and private organisations where this is relevant to Trengganu Tengah.

8.2.2 The Project Economist

The Project Economist will work closely with other team members to derive a phased programme of development. He will use criteria which will ensure that the objectives of the New Economic Policy are incorporated in the development plan. Together with the Agricultural Economist and Forestry

Specialist he will examine markets for products and assess price projections. He will review the projected settlement pattern in relation to proposed migration and set out a general economic forecast for Trengganu Tengah up to 1990. Proposed implementation policy will be developed in conjunction with LKTT during the second phase.

8.2.3 Agricultural Economist

The Agricultural Economist will analyse proposed cropping systems and recommend crops and farming systems suitable for incorporation in the overall development plan of the region. He will closely monitor commodity price movements and consider price projections for relevant commodities where possible. He will produce physical input information and show labour requirements for different enterprises. Together with the Agricultural Planner he will investigate diversification opportunities and evolve crop and enterprise budgets.

8.2.4 Forestry Specialist

He will make recommendations for the development of forest resources in Trengganu Tengah which best meet the objectives of the New Economic Policy. He will advise on implementation of forest operations and how they should be phased to meet the requirements of the recommended agricultural development plan. Proposed forest complexes will be examined in relation to their contribution to the development plan and recommendations will be made regarding other developments considered applicable.

8.2.5 Infrastructure Specialist

Working within the Terms of Reference and the objectives of the development plan of the region, the Infrastructure Specialist will locate the major areas for agricultural and forestry processing and related activities. He will make recommendations as to settlement within the region making due allowance for health, education and social amenities.

8.2.6 Manpower Economist

The major problems of manpower availability in relation to the requirements of development in the region, and the analysis of incentives to encourage inward migration will be undertaken by the Manpower Economist. He will study proposed development and ascertain the phased requirement for manpower according to skill and will recommend methods by which any anticipated shortfall can be overcome including proposed training programmes.

8.2.7 Additional Inputs

At this stage of the study it does not appear necessary to call for further inputs of specialist Consultant staff. The major aspects of employment, training and migration will be dealt with by the Manpower Economist during the second phase of the study. Although the diversification possibilities for agriculture in the region would appear to be restricted by climate and topography it is envisaged that identification and analysis of such possibilities will take some time since published information is limited. It may be necessary, therefore, to consider extending the input time of the Agricultural Economist.