

THE GOVERNMENTS OF MALAYSIA AND STATE OF

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MIRI—BINTULU
REGIONAL PLANNING STUDY

MAIN REPORT

VOLUME I

JUNE 1974

Hunting Technical Services Limited
London

Hoff and Overgaard
Copenhagen

**THE GOVERNMENTS OF MALAYSIA AND THE
STATE OF SARAWAK**

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MIRI BINTULU REGIONAL PLANNING STUDY

Chief Secretary to the
Government of Malaysia,
Secretariat Planning Unit,
1, Jalan Lumpur

Chief Financial Secretary,
Kuching,
Sarawak

Sir,

We are pleased to submit our report following the
completion of our planning studies in the Miri/Bintulu
District.

The study was carried out by a team which included our
staff and representatives of the Sarawak Government. We were
assisted by a group of available
experts who were invited to Sarawak in a number of
visits. The study was carried out in accordance with the
terms of Reference (Annexure II) and the programme of annual tasks
approved for the Sarawak Government activities under the Action
Programme for Sarawak.

THE MAIN REPORT

The Main Report is supported by 10 Supporting Reports
and a schedule of proposals. Each Supporting Report provides,
by sector, the detailed information upon which the contents of the
Main Report are based.

In conclusion we wish to express our gratitude for the
extensive cooperation which we received from so many institutions and
individuals in both the public and private sector. Without this
cooperation, our task would have been immeasurably more difficult.

— 1974 —

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Chief Secretary to the
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State Financial Secretary,
Kuching,
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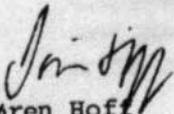
Dear Sirs,

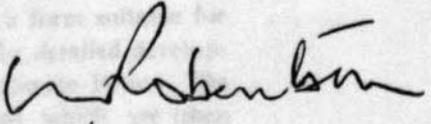
We have pleasure in submitting our Report following the completion of our planning studies in the Fourth Division (Miri/Bintulu) of Sarawak.

The Main Report consists of 2 Volumes and contains our findings and recommendations based on information which we have collected. A third volume (Annexure I) contains a group of investible projects. These have been described and analysed in a manner suitable for appraisal by a financing agency. The fourth volume (Annexure II) entitled 'Development Packages' tabulates the details of annual tasks and expenditures for all development activities within the Action Programme Period (1975-80).

The Main Volumes are accompanied by 10 Supporting Reports and a container of resources maps. Each Supporting Report provides, by sector, the detailed information upon which the contents of the Main Report are based.

In conclusion we wish to express our gratitude for the extensive cooperation which we received from so many institutions and individuals in both the public and private sector. Without this cooperation, our task would have been immeasurably more difficult.


Søren Hoff
Hoff and Overgaard.


V.C. Robertson
Hunting Technical Services Ltd.

PREFACE

THE MAIN REPORT

The main report presents a survey and summary of the Consultants' findings, conclusions and recommendations. In certain instances these recommendations concur with those already proposed by the State Government, including for instance the deep sea port at Bintulu and the Cattle Ranch Scheme. All these findings are described in more detail in ten Supporting Reports. The Main Report is composed of two volumes as follows:

VOLUME I

The Plan Outline (Chapter 1) summarises recommendations for a balanced development of the Region up to 1990. The chapter also provides a concise statement of basic goals.

The Regional Plan (Chapter 2) describes the salient features of development in the Study Area in both the short and the longer terms.

The Action Programme (Chapter 3) contains a summary of projects planned to be implemented in the six year period 1975 to 1980 the Action Programme Period. These projects are a detailed expansion of the general development ideas and recommendations set forth in the Regional Plan.

VOLUME II

An exposition of the various elements of development including a description of the basic planning criteria, assumptions and considerations which have been the basis for planning the general development of the whole Region. The various chapters identify natural and human resource potentials for development; they describe and argue for the selection of certain areas for development of various activities; they describe these activities and their mutual interdependence and they estimate and evaluate the social and economic consequences of the recommended development.

The exposition is supported by tables and figures, and by two coloured maps illustrating:

- The Action Programme
- The Regional Plan.

These are located at the rear of the Report.

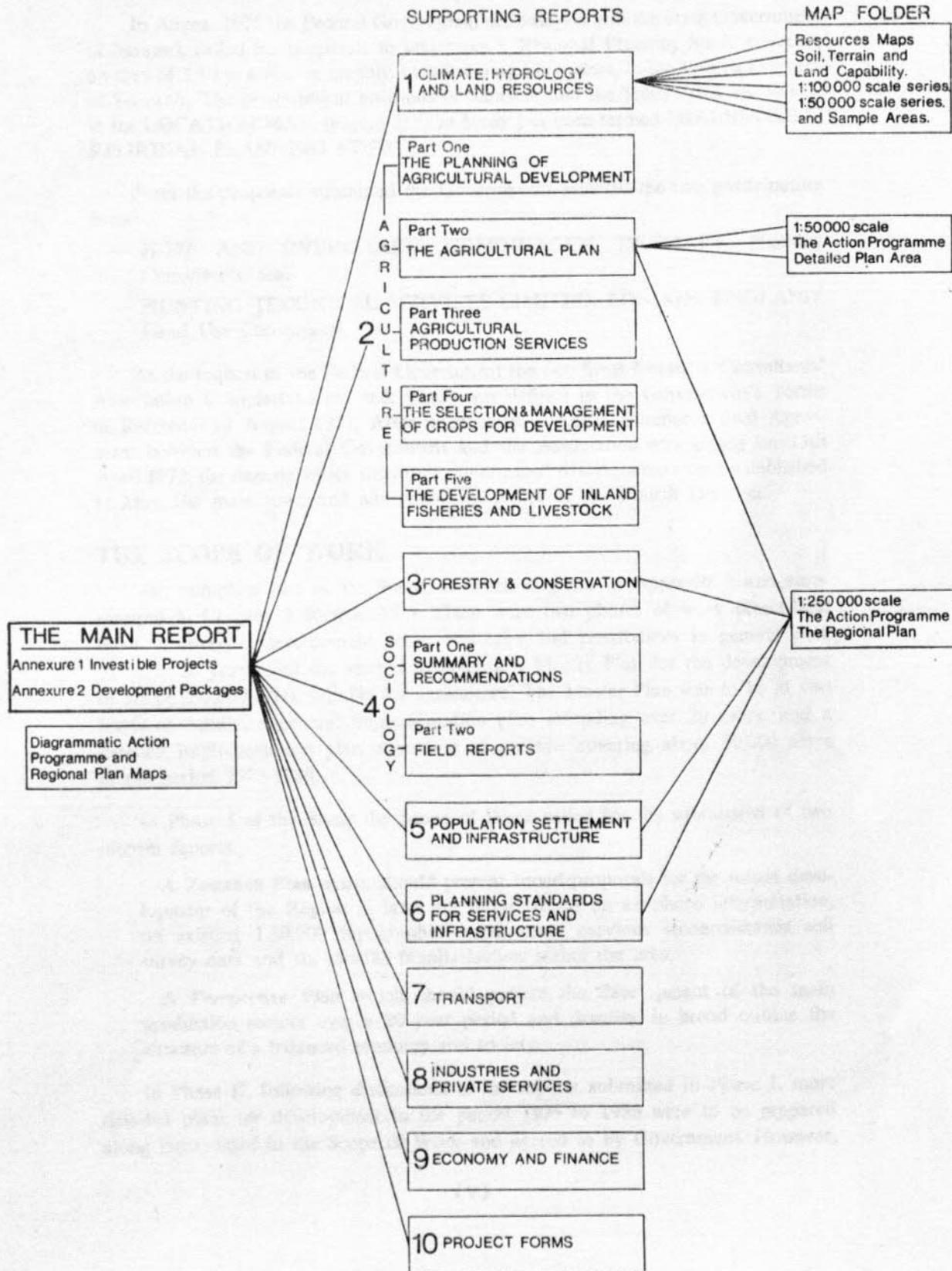
Accompanying this Main Report are two Annexures; Annexure I presents ten projects which have been prepared in accordance with a directive in the Scope of Work which states "suitable projects or project packages must be prepared up to internationally accepted standards so as to permit an evaluation of their economic justification". The projects are given in a form suitable for independent financing. Annexure II presents in table form the detailed development planned for implementation during the Action Programme Period. The programme is broken down into its component projects which are then

presented in two ways; first by location which groups together projects which are linked by their physical position; the second way is by years which gives the phasing of the programme.

STRUCTURE OF THE FINAL REPORT

The complete Final Report has several components dealing with the various aspects of the Plan and Study at different levels of detail. This is shown in Figure 1.

FINAL REPORT STRUCTURE



FOREWORD

BACKGROUND FOR THE STUDY

In August 1971 the Federal Government of Malaysia and the State Government of Sarawak called for proposals to undertake a Regional Planning Study covering an area of 3.5 million acres, or roughly 14,000 square kilometers, in the Fourth Division of Sarawak. The geographical positions of Sarawak and the Study Area are shown in the LOCATION MAP, (Figure 2). The Study has been termed MIRI-BINTULU REGIONAL PLANNING STUDY.

From the proposals submitted the Governments selected the two participating firms:

- HOFF AND OVERGAARD, COPENHAGEN, DENMARK, Planning Consultants, and
- HUNTING TECHNICAL SERVICES LIMITED, LONDON, ENGLAND, Land Use Consultants.

At the request of the Federal Government the two firms formed a Consultants' Association to undertake the task which was defined in the Government's Terms of Reference of August 1971. After negotiation in Kuala Lumpur a final Agreement between the Federal Government and the Association was signed on 15th April 1972, the date on which the Study commenced. Headquarters were established in Miri, the main town and administrative centre of the Fourth Division.

THE SCOPE OF WORK

The complete text of the Scope of Work is given in Appendix I and summarised in Chapter 2 Section 2.1.3. There were two phases of work prescribed; the first covering development goals, strategies and possibilities in general over the next 20 years, and the second to prepare a Master Plan for the development of about 250,000 acres suitable for agriculture. The Master Plan was to be at two levels of details; a general implementation plan extending over 20 years, and a detailed implementation plan consisting of projects covering about 50,000 acres in the period 1975-1980.

In Phase I of the Study the Scope of Work called for the submission of two interim reports.

A Zonation Plan which should present broad proposals for the future development of the Region in land use terms, based on air-photo interpretation, on existing 1:50,000 topographic maps, some previous reconnaissance soil survey data and six months familiarisation within the area.

A Perspective Plan which should project the development of the main production sectors over a 20 year period and describe in broad outline the structure of a balanced economy and society.

In Phase II, following discussions of the reports submitted in Phase I, more detailed plans for development in the period 1975 to 1980 were to be prepared along lines stated in the Scope of Work and agreed to by Government. However,

work and discussions carried out during Phase I of the Study showed a need for a redefinition of the work to be performed during Phase II, so that this phase would result in:

- (a) a Regional Plan for the next 20 years, which should include a land settlement and agricultural development programme covering about 250,000 acres;
- (b) an agricultural and forestry Action Programme for the early development of about 50,000 acres of land, and
- (c) a related Action Programme up to 1980 for the development of the other sectors of the economy.

These guidelines were put forward in a letter of 16th February 1973 from the Consultants' Association to the Government. The full text of this letter is reproduced in Appendix II. The principal view expressed was that the concept of a Master Plan specifically for 250,000 acres was no longer appropriate because the individual areas suitable for agricultural development were smaller than had been expected and were spread widely throughout the Region. It was therefore considered preferable to prepare an Outline Plan for the development of the Region as a whole and an Action Programme for the priority development of 50,000 acres within it.

WORKING PROCEDURE

The Agreement states that "the Consultants shall be solely responsible for carrying out the assignment and the analysis and interpretation of all data, and for the findings, conclusions and recommendations contained in their Reports". It further states that "the Two Governments will set up a joint Steering Committee to which the Consultants will be responsible and which will facilitate co-ordination between the Consultants and all Government Agencies".

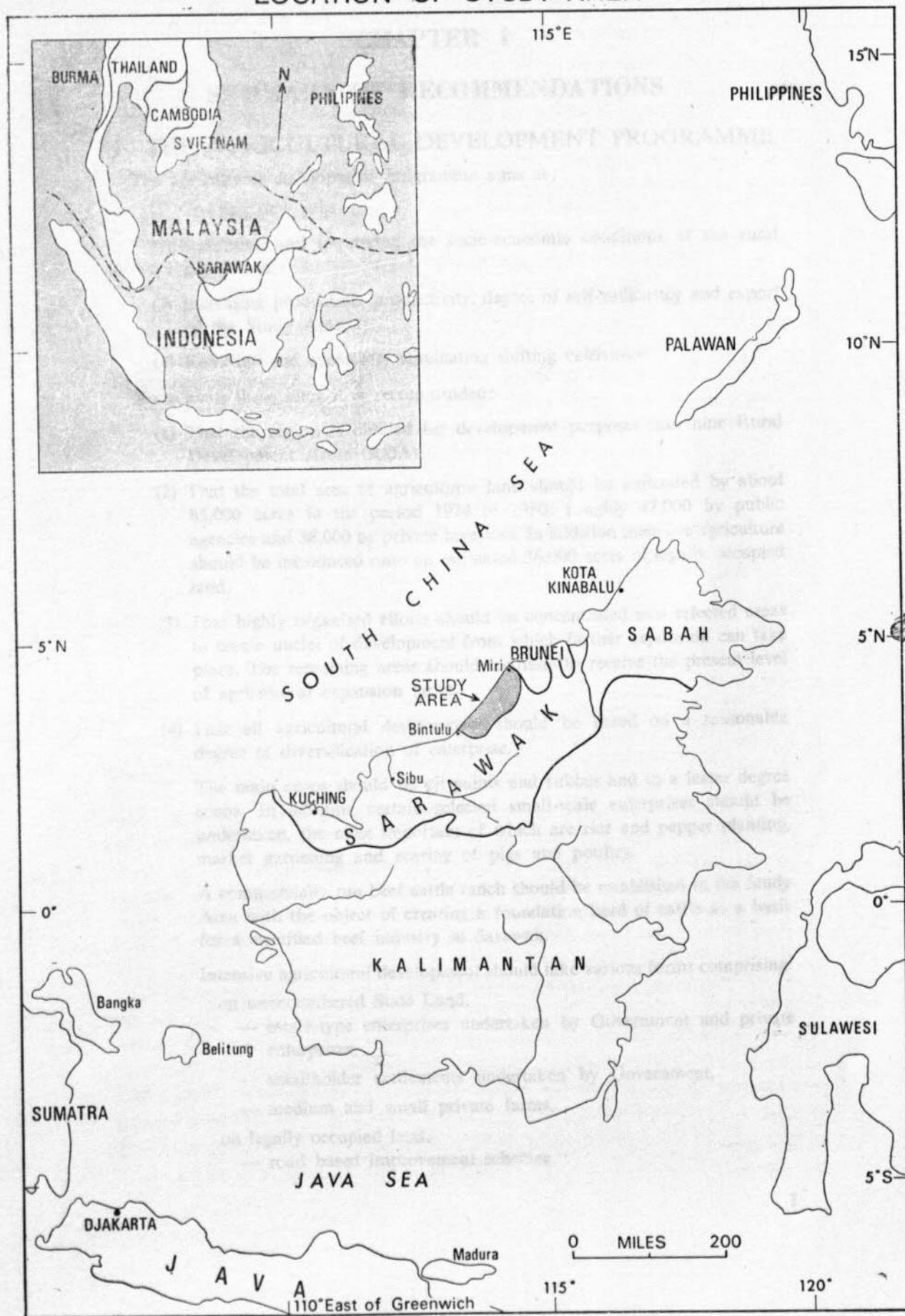
The Steering Committee met every two months for discussions with the Consultants. The bases of the meetings have been Working Papers, Progress Reports and special presentations by the Consultants of specific aspects of the Study. The latter were often supported by memoranda and illustrative diagrams and tables. These discussions, often continued with the individual Departments concerned, ensured that Government was aware of the ideas and recommendations set forth in this Report. In fact some have already been put into effect by Government agencies.

COLLECTION AND SOURCES OF INFORMATION

The Consultants have collected information in several ways; from studies of official statistics, Government annual reports and files, international statistics and reports, from field investigations as well as in interviews and conversations with Government officials, private prominent persons and representatives of private enterprise. All information used and applied to the Plan is presented in the various Supporting Reports which, combined with this Main Report, make up the Final Report of this Study.

Liaison with both Governments and the allocation of tasks both for the Consultants and local counterparts within the Study are shown in Appendix III.

LOCATION OF STUDY AREA



CHAPTER 1

SUMMARY OF RECOMMENDATIONS

1.1 THE AGRICULTURAL DEVELOPMENT PROGRAMME

The agricultural development programme aims at:

- (1) Creating new jobs.
- (2) Stabilising and improving the socio-economic conditions of the rural population.
- (3) Increasing production, productivity, degree of self-sufficiency and export of the Study Area.
- (4) Reducing and eventually eliminating shifting cultivation.

To achieve these aims it is recommended:

- (1) That the region is divided for development purposes into nine Rural Development Areas (RDA).
- (2) That the total area of agricultural land should be expanded by about 85,000 acres in the period 1974 to 1980; roughly 47,000 by public agencies and 38,000 by private investors. In addition intensive agriculture should be introduced onto an estimated 36,000 acres of legally occupied land.
- (3) That highly organised efforts should be concentrated into selected areas to create nuclei of development from which further expansion can take place. The remaining areas should continue to receive the present level of agricultural expansion input.
- (4) That all agricultural development should be based on a reasonable degree of diversification of enterprise.

The main crops should be oil palms and rubber and to a lesser degree cocoa. In addition certain selected small-scale enterprises should be undertaken, the most important of which are rice and pepper planting, market gardening and rearing of pigs and poultry.

A commercially run beef cattle ranch should be established in the Study Area with the object of creating a foundation herd of cattle as a basis for a stratified beef industry in Sarawak.

Intensive agricultural development should take various forms comprising:

on unencumbered State Land,

- estate-type enterprises undertaken by Government and private enterprises,
- smallholder settlements undertaken by Government,
- medium and small private farms,

on legally occupied land,

- road based improvement schemes.

The Government estate-type enterprises should be sufficiently large to support adequate management and to produce sufficient raw material to ensure efficient operation of processing plants.

On smallholder schemes each farmer should be allocated at least two separate plots of land each planted to a different main crop in addition to a homestead and a rice plot each of one acre. A holding should total about 16 to 17 acres which is capable of generating a sufficient repayment capacity to cover development costs and interest and give a typical farmer with an average family an annual cash income of about \$2,000 and a subsistence income valued at approximately \$500 from the rice and homestead plots.

In the rural villages market garden activities should be a main source for home consumption. In areas close to towns market gardening, fruits and small stock rearing should become major enterprises aimed at supplying the increasing urban populations.

- (5) That all agricultural development should be based on principles of sound land use. Semi-detailed soil surveys, soil mapping, land use planning and boundary demarcations should precede all agricultural development.

The main aspects of land use planning should be:

- that in general oil palms should be planted on the more easily accessible and undulating land—maximum slopes generally not exceeding 20 degrees;
- that rubber should be planted on the less accessible areas and the steeper land—maximum slopes up to 25 degrees;
- that cocoa and the villages themselves with their house plots should be placed on the best gently sloping lands;
- that rice should be confined to the flat valley land.

- (6) That all land developed and managed by SLDB as public estates should be developed to a diversified cropping pattern so that if desirable it could ultimately be divided into smallholdings comprised of more than one main crop.

SLDB should be the prime Government development agency for estate-type enterprises and smallholder schemes. It should operate in two phases, covering Development and Management.

The Development Phase should include clearing of the land, planting of permanent crops and maintenance of them up to a specified stage, and the establishment of central processing and marketing facilities for the crops planted.

The Management Phase should begin when the main permanent crops reach maturity. At this stage SLDB management should split. On the areas planned to remain as public estates SLDB would for the foreseeable future continue managing them using paid labour.

The areas presently planned for smallholders should be divided into individual holdings and allocated to the families who have been working on the land during the development period and have thus proved their suitability as smallholder farmers.

- (7) That the Agricultural Research Organisation in the Study Area should undertake practical investigations into problems directly associated with development in the Area.

The work would be undertaken at:

- the existing Kabuloh Research Station.
- the existing Paya Selanyau Rice Testing Station,
- a Livestock Production and Animal Husbandry Training Centre planned by Government to be established in the Study Area starting in 1975,
- an agricultural university farm which is planned by Government to be established in the Study Area in the near future.

- (8) That Government establishes a new organisation within the Department of Agriculture—the Agricultural Development Unit (ADU)—to provide extension, credit, supply and marketing services to all the small-scale farmers in the intensive development areas.

The ADU staff should be specially trained and organised into teams which would be stationed in Agricultural Centres in the villages close to the farmers they serve.

The Department of Agriculture's present efforts in the remainder of the Region should be continued, directed particularly towards preventing soil deterioration, increasing food production and preparing the people for their eventual incorporation into intensive schemes.

1.2 FISHERY PROGRAMME

The fishery programme aims at:

- (1) Obtaining information for further development of the sea fisheries off the Sarawak coast.
- (2) Developing inland fisheries in order to improve nutrition among the rural population and contribute to their income.

In order to attain these aims it is recommended:

- (1) That a comprehensive study of the fishery potential of the whole of Sarawak's coast waters be undertaken.
- (2) That in the rivers and lakes efforts be made to re-establish and preserve conditions conducive to fish production.
The devastation and extensive practice of using fish poisons (often modern insecticides) should be controlled.
The pollution of the waters resulting from soil erosion should be progressively diminished. The recommendations made elsewhere in the Report for minimising soil erosion would have significant consequences for river fishery potential.
- (3) That promotion of aquaculture should continue.
Particular opportunities exist for pond culture of fish, giant freshwater prawns and Taiwan turtles.
- (4) That a study for preserving and using more efficiently the high fish production of the freshwater lake Loagan Bunut be carried through.

1.3 THE FORESTRY AND CONSERVATION PROGRAMME

The forestry and conservation programme aims at:

- (1) Creating a basis for a sustained yield of timber in the Study Area.
- (2) Preserving the ecological balance in the Region.
- (3) Substituting the existing large-scale log export by a large-scale industrial processing of timber for export and local use thereby increasing the number of jobs in the Region and increasing revenue.

To achieve these aims it is recommended:

- (1) That the timber resources of the Region be more intensively used.

The forest units identified by the FAO Team should be developed as large industrial timber complexes. Their locations and expected throughputs would be as follows:

- Near Bintulu working a forest area of about 176,000 acres north of Bintulu. The planned throughput by 1980 is 5.3 mn cubic feet and ultimately 7.2 mn cubic feet per year.
- At the junction of the Miri-Bintulu and Labang roads, working a forest area of about 257,000 acres. The planned throughput by 1980 is 4.1 mn cubic feet and ultimately 7.5 mn cubic feet per year.
- On the Miri-Bintulu Road between the Niah and Suai Rivers, working a forest area of about 197,000 acres. The planned throughput by 1980 is 4.0 mn cubic feet and ultimately 7.5 mn cubic feet per year.
- At Long Lama, working a large forest concession outside the Study Area, the planned throughput by 1980 is 5.5 mn cubic feet and ultimately 7.0 mn cubic feet.

Auxiliary industrial units should be established based partly on products from the complexes and partly on timber production from forest areas outside the FAO identified areas.

The practicability of using mixed tree species in the wood chip market should be explored so that the fullest possible use could be made of timber from forest land allocated to agriculture.

- (2) There should be considerable realignment of Forest Reserve boundaries.

This would eventually result in:

- about 665,000 acres of logged forest land presently outside the Forest Reserves being incorporated into future Forest Reserves;
- about 170,000 acres of land at present inside Forest Reserves or Protected Forests being developed to agriculture.

The overall result of the realignment would be an increase in the total area of Forest Reserves by about 500,000 acres.

- (3) That investigations recommended by Dawkins in 1970 relating to silvicultural practices in the harvesting of mixed dipterocarp forests be carried through.

Particular emphasis should be given to investigations of afforestation methods for all presently occupied land assessed as unsuitable for agriculture. These studies should cover the possibilities of forest farming whereby the labour for all forestry work could be supplied by the people previously cultivating the land.

- (4) That logging methods which minimise soil erosion be adopted and that strict standards for alignment and drainage of logging roads are enforced.

The Government should construct or supervise the construction of the permanent main roads required in present virgin forest areas destined for agricultural development before logging begins.

- (5) That research programmes relating to land preservation be carried through.

The Government should set up a small soil conservation unit, possibly as a joint venture between the Ministry of Agriculture and the Ministry of Lands and Mineral Resources.

- (6) That ecologically sensitive areas be excluded from agriculture and intensive forestry activities.

It is recommended:

- that shifting cultivation be reduced progressively;
- that National Parks be established at Niah, Similajau, Loagan Bunut, Lambir and Sungai Dalam in accordance with proposals previously submitted to Government;
- that Conservation Areas be established at Tanjung Lobang, Bukit Dulit and Lobang Salai;
- that a special section of the Forest Department be established to be responsible for the research and management functions of national parks and similar protected areas.

1.4 THE URBANISATION PROGRAMME

The urbanisation programme aims at:

- (1) Restructuring the society by accommodating an increasing share of the population throughout the region in urban areas. The percentage of the population living in the urban areas is expected to increase from 35 per cent in 1970 to 50 per cent in 1990.
- (2) Eradicating the inequality between rural and urban people by increasing the level of public and private services and utilities in new and existing settlements in the rural parts of the Study Area.
- (3) Creating attractive, diversified and well-arranged urban environments.
- (4) Building up Miri and Bintulu as the major growth poles of the Region.

Measures recommended to achieve these objectives include:

- (1) Urbanisation of the rural areas through creating new towns and villages so located as to form a mutually supporting system of centrally located towns surrounded by satellite villages.

By 1990 it is planned to create:

- 26 new villages,
- 4 new Service Centres,
- 2 new Sub Regional Centres.

The locations of these are shown on the Regional Plan Map (at the end of the report).

The villages and town should be connected by roads and serviced by a bus system.

The typical village should:

- have populations ranging between 1,500 and 2,000 people;
- be inhabited mainly by smallholder farmers living in low cost housing on one acre homestead plots grouped in neighbouring units;
- be surrounded by an agricultural area of ideally about 5,000 acres, but limited by a maximum walking time of about half an hour from the village;
- contain primary education, a police post, a postal agent, a community hall and four to five shophouses.
- be supplied with treated water and have adequate sewerage facilities (pit latrines on one acre homestead plots and a small community sewerage system in the village centre). Subsequently and by stages the village should be supplied with electricity and telecommunications.

The typical Service Centre should:

- have populations ranging between 4,000 to 5,000 people and consist mainly of agricultural workers employed on public estates. They should live in low cost houses on one quarter acre homestead plots.
- be surrounded by an agricultural area of ideally about 10,000 acres, but actually limited by a labour transport vehicles travel time of about half an hour; a distance of roughly 6.5 miles from the centre;
- contain, primary and lower secondary education, a community health centre, a minor police station, a post office class C, religious buildings, a community hall, shops and coffee houses, small-scale industries and processing facilities for the major crop products in its catchment area;
- be supplied with treated water, electricity, telecommunications, adequate sewerage facilities, proper drainage, street lighting and garbage disposal services. There should be organised transport for taking the agricultural workers to and from work.

The typical Sub Regional Centre should:

- have populations ranging between 7,000 to 8,000 people;

- be inhabited in the initial phases mainly of workers employed on public estates and large timber complexes. They should live in low cost houses on one quarter acre plots.
- be surrounded by an agricultural area of ideally about 15,000 acres, but again limited by a 6.5 miles distance from the Centre;
- contain, in addition to the amenities listed for a Service Centre, a lower and upper secondary school, a sub district office, and the community health centre upgraded to a health sub centre. There should be some additional medium sized industries and possibly a timber processing complex. The transport for the agricultural workers, the public utilities and processing facilities for agricultural products should be as for a Service Centre.

(2) That the populations of the regional centres Miri and Bintulu should range between 40,000 and 55,000 people by 1990. The centres should contain higher order public and private services, and have a diversified employment structure with manufacturing and services as the main employment.

For Miri it is recommended:

- that further town planning, based on the outline plan in this Report, be carried out;
- that a feasibility study for the improvement of Miri port be undertaken;
- that a feasibility study for improving the sewerage and refuse disposal systems be carried out;
- that an iron foundry and two industrial estates with facilities for small and medium scale industries be established;
- that a new general hospital, a vocational training school and a number of public and private services be established.

For Bintulu it is recommended:

- that town planning based on an outline plan, presented in this Report be carried out;
- that the trunk road system to Tanjung Kidurong be constructed immediately;
- that a feasibility study for a new airport be carried out sometime during the period of the Third Malaysia Development Plan;
- that a new university and a general (possibly regional) hospital be established;
- that a glass container manufacturing plant, and industrial estate for small-scale industries, a series of wood based enterprises and a Timber Centre to promote the processing, product development and marketing of local timber be established.

(3) That the Government, through town planning, takes the initiative in determining broadly the character and quality of the future towns and villages but leaving ample scope for local initiative to form the final image of the settlement.

The main principles governing the planning of new villages and towns should be:

- a lay-out of areas for specific purposes (residential, commercial, etc.) so as to allow orderly growth according to the varying needs and capacities of the society;
- a low density of houses per unit area of residential land in order to provide an environment and atmosphere that will stimulate and encourage people to improve and maintain their houses and surrounding land. In new villages on smallholder settlement schemes a density of one house per acre is recommended, in larger urban centres four houses per acre;
- the early establishment in each village of shops, schools, health centres, facilities for workshop and recreation and social meeting places. Then, later and by stages, piped water, electricity and adequate facilities for sanitary disposal should be provided.

1.5 THE HOUSING PROGRAMME

The housing programme aims at:

- (1) Providing suitable housing for the growing population, especially for people migrating to new urban and rural areas.
- (2) Establishing a housing production industry which can satisfy the demand at reasonable costs without major Government subsidies.

In order to attain these aims it is recommended to:

- (1) Rationalise the existing construction industries.
This would include introduction of new materials and methods to stimulate cheaper but more effective housing construction to replace current outdated systems.
- (2) Control cost of construction and building materials.
The existing limits to free competition between ten main contractors should be removed. Price raising agreements should be countered by establishing stronger cost control in government tenders, and a government agency should enter the construction sector to introduce a new element of competition.
- (3) Establish a new industry for mass production of low cost houses.
It is recommended that a plant for making prefabricated houses be started, based on existing and future timber processing industries.

1.6 THE INDUSTRIALISATION PROGRAMME

The industrialisation programme aims at:

- (1) Creating jobs.
- (2) Increasing the high productivity elements of the economy and thereby contributing to the growth in GNP and personal incomes.

To attain these aims it is recommended:

- (1) That industries be developed in the Region to process the local raw materials and the number of import substituting industries be increased.

It is recommended that the following be established:

- a glass industry based on the silica sand near Bintulu;
- an iron foundry in Miri;
- a series of wood based industries augmenting those timber complexes recommended under the Forestry Programme including a modern sawmill, drying kilns, moulding plants and timber preservation plants;
- an industry for the manufacturing of prefabricated houses.

(2) That special industrial estates are systematically planned and built up to accommodate industries and services.

Three industrial estates are recommended, two in Miri and one in Bintulu—catering mainly for small-scale industries but also open to medium-scale units.

(3) That the Government carry out industrial research, promotion and implementation programmes.

It is recommended:

— that the Sarawak Economic Development Corporation (SEDC) takes the lead in promoting industrialisation in the Study Area and in Sarawak as a whole. This should cover both large and small-scale industries and include market development, industry identification and participation;

— that the Sarawak Timber Industry Development Corporation (STIDC) should promote wood based industries.

(4) That the Government takes steps to educate a local industrial labour force. Specific recommendations for this are given later in this chapter under the Human Resources Programme (Section 1.9).

1.7 PRIVATE SERVICES PROGRAMME

The private services programme aims at:

Providing the region with adequate commercial service facilities increasing concurrently with the population and the rise in the overall service level.

In order to attain this aim it is recommended:

(1) That urban areas be systematically planned and built up to accommodate the private services in question. (See the Urbanisation Programme).

(2) That private services be supported by extension service programmes. SEDC should establish a special section, including a permanent extension service—for the promotion of small-scale commerce, covering facilities for financial aid and technical and commercial training.

1.8 THE TRANSPORT DEVELOPMENT PROGRAMME

The transport development programme aims at:

(1) Expanding the road network of the Region to include all development areas and major population centres.

- (2) Making the transportation of persons and commodities within, and to and from, the Region more effective and cheap.

To achieve these aims it is recommended:

- (1) That 48 miles of trunk roads and 264 miles of public secondary roads be constructed by 1990.
- (2) That a feasibility study for a road connecting Marudi with Miri through Bakong Village be carried out.
- (3) That the Government considers an improvement and expansion of the sea and air terminal systems of the Region.

It is recommended that a feasibility study be carried out for the location and construction of a new airport at Bintulu as well as the current feasibility study being carried out on the construction of a deep sea port near Bintulu and improving the coastal port at Miri.

- (4) That the Government takes an active role in developing, guiding and controlling the transport industry (bus and lorry establishments, shipping companies, airlines, etc.).

It is recommended that the Government should:

- control and regulate the entry of firms into the transport business so as to ensure that only sufficiently skilled, responsible and financially sound operators participate, and that each operator has a sufficiently large share of the trade to permit efficient operation of suitable equipment;
- enter into joint ventures to establish efficient transport organisations where private enterprise has not proved adequate, or where a transport system is required for development purposes but is unlikely to prove economic for some years.
- control quality and prices of the services rendered by the transport industry. Prices for transport services should generally be based on the cost of providing the service on a long-term basis. However, exceptions to this rule should be considered in situations where for social reasons, it would be appropriate to subsidise a service, for instance in the case of remote villages. This cost-price principal should also be used for the various types of goods being transported;
- arrange courses for training transport operators and workers;
- establish a Sarawak Port Authority with the responsibility of operating all major ports of the State;
- support the public road transport in the Region and the river transport within and to and from remote river areas.

To attain this the present licence fee policy which favours private cars should be changed in favour of buses; also a full or a limited supply of tax-free gasoline should be given to owners of outboard motors in remote river areas. Such a concession could decrease the total longboat transport costs, for example, by 30 to 40 per cent and improve the prospects of people in these areas marketing their produce at competitive prices.

- (5) That part of the road network should be constructed to allow for vehicles with 10/16 tons axle loads on single/tandem axles to carry heavy timber and other bulk transport.

1.9 THE HUMAN RESOURCES PROGRAMME

The human resources programme aims at:

- (1) Minimising the human and social difficulties combined with migration and resettlement.
- (2) Creating an adequately trained and skilled labour force, whether manual, technical or managerial.
- (3) Bringing workers and jobs together.

To achieve these aims it is recommended:

- (1) That prospective migrants be carefully informed.

Prospective migrants should be given as detailed a picture as possible of the situation they are likely to encounter in their new settlement through careful briefings and publication of accurate information material.

- (2) That versatile assistance and support be given to migrants in their new settlements.

Social welfare personnel should be stationed in development areas to assist settlers in the adjustment to the new environment.

- (3) That studies be carried out of the adaptation of early migrants to their new environment.

A joint research committee should be formed to study this subject comprising senior representatives from the State Manpower Section, the Sarawak Land Development Board and the Departments of Agriculture and Social Welfare.

- (4) That the Vocational training system be expanded.

A further vocational school be established at Bintulu in addition to the one which is nearing completion at Miri. Programmes of the schools should concentrate on short specialised courses designed to teach particular skills and provisions of on job training.

- (5) That labour registration and recruitment offices be established throughout the State.

The offices should arrange the contact between employers and employees and keep the Kuching Head Office informed of the supply and demand for various types of labour.

- (6) That the State Manpower Section of the Federal Ministry of Labour be reorganised and strengthened to deal effectively with the activities proposed above.

1.10 REGIONAL ECONOMICS AND FINANCE

The macro-economic survey presented in Chapter 2 Section 2.4 and in Supporting Report 9 gives an overall picture in money terms of the future of the Region resulting from all economic activities, whether directly included in the Plan or not.

It appears from this survey that considerable funds for investment in new public and private enterprises will be needed. This will call for:

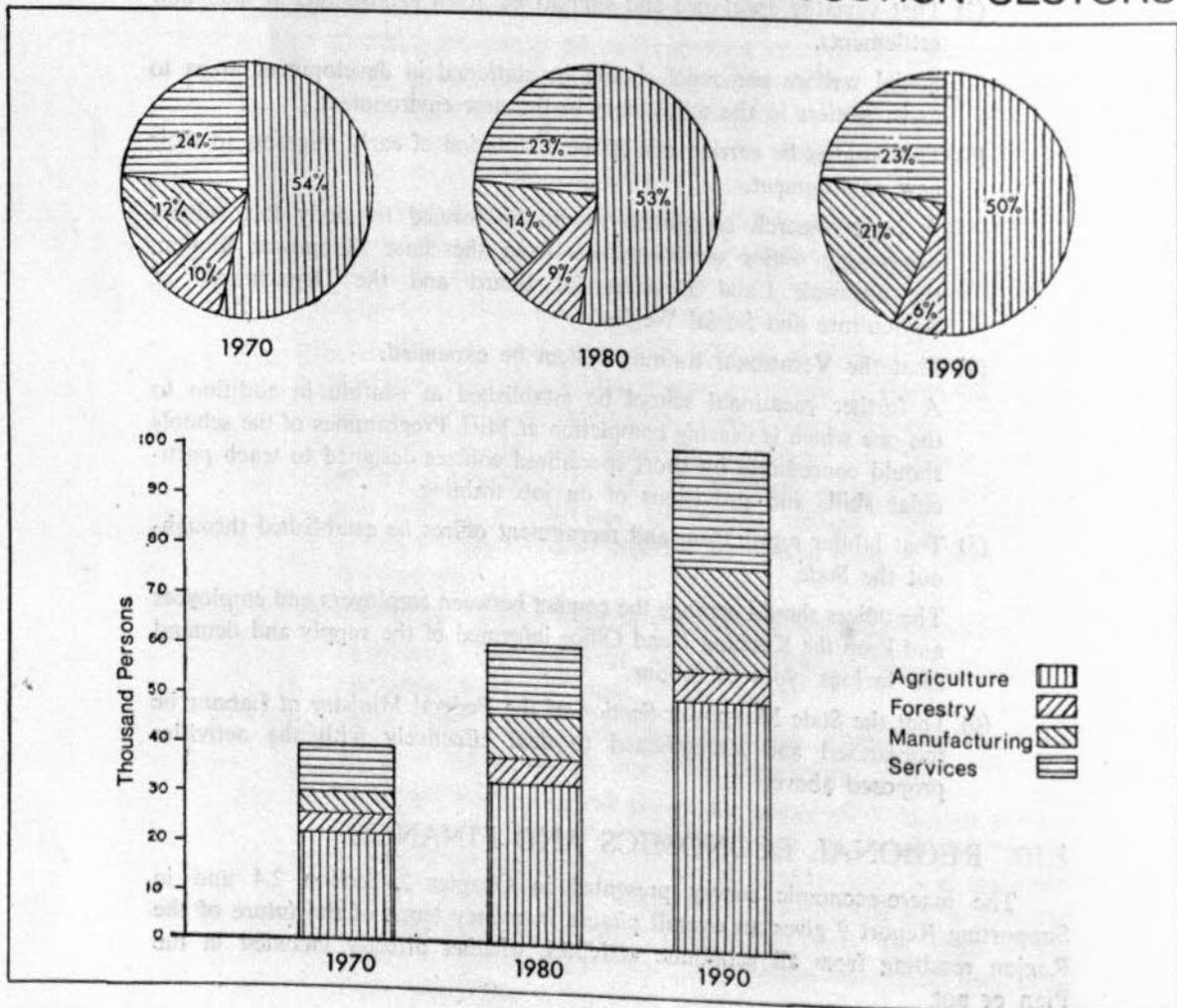
- increased public revenues;
- increased private savings.

In order to encourage and increase the latter the Consultants have recommended that consideration should be given to the establishment of:

- A Sarawak Savings and Development Fund, which would receive savings deposits from the people and invest the money in development and social projects in such a way that the deposits would be secured against loss from inflation. This would provide an alternative to the present savings in land and gold;
- Premium Bonds, a kind of a public lottery, where the participants would always get their original stake—the Premium Bond—repaid, while the gambling element would be the distribution of the total interest less administrative costs.

FIGURE 1-1

DISTRIBUTION OF LABOUR BY MAIN PRODUCTION SECTORS



In addition to these proposals and to some extent with the same purpose—
Government is recommended to consider;

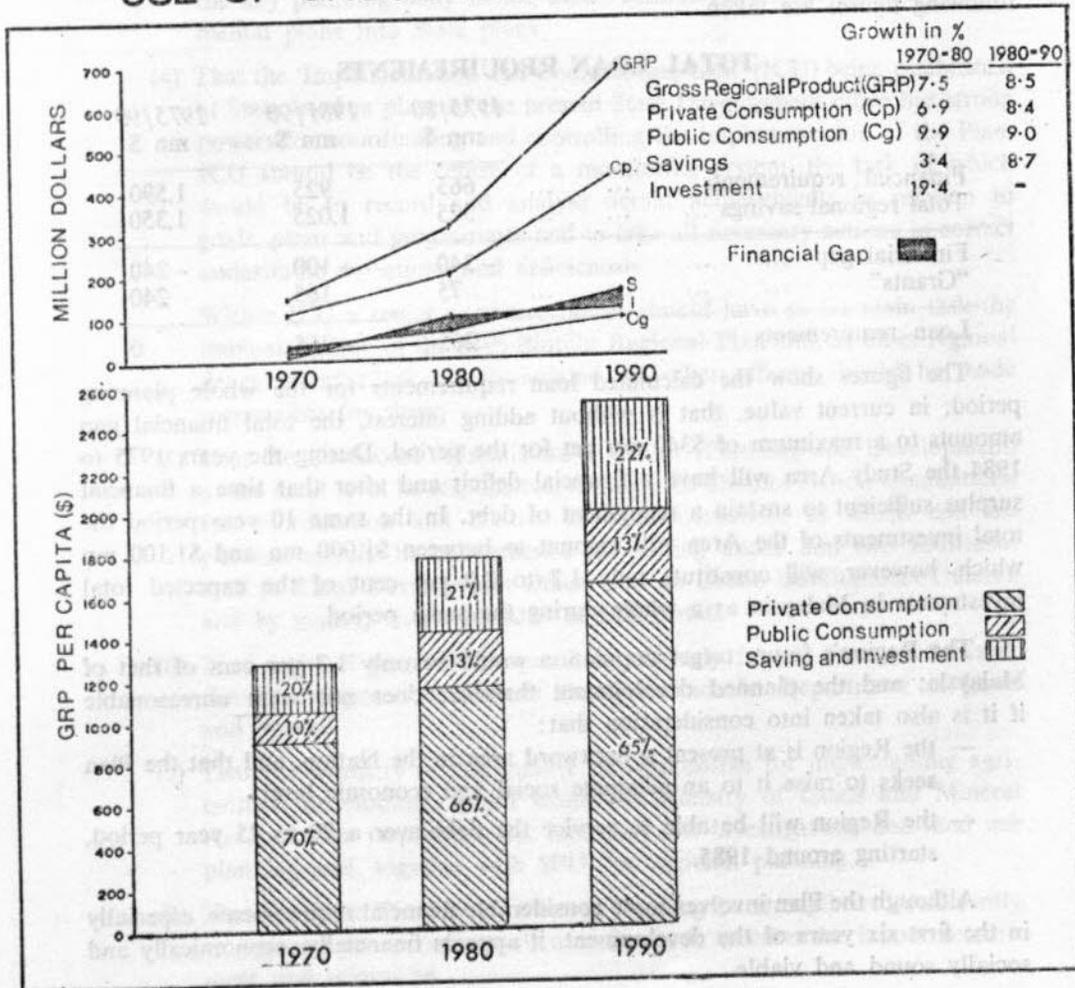
- a system of Land Rent, which, in addition to providing revenue from possession and utilisation of land, aims at reducing or abolishing land speculation and at establishing a flexible system of land administration.

The development targets with respect to the Region's employment and Gross Regional Product (GRP) are seen in the Figures 1.1 and 1.2 which include:

- a growth of the total number of employed from about 40,000 in 1970 to 60,000 in 1980 and 100,000 in 1990;
- a growth of the GRP per employed from about \$3,800 in 1970 to about \$5,100 and \$6,900 respectively in 1980 and 1990;
- a growth of GRP from about \$150 mn in 1970 to \$690 mn in 1990.

FIGURE 1.2

USE OF GROSS REGIONAL PRODUCT



This planned development further implies:

- that the public consumption, which comprises such items as recurrent expenditure on education, health, administration and police, would grow at a faster rate than the GRP, indicating the increasing importance of public services;
- that total savings within the Study Area would grow at a slightly faster rate than GRP—cause of the relative modest growth rate of total savings is that the savings' share of GRP already is quite considerable. In fact total savings have by far exceeded total investments in recent years.
- that private consumption would grow at a lower rate than the GRP. This is a consequence of public consumption and total savings growing faster than GRP. Nevertheless the consumption per capita would be more than 80 per cent higher in 1990 than in 1970.

The financial gap arising from the financing of the planned development raises two interrelated questions, namely; can the Plan be considered realistic with a financial gap of this size?; and what would the financial consequences be of liquidating this debt under certain assumptions with respect to repayment period and payment of interest?

These matters are further discussed in Chapter 2 Section 2.4, whence the following figures are taken.

TOTAL LOAN REQUIREMENTS

				1975/80 mn \$	1981/90 mn \$	1975/90 mn \$
Financial requirements	...	...	...	665	925	1,590
Total regional savings	...	...	...	325	1,025	1,350
Financial gap	...	...	...	-340	+100	-240
"Grants"	...	...	...	75	165	240
Loan requirements	...	...	...	265	-265	0

The figures show the calculated loan requirements for the whole planning period; in current value, that is without adding interest, the total financial gap amounts to a maximum of \$340 mn net for the period. During the years 1975 to 1984 the Study Area will have a financial deficit and after that time a financial surplus sufficient to sustain a repayment of debt. In the same 10 year period the total investments of the Area will amount to between \$1,000 mn and \$1,100 mn which, however, will constitute only 1.7 to 2.0 per cent of the expected total investments in Malaysia as a whole during the same period.

The Region's future target population would be only 1.7 per cent of that of Malaysia; and the planned development therefore does not seem unreasonable if it is also taken into consideration that:

- the Region is at present a backward area in the Nation, and that the Plan seeks to raise it to an adequate social and economic level;
- the Region will be able to service the debt over a 20 to 25 year period, starting around 1985.

Although the Plan involves some considerable financial requirements, especially in the first six years of the development, it appears financially, economically and socially sound and viable.

1.11 ORGANIZATION FOR DEVELOPMENT

The organisation programme aims at:

- (1) Using to the fullest possible extent the existing Government organisation, which is sound and forms a good basis for expansion.
- (2) Making the best possible use of relatively limited trained senior executive staff available in Sarawak.

In order to achieve these aims it is recommended:

- (1) That the present organisation for development in Sarawak, together with improvements already suggested by the Sarawak Government should be the foundation on which a State-wide planning and implementation organisation is built.
- (2) That full use be made of all existing development organisations such as the Sarawak Land Development Board, the Sarawak Economic Development Corporation and the Government Departments so that their normal works in the Region become integral parts of the Plan implementation.
- (3) That the State Planning Unit (SPU) is strengthened in its position as the key planning body in the State, combining Divisional and Departmental plans into State plans.
- (4) That the 'Implementation and Coordination Unit' (ICU) being established at State level in place of the present State Development office has strong powers for coordinating and controlling the implementation of the Plan. ICU should be the centre of a monitoring system, the task of which would be to record and analyse actual achievements in relation to goals, plans and programmes and to take all necessary actions to correct undesirable variations and deficiencies.

Within ICU a senior executive officer should have as his main task the implementation of the Miri-Bintulu Regional Plan and, as other regional development plans are formulated, so other officers should be made responsible for them.

- (5) That the Divisional Administrative Officer (Planning and Development) at the local level be responsible, through the District Action Committees, for coordination and control of implementation, to which end his position should be strengthened by putting under him two additional staff (a Rural Development Officer and an Urban Development Officer), and by making him a member of ICU's staff.
- (6) That regional plans be prepared successively for all parts of Sarawak through cooperation between the SPU and the Department of Land and Survey.
- (7) That the Ministry of Agriculture be responsible for implementing agricultural development plans while the Ministry of Lands and Mineral Resources be responsible for land and soil investigations and land use planning and, together with SPU, for regional planning.
- (8) That the State Manpower Office in Kuching be strengthened sufficiently to organise branch offices all over Sarawak to cater for labour recruitment and migration.

CHAPTER 2

THE REGIONAL PLAN

2.1 GOALS AND STRATEGIES

2.1.1 Introduction

The establishment of goals and strategies for development in the Study Area necessarily involves decisions of a political nature. For that reason discussions between the Consultants and the Governments concerning desirable and acceptable goals and strategies were carried out during, and immediately upon completion, of Phase I of the Study. These discussions were held at Steering Committee meetings and at separate meetings with representatives of the Economic Planning Unit in Kuala Lumpur. The indications of Government thinking emerging from these discussions have served as guidelines for the Consultants' work during Phase II. Discussions were based on the following documents produced by the Consultants:

- Development Strategies (Dec. 1972);
- Alternative Strategies for Rural Development (Jan. 1973);
- The Human Factor In Development (Jan. 1973);
- The Perspective Plan (March 1973).

In this chapter the character of the Plan is described and a summary of the goals and strategies is given.

2.1.2 Character of the Plan

The Scope of Work clearly indicates that the Plan resulting from the Study should be an integrated and comprehensive one incorporating spatial, physical, economic, social and political factors. Thus all sectors of the social economy—public as well as private—should be included in the Plan with the aim of reaching a balanced overall development. This would include the location of present and future human settlements, structures and roads to fit in with the natural resources. The factors acting as constraints to development would be identified, cost-benefit studies would be made for certain individual enterprises, and an analysis made of the distribution of the necessary funds between the public and private sectors.

The Plan presented by the Consultants is divided into:

- the Regional Plan 1975-1990, and
- the Action Programme 1975-1980.

The Regional Plan is not intended to be a final programme for development up to 1990; it aims at establishing a reasoned basis on which major decisions influencing future development, including the Action Programme, can be made.

The total procedure is illustrated in the Planning Process Diagram which, as is shown in Figure 2.1, is divided into three main components:

- (i) Establishment of Goals.
- (ii) Programme and Implementation.
- (iii) Control and Review.

The planning process must be continuous and flexible; changes will have to be made as new resources are created, new and improved information obtained and fresh ideas and wishes developed. During the Study the Consultants have taken the process as far as the Stage II, and they have indicated a system meeting the requirements of the Third Stage. The first Stage (the Establishment of Goals) was covered in Phase I and presented in the Perspective Plan, where the wishes, ideas and aspirations of the people were weighed against the feasible potentials and acceptable means of achieving them as they appeared to the Consultants at that stage. Based on subsequent discussions in the Steering Committee and with individual Departments, and Government Officers, an attempt was made to identify realistic objectives: that is, objectives which could be achieved by a number of inter-related projects that could be carried out within the constraints governed by natural resources, manpower, available finance etc., and using measures which Government could accept.

Phase II of the Study has been mainly concerned with the second Stage, where strategies chosen as a result of Phase I are built into programmes of action to be undertaken in the near future. Although the Plan, as it is presented in this Report, is for practical reasons based on specific strategies and assumptions in line with present Government thinking, this does not imply any final commitment by Government to them. Changes can and should be made, as is indicated by Box III in the diagram, and alternative possibilities have been suggested in the Report whenever it has been considered appropriate to do so.

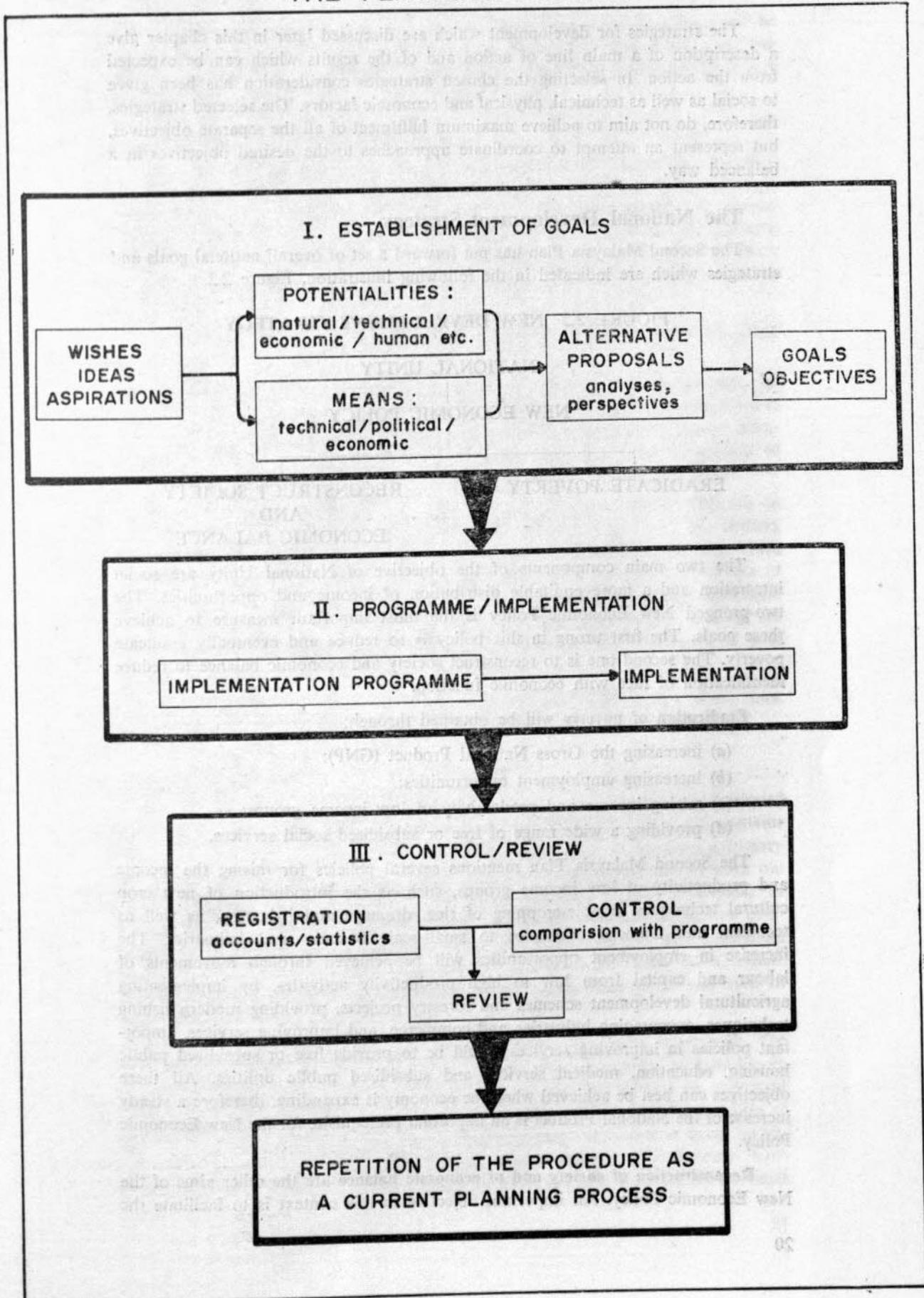
2.1.3 Goals

The goals or objectives of the future development in the Study Area are clearly stated in the Scope of Work (see Appendix D). The Government selected the Study Area for regional planning because it contained extensive natural resources of forest and land suitable for agriculture not yet utilised and, as a general guideline for Consultants, the Scope of Work referred to the development plans put forward for the Johor and Pahang Tenggara Regions of Peninsular Malaysia.

The main emphasis for development was to be on agriculture and forestry and the settlement of people from the First, Second and Third Divisions, where a rapidly rising population was causing serious land deterioration by the extensive practice of shifting cultivation. Diversification of agriculture away from the present heavy reliance on rubber should be a major objective, and the processing of agricultural products should, as far as possible, be undertaken within the Region. The utilisation of the forests should aim at creating a timber processing industry in Sarawak to replace the present huge export of raw logs; in this respect the Consultants were to co-operate closely with a UNDP/FAO sponsored Forest Industries Development Team, which had already worked in Sarawak for three years and had surveyed the majority of the uncommitted forest resources in the Study Area.

The general development plan should also include other manufacturing industries, private and public services, and should provide new urban areas with modern amenities, including the extension of communications and transport networks, terminals and ports. Finally, the Plan should cover such aspects as overall phasing, financing, organisation, management and training of manpower and staff. The significance of these objectives needs to be gauged in relation to the overall National and State development aims.

THE PLANNING-PROCESS

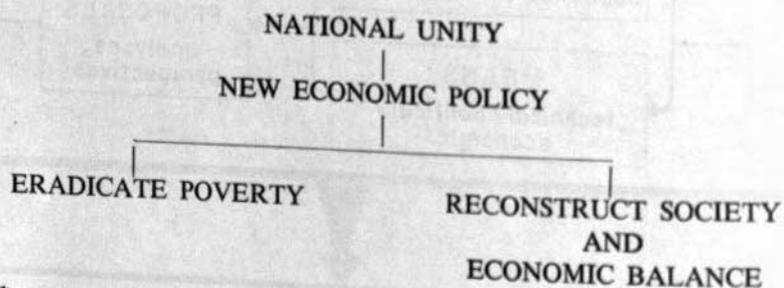


The strategies for development which are discussed later in this chapter give a description of a main line of action and of the results which can be expected from the action. In selecting the chosen strategies consideration has been given to social as well as technical, physical and economic factors. The selected strategies, therefore, do not aim to achieve maximum fulfilment of all the separate objectives, but represent an attempt to coordinate approaches to the desired objectives in a balanced way.

The National Development Strategy

The Second Malaysia Plan has put forward a set of overall national goals and strategies which are indicated in the following illustration, Figure 2.2.

FIGURE 2.2 NEW DEVELOPMENT STRATEGY



The two main components of the objective of National Unity are social integration and a more equitable distribution of income and opportunities. The two-pronged New Economic Policy is the most important measure to achieve these goals. The first prong in this policy is to reduce and eventually eradicate poverty. The second one is to reconstruct society and economic balance to reduce identification of race with economic function.

Eradication of poverty will be obtained through:

- (a) increasing the Gross National Product (GNP);
- (b) increasing employment opportunities;
- (c) raising income and productivity of low income groups;
- (d) providing a wide range of free or subsidised social services.

The Second Malaysia Plan mentions several policies for raising the income and productivity of low income groups, such as the introduction of new crop and cultural techniques, double-cropping of rice, drainage and irrigation, as well as technical and financial assistance to small-scale business and industries. The increase in employment opportunities will be achieved through movements of labour and capital from low to high productivity activities, by implementing agricultural development schemes and forestry projects, providing modern fishing techniques, encouraging industries and commerce, and improving services. Important policies in improving services would be to provide free or subsidised public housing, education, medical services and subsidised public utilities. All these objectives can best be achieved when the economy is expanding, therefore a steady increase of the National Product is an important prerequisite for the New Economic Policy.

Reconstruction of society and of economic balance are the other aims of the New Economic Policy. An important objective in this context is to facilitate the

access of all races to the commercial and industrial community. This will be obtained through a more active participation of the Government in the establishment and operation of productive enterprises, in the modernisation of rural life and a rapid and balanced growth of urban activities.

Development of Sarawak

Generally Sarawak identifies itself with the goals and strategies mentioned above. Sarawak has developed at a different rate to Peninsular Malaysia, although the pace of development in recent years has increased considerably. A general development goal for Sarawak is to bring the State on a level with development in the rest of the Nation by utilising more fully its human and natural resources. In this development the following particular problems and obstacles must be overcome:

- (a) the relative remoteness of Sarawak from the major markets and trade lines of the world;
- (b) a relatively small local market which has been unable to provide the incentive for the establishment of major enterprises supplying this market. Furthermore, the relatively poor internal and external transport infrastructure (roads, ports) have been an impediment to the integration of dispersed local markets;
- (c) a large share—70 to 80 per cent—of the population at present depends on a primarily subsistence farming economy based mainly on the shifting cultivation of hill rice. In many parts of the First, Second and Third Divisions of Sarawak the increasing population has led to a decrease of the fallow period in this farming system and accordingly to a deterioration of the farmed land. There is therefore an increasing need in Sarawak for a rational and careful utilisation of all the available resources of land suitable for agriculture.

Short and long-term solutions to these problems in Sarawak as a whole must also be an integral part of any development plan in the Study Area.

The Study Area

In a Sarawak context the Study Area has been occupied, settled and developed later than the areas to the south. For that reason the Study Area still contains large areas of unoccupied State Land suitable for agriculture. It has been a primary objective of this Study to identify such land, gauge its potentials and to work out suitable plans for its development. The farming system should be capable of supporting a large number of people on an acceptable level of real income commensurate with the general development goals. The participants in the development should, to a large extent, come from those areas outside the Study Area, which, as mentioned above, are facing problems of decreasing crop yields and even of availability of suitable agricultural land.

The vast timber resources of the area should be used more intensively. The existing large-scale log export should be phased out as rapidly as possible in favour of large-scale local industrial processing of logs for subsequent export of timber products in order to create jobs and income in Sarawak. The creation of large forest industry complexes aimed at achieving these objectives is being undertaken by the recently established Sarawak Timber Industry Development Corporation (STIDC) which is already negotiating with the first investors on the basis

of identification and planning work carried out by the UNDP/FAO Forest Industries Development Team.

Estimates, presented in Section 2.2, showing the likely number of jobs that will be created by the agricultural and forestry developments demonstrate that if the Study Area is to make a worthwhile contribution to solving the social problems in other parts of Sarawak, then industrialisation must be increased considerably in order to create more jobs. There will be need to develop production sectors with high production value per worker so that the Gross National Product (GNP) can grow more rapidly. The industries will primarily be those based on local raw materials, such as timber, and local produce, such as rubber and palm oil.

In addition local production of those consumption and production goods and services which can be provided by small-scale industries and workshops must be progressively increased to help supply the whole Sarawak market.

The increasing population and production in the Study Area will both necessitate and facilitate an increasing urbanisation, i.e. an increasing share of the population will be living in towns and obtaining a livelihood from industry, commerce, transport and other private and public services. By careful location of new towns and villages the urban amenities and services will be made available also to the rural communities. Thus rural life will be improved which will help limit the migration of people to the main urban areas to a volume compatible with the maintenance of a high percentage of employment in the towns.

Apart from major oil and natural gas resources in off-shore areas adjacent to the Study Area, and outcrops of limestone within it, there are no known mineral deposits of any economic significance. The development of oil and natural gas resources is undertaken by Sarawak Shell Berhad in cooperation with the Governments and will be planned in detail by these two parties. For this reason and because of lack of fundamental information these activities are not included in the Consultants' Plan apart from estimated derived effects on demand for local labour, goods and services.

It should be mentioned that the most accessible limestone outcrops (at Niah) form what has been described as a National Monument of the greatest archaeological and scientific interest, and the exploitation of the Niah limestone raises serious issues discussed in Volume II Chapter 4 of this Report.

2.1.4 Constraints

Development towards the abovementioned goals will encounter certain constraints, some of which can be wholly or partly overcome by appropriate measures. The resources, the constraints and the recommended means to achieve a realistic development of the country are described in the following chapters of this Report and in the Supporting Reports. Given below is a short summary of the main constraints.

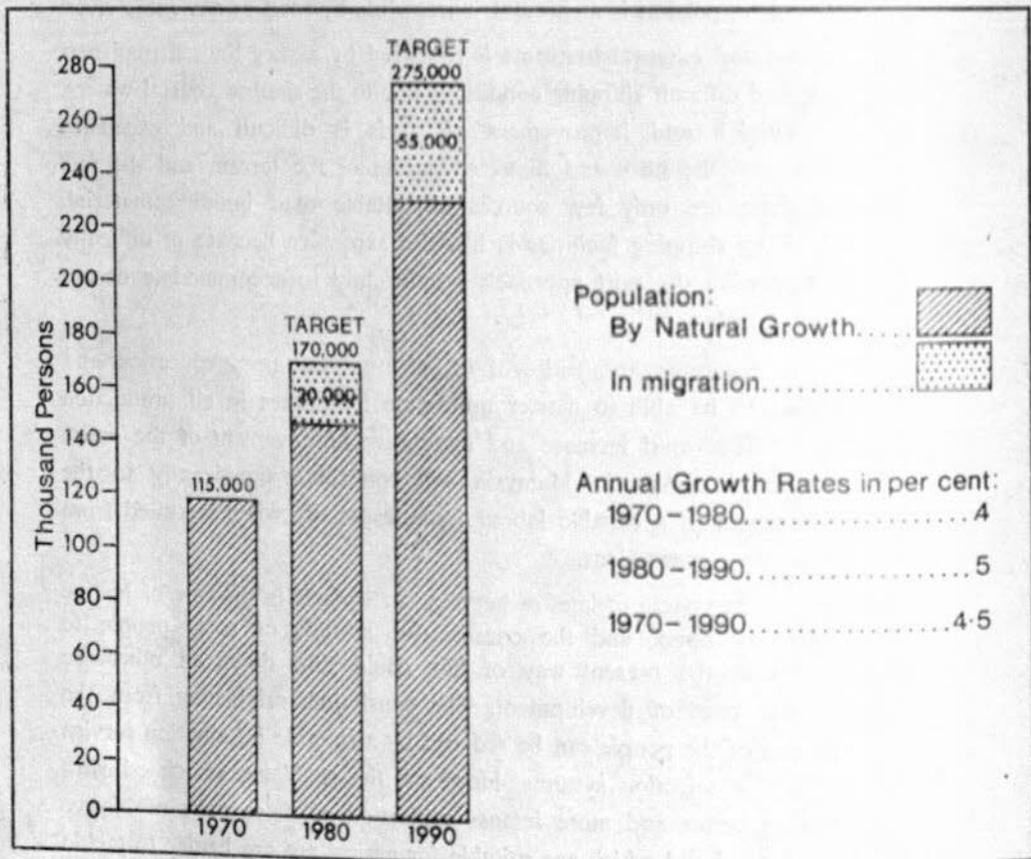
- (a) **Land and climate:** a hilly topography and heavy and frequent rainfall expose the Area to great erosion hazards which, together with the absence of a definite dry period, put strict limitations on the types of crops and methods of cultivation applicable. These factors necessitate careful soil surveying and land use planning. The State land suitable for agriculture is widely scattered and located mainly in the western half of the Study Area, at a considerable distance from both Miri and

Bintulu. Generally it is in relatively small blocks (maximum about 20,000 acres) separated by larger areas of unsuitable land. By far the greatest proportion is at present inaccessible by road or navigable river.

- (b) **Internal and external transport** is restricted by a very limited road network and difficult shipping conditions due to the shallow coastal waters. Construction and improvement of roads is difficult and expensive because of the hilly and dissected nature of the terrain and the fact that there are only few sources of suitable road building material. Improving shipping facilities is likewise expensive because of difficulty of deepening the port approaches sufficiently to accommodate ocean-going vessels.
- (c) **Human resources** are, and will be, plentiful but need education and training to be able to master up-to-date techniques in all production sectors. The rapid increase and qualitative improvement of the entire educational system in Malaysia will contribute significantly to the development of a capable labour force, especially when recruited from the younger generations.
- (d) The present system of land ownership, particularly in the case of Native Customary Land, and the conservative attitude of some people to changes in the present way of life, could slow down an otherwise desirable pace of development. The constraints originating from the attitudes of the people can be reduced by a suitable information service and settler selection systems. However, the problems associated with inducing better and more intense utilisation of those parts of Native Customary Land which are suitable for agriculture are harder to tackle and will take time to overcome. The Sarawak Government has recently established a special working group with the task of considering and working out measures suitable for consolidation and rehabilitation of such land.
- (e) Finance, as an organisational instrument of development, does not appear to impose any immediate constraints although for a period, 1975 to 1984, there will be need for considerable capital import (borrowing) to the Study Area. Possible adverse constraints could be that the overall level of development in Malaysia as a whole will employ the total current amounts of internal resources, or, more likely, create bottle-necks in the supply of special factors of production. Such a situation could affect adversely the balance of payment. This question, however, can only be finally answered when the development plans for the whole of Sarawak and Malaysia are worked out for the pertinent periods.

The Development Plan for the Study Area has been designed with due observance of these constraints. But because the effect of most of these can only be estimated, and then with considerable uncertainty, the Plan contains a built-in flexibility which will allow adjustments to be made.

TARGET POPULATION IN THE STUDY AREA



2.1.5 Targets

The basic targets set forth are:

For Population:

accommodating 160,000 more people between 1970 and 1990 as is shown in Figure 2.3. Nearly half of this number will be a net absorption from the rest of Sarawak, corresponding to 12 per cent of the natural growth in the rest of Sarawak in that period.

For the Economy:

that the Gross Regional Product (GRP) will grow and be distributed as shown in Figure 1.2 of Chapter 1.

For Agriculture: Unencumbered State Land.

about 225,000 net acres of unencumbered State Land be developed to modern agriculture, divided as follows:

- about 172,000 gross acres (or roughly 155,000 net acres) developed by Sarawak Land Development Board (SLDB). Part of the area would be managed as public estates by SLDB and part as smallholdings run by individual smallholders guided and supported by an Agricultural Development Unit (ADU) comprising extension, credit, supply and marketing services.

- about 59,000 net acres for private farms of various sizes, developed and run by private individuals or companies with sufficient capital and credit worthiness to finance the development themselves.
- about 5,000 net acres developed to pasture for a beef cattle breeding ranch operated by the National Livestock Corporation.
- about 1,200 net acres developed to pasture by the Department of Agriculture for the establishment of a Livestock Production and Animal Husbandry Training Centre.
- about 3,000 net acres developed by the Government as a farm for an agricultural university.

For Agriculture: Native Customary Land and Titled Land (for convenience termed occupied land)

road-based-improvement of agriculture be carried out in areas with suitable location and quality: estimated at 36,600 net acres.

Target gross acreages for development are shown in Figure 2.4. Estimated net acreage of crops and pasture land resulting from the development are summarised in Table 2.1.

For Agriculture: All Other Lands

the present effort by the existing extension service of the Department of Agriculture to improve subsistence farming, develop selected cash crops and prevent deterioration of the land be continued.

For Agriculture in general:

- all developments to be based on prior, semi-detailed soil surveys followed by land use planning leading to a diversified farming system compatible with the natural conditions of the Area, and with management requirements.
- all development to be supported by agricultural research aimed at specific problems associated with development in the Study Area.
- establishment, wherever possible, of centralised processing facilities and improvement of marketing organisations.

For Forestry:

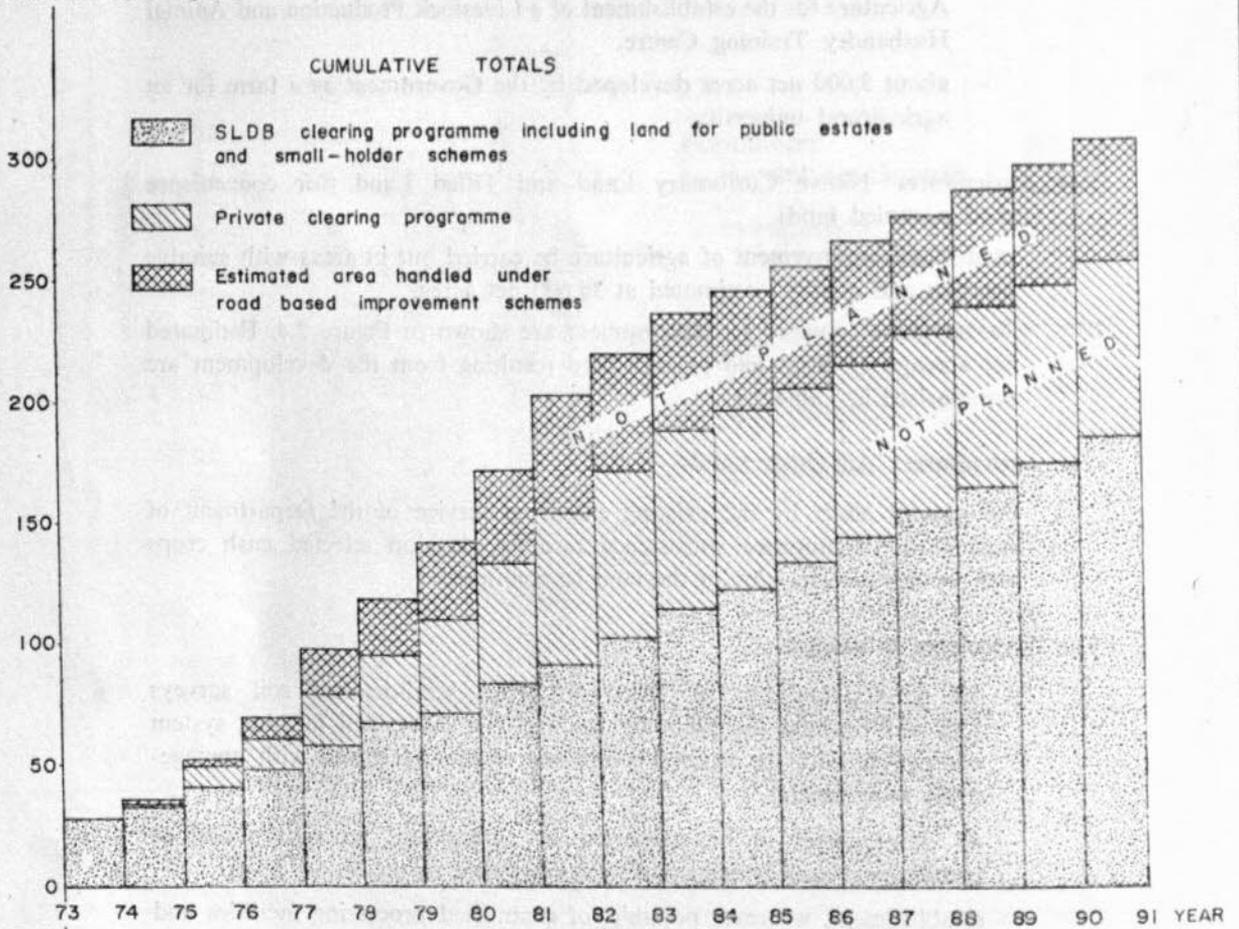
- Harvesting of Mixed Dipterocarp Forests by four timber industry complexes established in cooperation with STIDC.
- Continued harvesting of Swamp Forests according to existing concessions, estimated to be about 5,000 acres per year.
- Increased local processing and further manufactural utilisation of all timber resources. The proposed timber complexes based on the FAO forest units are expected to have a combined throughput of about 19 million cubic feet per year by 1980 and an ultimate capacity of about 29 million cubic feet per year.
- Maximum utilisation of timber originating from forest areas allocated for development to agriculture.

APPROXIMATE RATES OF DEVELOPMENT BY DIFFERENT IMPLEMENTING AGENCIES

Thousand acres (gross)

CUMULATIVE TOTALS

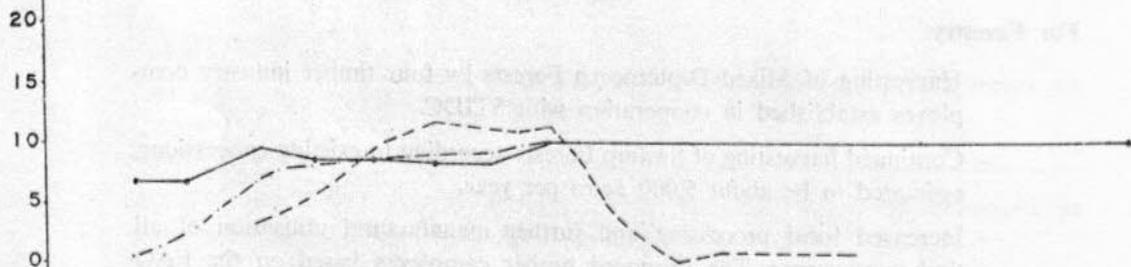
-  SLDB clearing programme including land for public estates and small-holder schemes
-  Private clearing programme
-  Estimated area handled under road based improvement schemes



ANNUAL CLEARED TOTALS

Thousand acres (gross)

-  SLDB
-  Private Developers
-  Road based schemes



Maximum utilisation of forest from future agricultural areas in the FAO units is planned as part of the operations of three of the large timber complexes: those in FAO Units 1, 2 and 3. Also a salvage logging programme, summarised below, has been drawn up for forest areas, outside the FAO Units, destined for allocation to agriculture.

Estimated Acreages of Existing Forest Licence Areas
Scheduled for Release to Agriculture

1974	10,000
1975	14,000
1976	33,000
1977	23,000
1978	23,000
1979	8,000
1980	5,000

For Industries and Services:

- establishment of facilities for processing of local agricultural products such as palm oil, rubber and cocoa.
- expansion of existing towns and establishment of new ones with areas, suitably located and supplied, allocated for development of industries and services.
- provision of financial, technical and organisational support to private enterprise by the Sarawak Economic Development Corporation (SEDC) and STIDC. SEDC should in particular give all kinds of aid to creating small-scale industries and services so that those ethnic groups which so far have had only little access to these occupations can participate at an increasing rate.
- the establishment of a glass container factory, an iron foundry and to handle timber a factory making prefabricated houses, a moulding plant, drying kilns and an impregnation plant.

For Infrastructure:

- completion of the surfacing and partial reconstruction of the Miri-Bintulu Trunk Road, 130 miles.
- expansion of the road network by 312 miles so that it can serve the planned development of agriculture and forestry.
- expansion of Miri airport and later building a new airport for Bintulu.
- completion of the feasibility study of establishing a deep water port near Bintulu and improvement of the minor ports at Miri, Kuala Baram and Marudi.

For Public Utilities:

Successive provision of piped water, electricity and telecommunication to all expanded and new towns and villages.

For Public Services:

Establishment of services such as educational, health, postal and police in a hierarchy suitable to the settlement pattern.

2.1.6 Strategies

The recommended strategies for development are given below. They have been adopted in the Regional Plan and result in a regional structure which is illustrated in the Regional Plan Map at the rear of the Report.

The strategies are:—

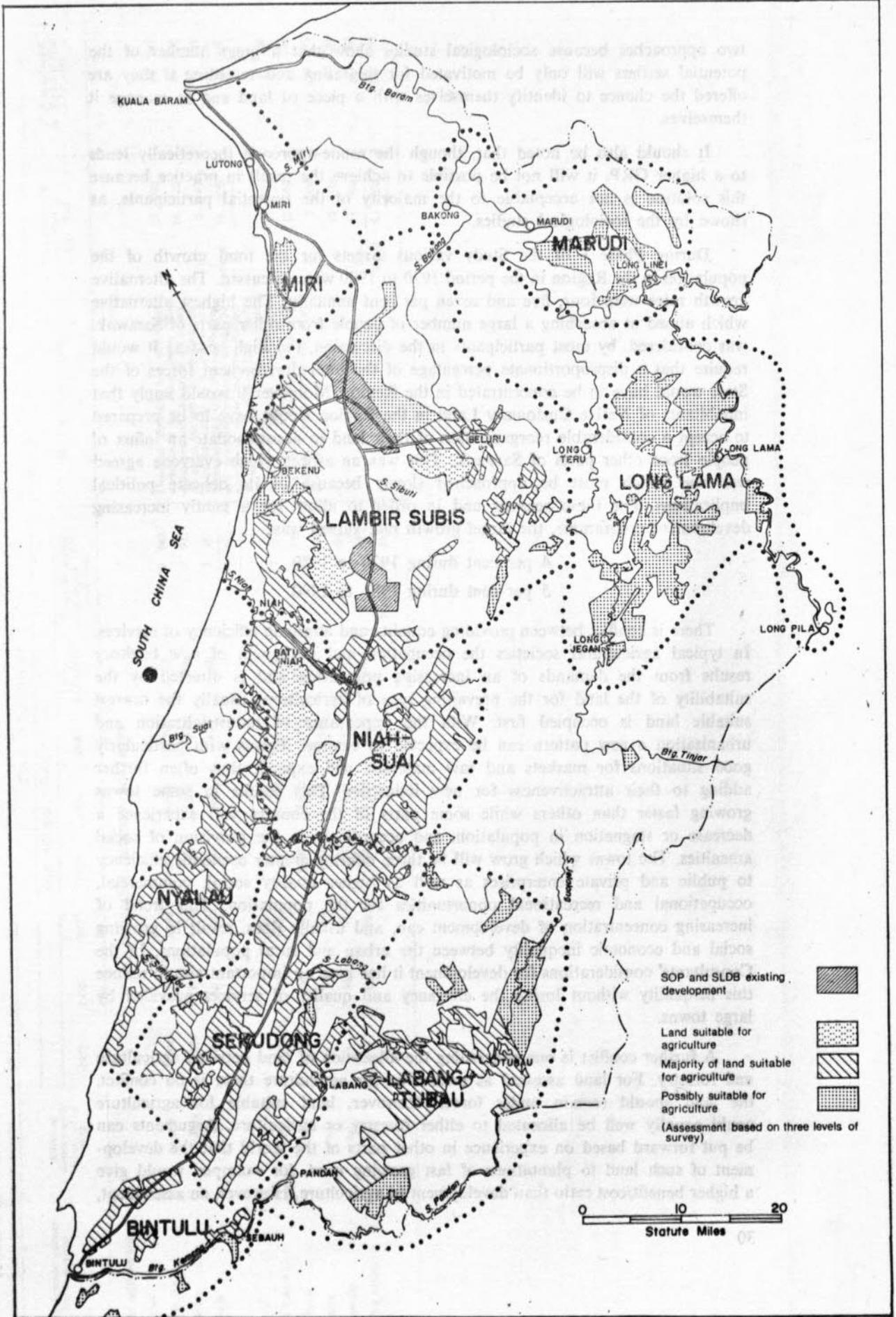
- to divide the Study Area, for development purposes, into 9 Rural Development Areas (RDA) as shown in Figure 2.5;
- to utilise already existing infrastructure and investments to their optimum capacity;
- to give priority utilisation of natural resources to those for which there is already relatively good or easily created access;
- to extend transport lines progressively so as to give access, for further development, to the presently more remote areas which have natural and/or human resources;
- to balance the requirements for economic efficiency with those for social equality;
- to provide appropriate opportunities for both public and private sectors;
- to balance the requirements for economic efficiency, which is provided best by larger urban areas, with the need to provide the rural population with widespread social amenities and services; i.e. to reduce as far as possible the inequality between the urban and rural populations without losing the efficiency and quality of services provided by the large towns. An essential feature of the approach to this structure has been the principle of urbanisation of rural areas described in Volume II, Chapter 6.
- to expand considerably the urban occupations (commerce, industries, services) to provide the Study Area with a population absorption capacity sufficiently large to help alleviate the social problems in other parts of the State. The potential for agricultural and forestry development cannot alone provide the needed employment capacity.

2.1.7 Conflicts

In planning a comprehensive and long-term development as described in the present Report conflicts of aims are often encountered both within the ultimate goals and within the more immediate objectives. For instance, the intended high growth rate of the GRP could conflict with the aim of encouraging the participation of all racial groups in all kinds of activities, because a strategy pursuing the latter aim, which is recommended in the Plan, possibly increases for some time development costs and reduces economic returns but increases social benefits.

A specific instance of this conflict occurs in the choice between development of agriculture by rationally managed, highly disciplined public estates or by individual smallholdings based on the practical training and increasing experience of the individual farmers. The Consultants have recommended a mixture of the

RURAL DEVELOPMENT AREAS



two approaches because sociological studies show that a great number of the potential settlers will only be motivated for migrating and resettling if they are offered the chance to identify themselves with a piece of land and to manage it themselves.

It should also be noted that, though the estate-approach theoretically leads to a higher GRP, it will not be possible to achieve the result in practice because this solution is not acceptable to the majority of the potential participants, as shown by the sociological studies.

During Phase I of the Study various targets for the total growth of the population in the Region in the period 1970 to 1990 were discussed. The alternative growth rates were four, five and seven per cent annually. The highest alternative which aimed at absorbing a large number of people from other parts of Sarawak, was considered, by most participants in the discussion, too high because it would require that a disproportionate percentage of the total development forces of the State would have to be concentrated in the Region. Moreover it would imply that inhabitants of Native Customary Land in the Region would have to be prepared to accept a considerable reorganisation of their land to accommodate an influx of people from other parts of Sarawak. This was an aspect which everyone agreed was one which must be approached slowly because of its delicate political implications. For these reasons and in order to allow for a gently increasing development programme, the target growth rate agreed was:

4 per cent during 1970 to 1980

5 per cent during 1981 to 1990

There is conflict between providing equality and attaining efficiency of services. In typical agricultural societies the occupation and settlement of new territory results from the demands of an increasing population and is directed by the suitability of the land for the prevailing type of agriculture; usually the nearest suitable land is occupied first. With the appearance of industrialisation and urbanisation a new pattern can be expected to emerge. Towns with particularly good situations for markets and raw materials will expand, thus often further adding to their attractiveness for new industries. This results in some towns growing faster than others while some parts of the country will experience a decrease or stagnation in population, and accordingly in the provision of social amenities. The towns which grow will be those offering greater economic efficiency to public and private enterprises as well as higher quality social, commercial, occupational and recreational opportunities for the population. This trend of increasing concentration of development can, and usually does, result in growing social and economic inequality between the urban and rural populations. In the Consultants' considerations for development it has been an important aim to reduce this inequality without losing the efficiency and quality of services provided by large towns.

A further conflict is one concerning the allocation of land between agriculture and forestry. For land assessed as unsuitable for agriculture there is no conflict, the land should remain under forest. However, land suitable for agriculture could equally well be allocated to either forestry or agriculture. Arguments can be put forward based on experience in other parts of the world that the development of such land to plantations of fast growing trees, for example, would give a higher benefit/cost ratio than development to agriculture. However, an assessment,

TABLE 2.1 EXISTING AND RECOMMENDED FUTURE TARGET DEVELOPMENT OF DIVERSIFIED AGRICULTURE (Net Acres)

THE REGIONAL PLAN										
Development agency and enterprise	THE ACTION PROGRAMME							Total for action programme 1975- mid 1981	Estimated total mid 1981 to mid 1991	Estimated total for Regional Plan 1975-1991
	Existing development up to end of 1974	1975	1976	1977	1978	1979	1980				Up to mid 1981
(A) ESTIMATED AGENCY ACREAGES										
PUBLIC AGENCIES										
1) SLDB										
Oil Palms ...	27,600	1,890	3,245	3,945	5,175	4,035	5,980	1,795	62 200	88 265
Rubber ...	3,000(1)	875	370	1,415	645	2,530	770	1,370	16 130	24 105
Cocoa ...	500	120	nil	875	780	nil	450	160	5 940	8 325
									84 270	120 695
2) ADU										
Oil Palms ...	nil	900(2)	850	1,200	1,280	1,250	1,060	1,720	18 000	25 360
Rubber ...	nil	nil	990	3,110	3,900	3,995	3,415	3,715	32 600	51 725
Cocoa ...	nil	nil	190	470	550	615	515	605	7 600	10 545
Rice (3) ...	nil	nil	345	835	850	845	475	710	10 200	14 260
Other crops(3) ...	nil	nil	425	1,095	1,180	1,275	825	1,095	14 700	20 595
									83 100	122 485
Detailed planning has not been undertaken for these years. The estimated total acreages are based on plans for 100,000 gross acres to be developed by SLDB. It has been assumed that the settlement and cropping patterns would be similar to those for the Action Programme Period. ADU totals are estimates of what acreages could be handled if expansion continued at the same rate as in the Action Programme period. But the acreages have not been planned.										
PRIVATE INVESTORS										
Oil Palms ...	10,000(4)	nil	nil	1,360	3,150	5,350	4,250	2,460	4 770	21 340
Rubber ...	20,000(5)	nil	nil	390	900	1,530	3,280	3,315	6 570	15 985
Cocoa ...	nil	nil	nil	120	290	500	1,280	1,345	2 670	6 205
Rice and other crops ...	Not Known	nil	nil	70	160	270	210	120	250	1 080
Beef ...	nil	nil	nil	nil	nil	500	1,000	1,225	5 900	8 625
									20 160	53 235
By 1981 not all land allocated to private investors during the Action Programme would have been developed. The remaining allocated land plus a further 5 900 gross acres are planned to be developed in this period. The cropping pattern is assumed to be similar to the previous one.										
NATIONAL LIVESTOCK CORPORATION										
Pasture for Beef ...	750	2,250	2,000	nil	nil	nil	nil	nil	NIL	5 000
DEPARTMENT OF AGRICULTURE										
Beef investigations ...	nil	250	250	450	250	nil	nil	nil	187 530	302 615
									Grand Total	1 200
									Grand Total	302 615
(B) ESTIMATED ENTERPRISE ACREAGES										
Oil Palms ...	37,600	1,890	4,095	6,505	9,605	10,635	11,290	5,975	84 970	134 965
Rubber ...	23,000	875	1,360	4,915	5,445	8,055	7,465	8,400	55 300	91 815
Cocoa ...	500	120	190	1,465	1,620	1,115	2,245	2,110	16 210	25 075
Rice and other crops ...	Not Known	N. K.	770	2,000	2,190	2,390	1,510	1,925	25 150	35 935
Beef ...	750	2,500	2,250	450	250	500	1,000	1,225	5 900	14 825
									Grand Total	302 615

Notes: (1) The Lambir Small-holders Planting Scheme.
 (2) Estimated acreage that will have been planted as road based improvement under supervision of the Department of Agriculture's existing extension service. These acreages are not included in the Action Programme.
 (3) Acreages include road based improvement scheme as well as rice plots and homestead plot on SLDB small-holder sub-schemes.
 (4) Plantings already completed by Sarawak Oil Palms a joint venture undertaken by the Sarawak Government and the Commonwealth Development Corporation.
 (5) Only large contiguous plantings are included. The numerous scattered plots throughout the Study Area are excluded.



1:25000
1:50000
1:100000
1:200000
1:500000
1:1000000

Year	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
Area (km²)	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Population	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
Urban Area	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Rural Area	90	130	170	210	250	290	330	370	410	440	490	530	570	610	650
Water Bodies	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Forest Area	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Barren Land	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Other	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75

FIGURE 1. EXPANDING AND RECONSTRUCTED RUMBLE KINCELA DEPARTMENT OF DISTRICTED FORESTLAND (2001 YEAR)

given in Supporting Report 3, and based on present knowledge and experimental evidence in Sarawak does not support the superiority of forestry. Also because of the general scarcity of land suitable for agriculture in the Study Area and because of the need to maximise job creation it has been recommended that such land should generally be allocated to agriculture.

Wherever these and other actual or potential conflicts have been present the Consultants have pointed them out and have included the recommended solutions in the Plan. A fundamental conflict, arising from the overall distribution of development resources between the various regions of the Nation can only be solved by the Government on the basis of comparing the present Plan with other plans, projections and wishes. The economic section of this Report offers a concise and comprehensive contribution to this decision making.

2.2 POPULATION

2.2.1 General

This section presents the basic, quantitative features of the present and future population with respect to demographic, occupational and geographic aspects. The qualitative aspects are presented in Volume II, Chapter 2 and further details in Supporting Report 5. The Plan is based on several assumptions and definitions:

- **natural growth** of the population has been taken as 2.8 per cent per year which agrees with Government expectation;
- **net in-migration**, together with natural growth, gives a combined growth corresponding to annual rates of four per cent during the period 1970 to 1980 and five per cent during 1981 to 1990;
- **the labour force** is that part of the population that wishes and is able to work gainfully;
- **employment** represents the number of people actually working gainfully; the difference between this and the labour force being unemployment and underemployment;
- **occupational structure** is the number of people employed in each of the main production sectors (agriculture, forestry, manufacturing, services).

Due to the Government's current education policies it is reasonable to expect that there will be progressive improvement in the general level of education, and participation by all ethnic groups in the various activities. Also that there will be an increased share of total employment in manufacturing and services and a relative decrease in agriculture and forestry.

2.2.2 Present and Future Populations

The changes in the future population up to 1990 envisaged in the Plan are summarised in Tables 2.2 and 2.3.

The figures are not forecasts, which would indicate a kind of a natural development, but targets which have been based partly on an evaluation of development potentials in the Region and partly on what has been considered necessary to accommodate an increasing population with an expectation of improved living standards. Whether the target figures will also be the real figures will, to a large extent, depend on the active efforts of the population and the Government. The Plan shows the consequences of attempting to achieve the growth rates previously mentioned.

TABLE 2.2 POPULATION—LABOUR FORCE—EMPLOYMENT

	1970 No. of persons	% of total pop.	1980 No. of persons	% of total pop.	1990 No. of persons	% of total pop.
Total population	115,000	100	170,000	100	275,000	100
Age group 15-64	60,000	52	88,000	52	143,000	52
Labour force	45,000	39	66,000	39	107,000	39
Employed	39,000	34	60,000	35	100,000	36
Un- and underemployed	6,000	5	6,000	4	7,000	3

TABLE 2.3 OCCUPATIONAL STRUCTURE

Sector	1970		1980		Growth rate	1990		Growth rate
	No. employed	% of total	No. employed	% of total		No. employed	% of total	
Agriculture	21,000	54	32,000	53	4.4	50,000	50	4.6
Forestry	4,000	10	5,500	9	3.2	6,000	6	0.9
Manufacturing	4,500	12	8,500	14	6.5	21,000	21	9.5
Services	9,500	24	14,000	23	4.0	23,000	23	5.0
Total employed	39,000	100	60,000	100	4.4	100,000	100	5.2
Unemployed and under- employed	6,000	—	6,000	—	—	7,000	—	—
Total labour force	45,000	—	66,000	—	4.0	107,000	—	5.0

Comments on the Tables:

- (a) The **total population** figures are based on the assumed growth rates. The net in-migration to the Study Area will amount to approximately 20,000 in 1970 to 1980 and 55,000 in 1980 to 1990. The total in-migration of 75,000 corresponds to 12 per cent of the population growth in Sarawak outside the Study Area, which represents the contribution of the Study Area to easing the population pressure in other parts of Sarawak.
- (b) The **age group 15-64** is the basis for calculating the labour force. This age group, based on statistical evidence, represents 52 per cent of the total population. The **labour force** is taken as 75 per cent of the age group.
- (c) The **employed** are estimated at 87 per cent of the labour force in 1970, 91 per cent in 1980, and at 93 per cent in 1990.
- (d) Table 2.3 shows that the labour force and total number of employed increase at rates corresponding to the growth rate of the total population. In the first 10 year period the employment in agriculture and manufacturing grows at a pace above the average. In the second 10 year period employment in manufacturing and services increases at the fastest rate, with the result that the urban occupations (manufacturing and services) account in 1990 for 44 per cent of the total employment, against 36 per cent in 1970.

This occupation structure is partly a result of opportunities provided by the natural and human resources of the Area and partly of a deliberate policy to attract and develop industries which do not have an immediate justification under existing conditions.

As a result of the development proposed in the Plan the percentage of the total population that will be living in urban areas is expected to rise to about 50 per cent by 1990 compared to between 35 and 40 per cent in 1970.

The concepts of labour force, employment and unemployment do not have the same distinctive meaning in the Sarawak economy as they have in a highly industrialised society. Under-employment includes people not working full-time or at full efficiency. In Sarawak, however, many of these people would be occupied in useful activities which are difficult to register statistically, such as part-time fishing, hunting, house-building, making of household utensils, etc.

The target figures in the Tables show a certain unemployment, indicating that some of the population may not be willing to work full-time and that full employment may not be obtainable within the 20 year period.

2.2.3 Geographical Distribution of Population and Occupation

The geographical distribution of the present and future populations are shown by RDAs in Figure 2.6. Although uncertainty must be associated with such a geographical breakdown of the total regional figures, especially in the long-term, the target figures shown are based mainly on the proposed phasing of development and the predicted number of jobs created by agriculture and forestry within certain RDAs, as shown in Table 2.4.

During the period 1979 to 1980 the growth of employment in each RDA is based on the implementation of the Action Programme. For the period 1981 to 1990 location of new employment outside the towns of Miri and Bintulu is based on the development envisaged in the overall Regional Plan. The population distributions are consistent with the objective to develop Bintulu to an important growth pole in Sarawak, and take into account that Miri, because of its present status as the most important manufacturing and service centre in the Area, will grow by its own momentum.

Explanatory Comments to Table 2.4.

Agriculture

The main growth of employment from 1970 to 1980 will be in Lambir-Subis and Niah-Suai RDAs with a total of 85 per cent of new employment, and from 1981 to 1990 in Sekudong, Niah-Suai, Labang-Tubau and Lambir-Subis with nearly 90 per cent of the net creation. Although development will be started in Nyalau before 1990, the bulk of the new employment will come after that year.

Forestry

Employment here covers both sawmills and logging activities including transport of logs. The modest growth in employment is because the timber boom at the time of the 1970 Population Census had attracted a considerable number of workers to the Region and because improved technical equipment in the forestry industry in the future will substitute part of the demand for labour.

POPULATION GROWTH BY RURAL DEVELOPMENT AREAS

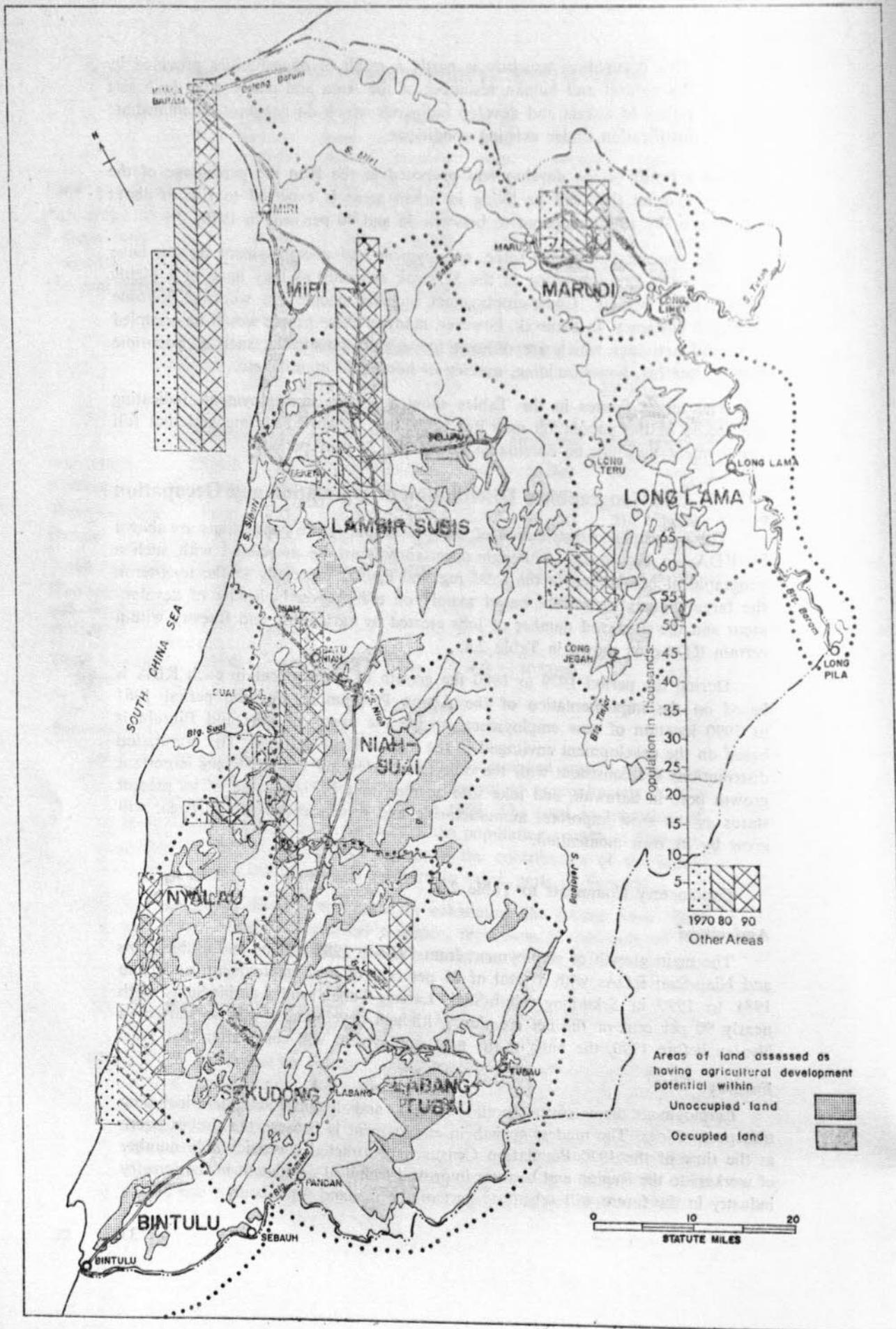


TABLE 2.4 EMPLOYMENT CREATION BY SECTOR AND RDA 1970-1980 AND 1981-1990.
NUMBERS OF EMPLOYED

SECTOR	Agriculture						Forestry		Manufacturing		Services		Total	
	1970-80		1981-90		1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90
	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90	1970-80	1981-90
Miri ...	650	500	110		1,555	4,000	1,900	3,000	4,215	7,500				
Marudi ...	50	100			115	100	155	100	320	300				
Lambir-Subis ...	5,650	2,400			50	550	565	450	6,265	3,400				
Long Lama ...	100	750	110		190	600	200	500	600	1,850				
Niah-Suai ...	3,700	4,050	425	125	110	550	540	900	4,775	5,625				
Sekudong ...	550	6,920	425	125	100	550	25	750	1,100	8,345				
Labang Tubau ...	50	2,530			40	100	115	250	205	2,880				
Nyalau ...		500			40	50		50	40	600				
Bintulu ...	250	250	330	250	1,800	6,000	1,000	3,000	3,480	9,500				
Study Area ...	1,100	1,800	1,500	500	4,000	12,500	4,500	9,000	21,000	40,000				

Manufacturing

About 35 per cent of the new jobs during the first six year period will be in construction of roads, urban infrastructure, housing and in the clearing of land for agriculture. The distribution of these jobs in various RDAs would be in accordance with the phased development. About 20 per cent of new employment by 1980 would be located mainly in Miri and Bintulu. It would be associated mostly with numerous small and medium-sized industries created as a result of the growth of other industries and of the population in these two towns. It is anticipated that only a minor portion of such industries would be established in Marudi, Long Lama and in the new Regional and Sub-Regional Centres (Igang and Ladang Tiga) during the Action Programme Period. Most large-scale industries are planned to be located in either Miri or Bintulu during this period, but exceptions are:

A timber complex and a palm oil mill in Igang.

A timber complex in Long Lama.

A palm oil mill in Ladang Tiga.

After 1980 it is believed that the main towns in the new agricultural areas and Long Lama could attract some small-scale and medium-sized industries. Nevertheless, 80 per cent of new employment in industry is scheduled for Bintulu and Miri.

Services

The new jobs created during the period 1975 to 1980 are expected to be divided equally between private services and public services and utilities. About 60 per cent of the employment growth in private services from 1970 to 1980 will result from employment associated with the growth of Miri and Bintulu, and 30 per cent associated with new agricultural development in other RDAs.

Up to 1980 nearly 70 per cent of the new jobs in the public services and utilities will be in Miri and Bintulu, about 25 per cent in the new towns and villages and five per cent in the existing small bazaars. After 1980 the build-up of services is expected to follow the pattern of planned development. The sub-regional service centres in the Niah-Suai and Sekudong RDAs, will attract more and higher level services thereby creating relatively more jobs than the smaller villages in the Lambir-Subis RDA. The expected build-up in Long Lama is associated with its likelihood of becoming a sub-regional centre.

The employment figures shown for Miri and Bintulu RDAs during 1981 to 1990 are derived partly from the envisaged growth of Miri and Bintulu towns, and partly from targets which must be achieved if the Study Area is to absorb a substantial number of persons from other parts of Sarawak and to obtain a growing GRP.

The estimated future employment in each RDA forms the basis for the population forecasts shown in Table 2.5.

In Labang-Tubau RDA a net out-migration is expected up to 1980 thereafter a net in-migration will commence. Development in the Nyalau RDA starts too late in the Plan period for its effect to have fully counteracted by 1990 the out-migration expected during the early years.

Most RDAs are expected to have net in-migration. The Lambir-Subis and Niah-Suai RDAs will have the greatest increase during the period 1975 to 1980; Sekudong, Niah-Suai and Bintulu RDAs during 1981 to 1990. Marudi and Other Areas are expected to be out-migration areas during the whole period to 1990.

TABLE 2.5 POPULATION GROWTH AND NET MIGRATION BY RDA 1970-80 AND 1981-90

RDA	Population		Population by natural growth		Total growth		Net migration In (+) Out (-)	
	1970	1980	1980	1990	1970-80	1981-90	1970-80	1981-90
Miri ...	35,000	46,000	46,000	60,000	11,085	18,750	+ 85	+ 4,750
Marudi ...	11,500	15,000	15,000	20,000	840	780	- 2,660	- 4,220
Lambir-Subis ...	19,000	25,000	25,000	33,000	17,030	9,190	+ 11,030	+ 1,190
Long Lama ...	8,000	10,500	10,500	17,000	1,585	4,850	- 915	+ 1,350
Niah-Suai ...	4,500	6,000	6,000	8,000	12,460	15,290	+ 10,960	+ 13,290
Sekudong ...	5,000	7,000	7,000	9,000	2,600	22,835	+ 660	+ 20,835
Labang-Tubau ...	8,500	11,000	11,000	15,000	540	7,950	- 1,960	+ 3,950
Nyalau ...	3,500	5,000	5,000	6,000	100	1,655	- 1,400	+ 655
Bintulu ...	12,500	16,000	16,000	21,000	8,760	23,700	+ 4,760	+ 18,700
Other Areas ...	8,000	10,500	10,500	11,000			- 2,500	+ 3,500
Study Area ...	115,000	152,000	152,000	200,000	55,000	105,000	+ 27,435	+ 64,720
							- 9,435	- 7,720

2.3 THE PHYSICAL STRUCTURE PLAN

The physical structure of the Region is the geographical distribution of the population, the farming areas, forest areas, towns, industries, transport lines and terminals. Parts of this structure can be modified and developed in such a way as to make a big contribution towards achievement of development goals.

The geographical distribution of the population has already been described in Section 2.2. The planned distribution of the other physical structure components over the Study Area by 1990 is shown in two maps, the Regional Plan Map in the rear of this Report and in greater detail on Map Number 22 in the Map Folder. The division, for development purposes, of the Study Area into nine Rural Development Areas (RDAs) has already been illustrated in Figure 2.5. An RDA is a composite geographical area, the size and location of which is determined by physical, organisational, management and processing factors. Each RDA contains land that can be largely developed independently, often as a development package based on agriculture and forestry; but development in one RDA would generally be mutually supporting with previous or subsequent development within it or in an adjacent RDA. The basic aims of the physical plan have been:

- (a) to open up presently unoccupied land for settlement by people mostly from other parts of Sarawak;
- (b) to create a balanced development over the Study Area as a whole to the benefits of immigrants and local inhabitants;
- (c) to undertake simultaneously the following:
 - to increase urbanisation which, in addition to creating new sub-regional centres, service centres and villages, would include developing two major growth poles—Miri and Bintulu;
 - to control the rate of migration to towns by creating urban amenities in the new rural development areas.

However, there are environmental, historical, economic and social conditions in the Study Area which have dictated to a large extent the location and phasing of the physical structure of the Plan. These aspects are briefly discussed below.

The basic topography of the Study Area is such that the majority of the land suitable for agriculture lies in its western half. In general the more eastern parts are mountainous and unsuitable for agriculture; consequently they are mostly excluded from the main future development.

The historical river-based settlement of the land has resulted in most of the suitable agricultural land close to the rivers being already occupied and therefore not considered available for large-scale development in the present plans because, as stated in the Scope of Work, the main objective of the development is to open up suitable unencumbered State Land in order to absorb people from other parts of Sarawak. Major new development must therefore be located in land some distance from the larger navigable rivers and its phasing must in consequence depend largely upon the relative accessibility by road of the different areas. Attention for early development is automatically focussed on land close to the recently completed Miri-Bintulu Road and its few existing or already planned feeder roads.

Economic aspects of development require that the fullest possible use is made of the timber from the forest on the unoccupied land before it is cleared for agricultural development. Development must therefore start first on those areas which have already been logged or on which logging is currently taking place. These areas are mostly in the Lambir-Subis, Niah-Suai and Labang-Tubau RDAs. Consequently it is here that most of the development planned for implementation during the next five or six years is located.

For these reasons substantial agricultural development near Bintulu has not been proposed. An element of strategy considered desirable early in the Study has had to be abandoned due to the influence of the conditions described above. Agricultural development around Bintulu remains both possible and desirable, at a later stage.

Agricultural development in the virgin forest areas has been planned to be tackled systematically in the later stages of the development plan. Organised harvesting of the forests has been co-ordinated with the release of land to agriculture. Again the areas most easily accessible, generally those closest to the Miri-Bintulu Road, are scheduled for opening-up first, followed progressively by the areas further away.

The development planned and envisaged in each RDA is briefly discussed below. Further details are given in Volume II, Chapters 2 to 8 in this Report, and each sector is fully described in the Supporting Reports.

2.3.1 Development by Rural Development Areas

In this section the salient features of development are described for each Rural Development Area and are shown in Figure 2.7.

Miri Area

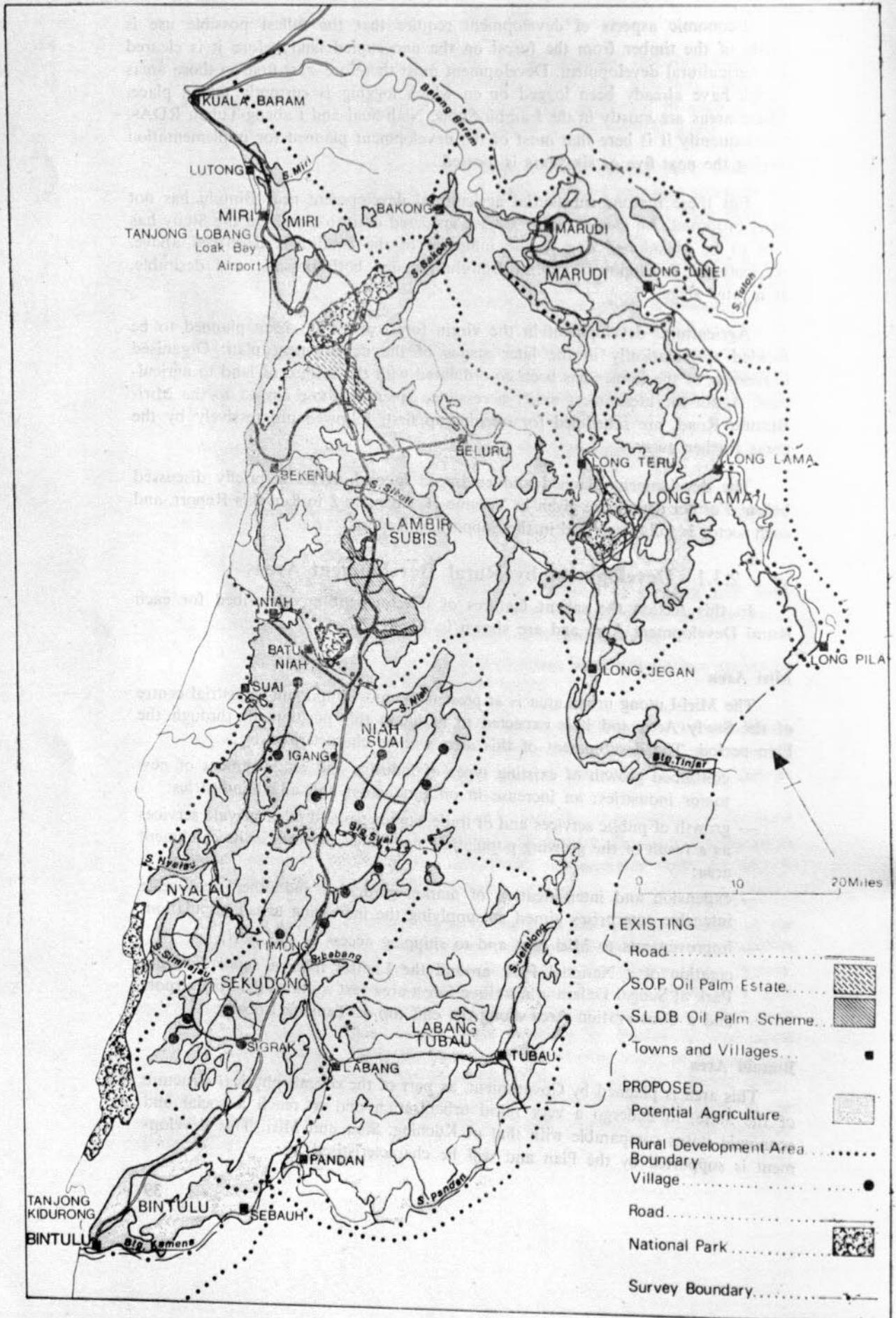
The Miri-Lutong urban area is at present the most important industrial centre of the Study Area and it is expected to maintain this position all through the Plan period. The development of this area will be characterised by:

- continued growth of existing types of industry and establishment of new major industries; an increase in oil production and allied industries;
- growth of public services and of trade, commerce and other private services as a result of the growing population and higher incomes in its catchment area;
- expansion and intensification of market gardening and other small-scale intensive enterprises aimed at supplying the increasing urban population;
- improvements to Miri port and to shipping access to this port;
- creation of a National Park around the Lambir hills, a small National Park at Sungai Dalam in a unique forest area just south of the Miri airport and a Conservation Area along the cliff top at Tanjung Lobang.

Bintulu Area

This area is planned by Government, as part of the overall physical structure of the State, to undergo a very rapid urbanisation and to reach a social and economic status comparable with that of Kuching, Sibul and Miri. This development is supported by the Plan and will be characterised by:

PROPOSED RURAL DEVELOPMENT



- the establishment of a Liquefied Natural Gas plant, a timber complex, a glass factory and an industrial estate for various industries in a proposed new town area close to Tanjung Kidurong;
- the construction of a deep-water port or other major cargo handling facilities near Bintulu before 1980;
- the construction of about 20 miles of major roads connecting the port and industrial areas with the present Bintulu town and with the Miri-Bintulu Road;
- major expansions in the public services;
- a substantial increase in private services;
- establishment of a new university;
- utilisation of forestry and agricultural potential in the surrounding areas; close to Bintulu the agricultural development would include a university research farm, and the formation of an Agricultural Development Unit Centre (ADU Centre) to undertake road based improvement of agriculture in legally occupied land along the Miri-Bintulu Road. Rubber planting, market gardening and other small-scale intensive enterprises aimed at supplying the increasing urban population and visiting ships would be the main enterprises encouraged;
- the construction of a new Bintulu airport after 1985;
- creation of a National Park of about 37,000 acres on the west coast north of Bintulu in part of the present Similajau Forest Reserve.

Marudi Area

Marudi's importance as the main trading centre for the entire Baram hinterland will be reduced when, as is already planned by Government, Long Lama is connected by road to the Miri-Bintulu Road. The Marudi area has little usable unoccupied agricultural land and in order to maintain an optimum level of economic activity in the Area it is recommended to base its future on:

- the formation in 1976 of an ADU Centre to undertake road based improvement of agriculture along the new road presently being constructed to Long Linei. Rubber planting would be the main enterprise encouraged. The road will later (1986) be extended to Long Lama giving the opportunity for a corresponding expansion of ADU activity;
- maintaining, and later increasing, its importance as a rubber processing and market centre for the Baram river system;
- the possible connection of Marudi to Miri by a 38 mile road via Bakong village. If such a road connection is found feasible, after a special study recommended by the Consultants, it could improve Marudi's position as a trade centre for parts of the Baram hinterland.

Lambir-Subis Area

This area is already rather densely populated and quite well supplied with roads. Within this area the first large-scale planned agricultural development in the Fourth Division has been undertaken and the landscape has already changed considerably with large oil palm plantations established or growing up. Future planned development includes:

- the completion by 1976 of the present SLDB and Sarawak Oil Palm (SOP) plans to plant a total of about 40,000 acres of oil palms, establish two oil palm mills and several villages;
- completion by 1975 of a road from Beluru eastwards to the Tinjar river and beyond to Long Lama;
- starting, in 1975, the establishment of a new village associated with the development of about 3,700 acres of unoccupied State Land for eventual allocation to smallholders;
- starting, in 1974, the establishment of a commercially orientated beef cattle breeding ranch covering about 6,000 gross acres of State Land; and, adjacent to it starting in 1975 a Livestock Production and Animal Husbandry Training Centre established by the Department of Agriculture;
- the release of approximately 25,000 more acres of unoccupied State Land for private development from 1975 to 1977;
- the setting up of ADU headquarters in 1974 and a training centre in 1975;
- the formation of four ADU Centres specifically to guide and support smallholder farmers and undertake road based improvement in legally occupied land.
- in 1981 to 1982 construction of a feeder road from Bekenu to Niah.

Niah-Suai Area

There are at present quite large areas of shifting cultivation and stationary cultivation by both Ibans and Chinese. Also there are considerable areas of unoccupied State Land. Future planned development includes.

- the establishment during the period 1975 to 1983 of a new Sub-Regional Centre (Igang) and eight agricultural villages associated with the opening-up by SLDB of about 62,800 gross acres of agricultural land for a nucleus estate and smallholder farms;
- the establishment of a large oil palm mill in 1979 near Igang;
- starting in 1976, close to Igang, a timber industry complex with an annual throughput of 150,000 tons of logs when in full operation;
- the formation by 1982 of six ADU Centres specifically to work in the intensive development areas to guide and support smallholder farmers and undertake road based improvement of agriculture in legally occupied land;
- from 1974 to 1980 the construction of 40 miles of public feeder roads;
- the release of about 2,200 acres of land for private agricultural enterprise by 1980;
- the effective creation and management of a National Park containing the Niah limestone outcrops and its extensive caves.

Long Lama Area

In this RDA there are large areas under shifting cultivation, much of it suitable for agriculture, which could be more intensively used and thus accommodate an additional population in the future. Large areas of virgin forest also exist. The planned development includes:

- the completion by 1976 of the Beluru-Long Lama trunk road which, it is envisaged, will give Long Lama the status of a Sub-Regional Centre serving the upper part of the Baram hinterland; construction of a road to Long Jegan during 1983 to 1984.
- the formation during 1976 of an ADU Centre to undertake road based improvement in Native Customary Land along the new road;
- the creation of a National Park around Loagan Bunut in association with a scheme to preserve and improve the fishing in the lake;
- the establishment of a timber industry complex in Long Lama based on virgin forest areas in FAO Forest Unit 7 east of the Baram river.

Sekudong Area

Huge areas are presently covered by virgin forest in addition to large areas of occupied land. The planned development includes:

- the establishment between 1985 and 1990, of a Sub-Regional Centre (Timong), a Service Centre (Sigrak) and six agricultural villages in association with the opening-up by SLDB of about 52,000 gross acres of unoccupied State Land for a nucleus estate and smallholder farms;
- the release of about 4,700 acres of State Land for private agricultural development in 1977, and a further 2,700 acres in 1984;
- the establishment in 1976 of a timber industry complex close to the site of the future Sub-Regional Centre, the annual throughput of logs will be 150,000 tons when in full operation;
- the construction of 40 miles of public feeder roads before 1980, and a further 20 miles during 1981/82;
- the construction in 1975 to 1976 of a secondary road connecting Labang to the Miri-Bintulu Road;
- the formation during 1977 of an ADU Centre at Labang to undertake road based improvement in Native Customary Land bordering the new road.

Labang-Tubau Area

This RDA contains much of the Kemena river and its tributaries near which are a number of settlements based on shifting cultivation. In addition there are about 16,000 acres of unoccupied State Land with high proportions suitable for agriculture. There is a good potential for forestry. The planned development includes:

- the extension of the new secondary road, with a trunk road alignment, from Labang to Tubau in 1977/78; extension southwards during 1984;
- starting in 1979, the opening-up of the occupied land (16,000 gross acres) for agriculture by large and medium-scale private investors to create a nucleus for further development. Rubber will probably be the main crop;
- establishment of a Service Centre starting in 1980, in association with the private development;
- formation of an ADU Centre at Tubau to undertake road based improvement of agriculture in Native Customary Land along the new road. Rubber would be the main crop encouraged;

- construction of a feeder road northwards from Tubau for about 15 miles during 1985 to 1986.

Nyalau Area

The majority of the area is at present virgin forest which is included in the FAO plans for utilisation. The area is only sparsely populated. Planned development includes:

- the establishment of a Service Centre and five villages during the late 1980's in association with the opening-up by SLDB of about 30,000 gross acres of agricultural land;
- the building of about 40 miles of public feeder roads by 1985 associated with forest harvesting plans and subsequent agricultural development.

2.3.2 Transport Network

This section gives a summary of the future transport infrastructure (roads, ports and airports). A more detailed description, which includes the present situation, is given in Volume II, Chapter 7 and in Supporting Report 7.

In 1972 the Miri-Bintulu Road was opened for its entire length. Side roads from it have been and are continuing to be built. Thus the transport pattern, which previously had relied solely on rivers, is being changed, creating a new regional structure. However, considerable and accelerated further extension of the existing road network is a pre-requisite for the expansion of development envisaged in the Plan. Roads are an essential catalyst in transforming the subsistence economy into a market-oriented, cash crop economy and for making the urban amenities available to the rural population.

In order to improve the Region's export trade possibilities to world markets and to other parts of Sarawak the Regional Plan includes the construction of a deep-water port or other cargo handling facilities near Bintulu, improvement of Miri port and the wharf at Marudi, as well as extensions of the trunk road network, improvements to Miri airport and eventually the development of a new airport near Bintulu. Each of the components of the transport network are briefly discussed below:

Roads

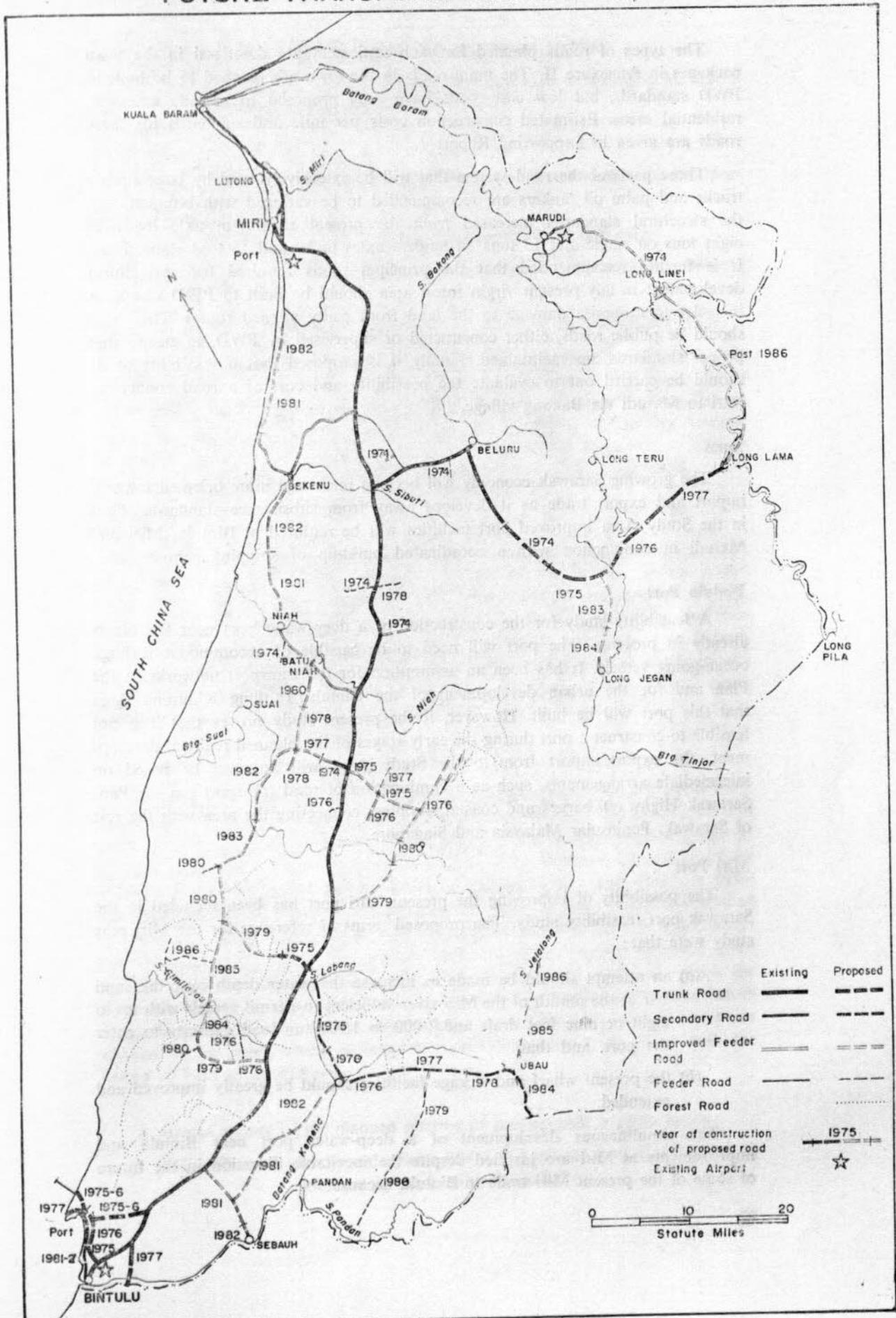
New roads should, whenever possible, be aligned to pass through populated areas and land suitable for agriculture. A strategy further explained in Volume II, Chapter 3 is that intensive agricultural effort in legally occupied land should start by improving farming along roads.

The road network planned to be constructed by 1990 is shown in Figure 2.8, it includes:—

- (a) 48 miles of new trunk roads completed by 1980;
- (b) 76 miles of new urban roads completed by 1980; requirements after 1980 have not been planned;
- (c) 264 miles of other public roads outside the urban areas, of which 124 miles should be completed by 1980;
- (d) improvement and surfacing of 130 miles of trunk roads and secondary roads and improvements to 11 bridges completed by 1980;
- (e) an extensive network of forest roads in the FAO Units 1, 2 and 3.

FUTURE TRANSPORT INFRASTRUCTURE

FIGURE 2-8



The types of roads planned for each settlement are described in the town packages in Annexure II. The main roads in the town are planned to be built to PWD standards, but low cost roads have been proposed to provide access to residential areas. Estimated construction costs per mile and standards for these roads are given in Supporting Report 7.

Those parts of the road system that will be extensively used by large timber trucks and palm oil tankers are recommended to be surfaced with bitumen, and the structural standards increased from the present maximum axle loads of eight tons on single and 13 tons on tandem axles to 10 and 16 tons respectively. It is further recommended that the principal roads required for agricultural development in any present virgin forest area should be built to PWD standards in order to minimise damage to the land from badly aligned routes. The roads should be public roads, either constructed or supervised by PWD, to ensure that proper standards are maintained. Finally it is proposed that a feasibility study should be carried out to evaluate the possibility and cost of a road connecting Miri to Marudi via Bakong village.

Ports

The growing Sarawak economy will become more and more oriented towards import and export trade as it develops away from subsistence standards. Thus in the Study Area improved port facilities will be required at Bintulu, Miri and Marudi in conjunction with a coordinated build-up of shipping arrangements.

Bintulu Port

A feasibility study for the construction of a deep-water port near Bintulu is already in progress. The port will need to be capable of accommodating large ocean-going vessels. It has been an assumption for the transport networks in the Plan and for the urban development of the Bintulu/Tanjung Kidurong Area that this port will be built. However, if the present study proves that it is not feasible to construct a port during the early stages of the planned regional development, the export/import from/to the Study Area will have to be based on intermediate arrangements, such as a combination of road transport (on the Pan-Sarawak Highway), barges and coastal shipping, connecting the area with the rest of Sarawak, Peninsular Malaysia and Singapore.

Miri Port

The possibility of improving the present Miri port has been included in the Sarawak port feasibility study. The proposed terms of reference for the Miri port study were that:

- (a) an attempt should be made to increase the water depth over the sand bar at the mouth of the Miri river sufficient to permit vessels with up to eight or nine feet draft and 1,000 to 1,500 ton load capacity to enter the port, and that
- (b) the present wharf and storage facilities should be greatly improved and extended.

The simultaneous development of a deep-water port near Bintulu and improvements at Miri are justified despite the inevitable diversion in the future of some of the present Miri trade to Bintulu because:

- (a) the present and future commercial importance of Miri;
- (b) the two ports are about 130 miles apart and each would tap a hinterland of great potential productivity.

Marudi Port

A final decision on whether to carry out major improvements to this port should await decisions on:

- (a) the future status and economic importance of Long Lama;
- (b) the possibility of building a road connection from Miri via Bakong village;
- (c) the success of special agricultural developments in the Marudi RDA.

The road already being built from Beluru to Long Lama will, when it is completed, divert trade from the upper reaches of the Baram and Tinjar rivers to Miri and Bintulu, thus considerably reducing the administrative and commercial importance of Marudi. River trade will be further reduced if a road—the Bakong Road—is built connecting Miri to Marudi, but the road might be a help to Marudi in mitigating the adverse effects of reduced river trade and traffic.

Airports

Miri airport is already being extended to accommodate medium-size jet aircraft but a corresponding improvement of the Bintulu airport services is not considered to be necessary until after 1985. By that time the present runway, sited so close to the town, will be unsatisfactory because of the noise and constraint imposed on expansion of the town. A new airport will need to be located further from the urban areas. A possible location is indicated in the Regional Plan Map, criteria for its selection are discussed in Supporting Report 7, but a feasibility study will be required before any final decision is made.

2.3.3 Phasing of Development

The Regional Plan covers development activities and their phasing up to 1990. The phasing of development has been indicated above in Sections 2.3.1 and 2.3.2. It is also shown on the Regional Plan and Action Programme Maps at the rear of this Report, and in greater detail in Map Numbers 21 and 22 in the Map Folder. Development during the Action Programme Period (1975 to 1980) has been planned in detail, as required by the Scope of Work, and is described in Chapter 3 and in Annexure II. The agricultural activities are the major determinants in phasing and, as has already been explained, priority has been given to those areas that are easily accessible from existing roads and from which the forest has already been harvested, leaving only salvage logging to be done before clearance for agriculture. In the later phases of the Plan virgin forest areas are planned to be progressively developed, coordinating forest harvesting with the release of land to agriculture.

A general picture of the planned phasing of development is given below:

1974-1975 Large-scale Government and private agricultural activities continue in the Lambir-Subis RDA.

The tempo of salvage logging and forest harvesting is increased in all presently licenced forest areas destined for allocation to agriculture. This affects the RDAs Lambir-Subis, Niah-Suai, Sekudong, Labang-Tubau and Bintulu.

- 1975-1976 Large-scale Government agricultural development starts in the Niah-Subis RDA and continues till 1982. Road based improvement of agriculture starts in Marudi and Bintulu RDAs. Large timber industry complexes start in the Bintulu, Sekudong, Niah-Suai and Long Lama RDAs.
- New roads to Long Lama and Labang are completed.
- 1977 Road based improvement of agriculture starts in Long Lama and Sekudong RDAs.
- New road to Tubau is completed.
- 1978 Road based improvement of agriculture starts in Labang-Tubau RDA.
- 1979 Large-scale private agricultural development starts in Labang-Tubau RDA.
- 1980 and 1981 Work continues on development already started.
- 1982-1983 Large-scale agricultural development starts in the Sekudong RDA and continues till 1987. Two of the large timber complexes extend their activities into the Nyalau RDA.
- 1984 }
1985 }
1986 }
1987 } Continuation of the development already started and further construction of the road network.
- 1988 Large-scale Government agricultural activity starts in the Nyalau RDA.

The rate of agricultural development in the Niah-Suai RDA between 1976 and 1982 is limited by the speed at which forest harvesting can be completed. Agricultural development in the Sekudong RDA could begin earlier (by about 1980) by which time forest harvesting on some of the forest land destined for agriculture will have been completed. However, up to 1981 the SLDB will be fully occupied in the Niah-Suai RDA and private enterprise occupied in the Labang-Tubau RDA.

In scheduling the various activities necessary to convert virgin forest into productive agricultural land, efforts have been made to postpone investments such as in road building, until they are needed, because the financial benefits from investment in the agriculture which is based mainly on perennial crops will be long delayed. This makes it particularly important that full and expeditious harvesting of forests should take place as planned. This will provide an early source of revenue from land destined for agriculture and thus contribute to the general economic feasibility of the programme.

2.4 ECONOMY

2.4.1 General

In this section the overall economic situation is shown as it would be after implementing the Regional Plan supplemented by other activities not incorporated directly in the Plan.

The money values on which the analysis is based are likely to change over time, partly because of changed relationships between the individual factors of production (land, labour, plant and commodities), and partly because of general inflation. However in the economic and financial analysis, development has been studied over time in real terms, and all money values are stated at constant 1972/73 prices.

A special problem has to be faced in connection with price fluctuations. For Sarawak as well as Malaysia as a whole, exports and imports constitute a significant proportion of the total National Product, and changes in the terms of trade can have a very important impact on the real economic situation of the country. It is sufficient to point out the importance of rubber prices, which have tripled between the commencement of this study in April 1972 and the beginning of 1974, and crude oil prices, which doubled from one day to the next. Such fluctuations in terms of trade have a real effect on Malaysia's and the Study Area's economy. Higher rubber prices make Malaysia richer even if production and technical productivity per worker have not increased. However, such fluctuations cannot reasonably be forecast for long-term planning. The planning processes in this Report have, therefore, assumed a constant annual rate of growth per capita within the main sectors of the economy and no attempt has been made to forecast changes in terms of trade. Thus the estimates could be too optimistic if the prices for main export products decline for long periods—and too pessimistic if the opposite occurs.

2.4.2 Present (1970) Economic Situation

To establish a base for the evaluation of the economic consequences of the Plan an analysis of the economic situation in the Study Area in 1970 was undertaken. This is the starting point for plans and forecasts for the following 20 years. The economic consequences of the Plan must be seen in the context of the overall situation of Malaysia and Sarawak. Brief characteristics of these are given below.

Malaysia

By about 1970 Malaysia had developed into a relatively prosperous country with a steady tempo of development. This is evident from the approximate figures given in the Table 2.6.

TABLE 2.6 MALAYSIAN GROSS NATIONAL PRODUCT PER CAPITA

	\$	Growth rate %	Equivalent US\$	At exchange rate 1 US\$ =
1970	1,070	3.4	357	3.0 \$
1971	1,085	1.4	362	3.0 \$
1972	1,120	3.2	415	2.7 \$
1973	1,160	3.6	464	2.5 \$

The basic production of the country is agriculture and forestry, accounting in 1970 for:

50 to 55 per cent of the employment, 33 per cent of the GNP and 60 per cent of export value.

Until recently there has been little change in the production structure, but the situation is now changing rapidly. In 1972 the real output rose by about 6.75 per cent over the 1971 level. This performance was consonant with the average annual growth target of the Second Malaysia Plan. Output in agriculture, forestry and fishing expanded at a much slower rate than in the previous year due mainly to the depressed state of rubber and rice production. Rubber production stagnated in 1972 and the output of rice rose by only 1.5 per cent, while output of timber, especially sawn timber, and palm oil rose rapidly. This slackening was moderated during the year by a steady growth of mining output and a continuing high level of activity in manufacturing, construction and certain service industries. The annual rates of growth of output were 12 and 14 per cent in the manufacturing and construction industries respectively. Growth in manufacturing production was twice that of aggregate output; this sector now accounts for close to 15 per cent of the gross domestic product. The leading growth industries were those producing wood-based products (the output growth in 1972 being 22 per cent), textiles (26 per cent), basic metal products (15 per cent), and chemicals and chemical products (18 per cent). The manufacturing and construction sectors together accounted for nearly one-fifth of the gross domestic product.

It is the Government's intention to maintain this rapid rate of development in the future, and a quoted Government aim is that Malaysia should have an industrial economy by 1990. Accordingly the contribution of the manufacturing sector to the GNP should be raised from the present 15 per cent to something like 30 per cent by 1990. To achieve this will require an overall annual growth rate of six per cent up to 1990 and the manufacturing sector must grow by 10 per cent annually.

Malaysia has a large foreign trade; exports and imports each constitute 40 to 50 per cent of GNP. The foreign trade pattern is illustrated in Table 2.7 which is based on 1970 figures.

TABLE 2.7 MALAYSIA'S FOREIGN TRADE PATTERN

<i>Export products, per cent of total value</i>						
Agriculture	...	...	...	...	...	44
Forestry	...	...	...	...	...	16
				Sub-total	...	60
Mineral	...	...	...	...	...	26
Manufacturing, etc.	...	...	...	...	...	14
				Total	...	100
<i>Import products, per cent of total value</i>						
Manufacturing, machinery, transport, equipment						53
Raw material	...	...	...	...	...	27
Food	...	...	...	...	...	20
				Total	...	100

Sarawak

Sarawak is geographically separated from Peninsular Malaysia where the economic centre of gravity and the international connections of the Nation are located. Sarawak has been developed at a different rate from Peninsular Malaysia as a whole, and it has some very special social and economic problems connected with transforming the shifting cultivation of hill padi into more remunerative and agriculturally sound production practices.

In comparing Sarawak with Peninsular Malaysia on the basis of 1970 figures, it is found that:

- a larger proportion of the population in Sarawak lives in rural areas; 79 per cent compared to 58 per cent;
- the average GNP per capita in Peninsular Malaysia is \$1,101—in Sarawak \$1,005.

The last rather modest difference is noteworthy because, considering that agriculture in Sarawak is contributing significantly less per capita than in Peninsular Malaysia, other industries must obviously have contributed much more. These industries are forestry and oil production.

Forestry increased its economic output by 17 per cent annually in the 1960's, and by 1970 it was contributing 15 per cent to the GNP of the State compared to 1.8 per cent in Peninsular Malaysia. The forestry policy is now aiming at an increased utilisation of the wood resources for domestic production of sawn timber, and other processed and manufactured goods. This policy will be implemented by Sarawak Timber Industry Development Corporation, mainly through the establishment of a number of large timber complexes in different parts of Sarawak.

The oil industry was, in the past, based mainly on importing crude oil from Brunei, some of it being re-exported crude and the rest refined at Lutong for export. Recently however, there has been an increasing separation of operations between Brunei Shell Berhad and Sarawak Shell Berhad, resulting in a rapidly rising utilisation of Sarawak's off-shore oil deposits. Current production is estimated at around 100,000 barrels per day. In future crude oil production, refining and export will be an important item in the economy of Sarawak; the more so because of the recent sharp rising in crude oil prices. But because of the large element of foreign capital and expatriate staff, a significant proportion of this economic output will accrue, or end up, outside Sarawak.

Sarawak has—like Peninsular Malaysia—a significant import and export trade, amounting to \$660 mn and \$671 mn respectively in 1970, which was approximately 70 per cent of the GNP for Sarawak in that year. In the period 1960 to 1972 there was a total trade surplus of \$150 mn, and in the years 1968 to 1972 there have been surpluses each year, totalling for the five years \$330 mn. Sarawak's import is spread over a wide range of items; food, building materials, machinery and equipment whereas its export is concentrated on a few products. Ignoring oil products the distribution of exports in 1970 was as follows:

	(per cent)
Logs and wood products	58
Pepper	16
Rubber	7
Others	19
	<hr/>
	100
	<hr/>

In view of the National aim—that all regions and all racial communities shall equally enjoy the benefits of Malaysia's development—it can be expected that special efforts will be made to utilise Sarawak's natural and human resources to bring it, and keep it, in line with the rest of the Nation. Progress in this direction is already well established as is evident from a statement made in connection with the Mid-Term Review of the Second Malaysia Plan:

“Sarawak's Gross Domestic Product (GDP) at factor cost increased from \$427 million in 1961 to \$1,067 million in 1972, an increase of 150 per cent in eleven years. The average rate of growth over this period was 8.7 per cent per annum. For the period 1961 to 1966, the average annual rate of growth was 8.9 per cent, whereas for the period 1967 to 1972 it was 9.2 per cent, indicating that the economy of the State has grown faster in recent years than in the early 1960's. Over the period 1970 to 1972 the State's GDP grew at an average rate of 11.4 per cent per annum. Thus the State's economy grew more rapidly than the National economy.

The per capita income of the State has also increased over the eleven-year period, from \$588 in 1961 to \$1,038 in 1972, i.e. almost doubling itself in slightly over a decade. Even allowing for the general increase in prices, this growth per capita GDP can still be considered as substantial”.

The Study Area

Based on aggregated figures for the GRP per capita, the Study Area is revealed as a relatively prosperous region in Sarawak. In 1970 the GRP per capita amounted to approximately:

		\$	Per cent of rest of Sarawak
Excluding oil production	... ..	1,200	150
Including oil production	... ..	1,700	200

The incomes originating from oil production and forestry have played an important part in the economic picture of the Study Area, as is apparent in Table 2.8.

TABLE 2.8 GROSS REGIONAL PRODUCT 1970 AT FACTOR PRICES
IN THE STUDY AREA AND IN SARAWAK

Sector	Study Area		Sarawak		Study Area in % of Sarawak
	\$Mn	%	\$Mn	%	
Agriculture	19.9	14	201	24	10
Forestry	62.0	44	148	18	42
Manufacturing (excluding oil)	13.5	10	117	14	11
Transport and commerce	24.5	17	177	21	14
Services and dwellings	21.8	15	186	23	12
Sub-total	141.7	100	829	100	17
Oil industry	55.4	39	55	7	100
Total	197.1	139	884	107	22

TABLE 2.9 ORIGIN OF GROSS REGIONAL PRODUCT BY MAIN SECTORS OF PRODUCTION

	Production value (='value added')	No. of employed	Production value per employed	Per cent of	
				employed per sector	Production value per sector
<i>1970</i>			\$	%	%
Agriculture ...	\$1,000	21,000	825	54	12
Forestry ...	17,500	4,000	16,125	10	44
Manufacturing ...	64,500	4,500	3,225	12	10
Services ...	14,500	9,500	5,325	24	34
Total ...	50,500	39,000	3,775	100	100
	147,000*				
<i>1980</i>					
Agriculture ...	47,700	32,000	1,500	53	16
Forestry ...	114,125	5,500	20,750	9	38
Manufacturing ...	46,775	8,500	5,500	14	14
Services ...	95,250	14,000	6,800	23	32
Total ...	303,850	60,000	5,050	100	100
<i>1990</i>					
Agriculture ...	133,450	50,000	2,675	50	19
Forestry ...	159,350	6,000	26,550	6	23
Manufacturing ...	197,425	21,000	9,400	21	29
Services ...	200,325	23,000	8,700	23	29
Total ...	690,650	100,000	6,900	100	100

* This figure included the local wage share of the oil industry.

The relative importance of the separate main production sectors can be gauged by comparing each figure in the last column with the Study Area's share—12 per cent—of Sarawak's total production. Forestry and the oil industry are clearly leading.

Although the GRP per capita is significantly higher in the Study Area than in the rest of Sarawak, it is distributed very unevenly, with the larger share going as return to invested capital and as salaries to technical and managerial personnel in the forestry and oil industries. The Government's policy and the Consultants' recommendations aim at increasing the number and types of jobs in the Study Area whereby people can earn a reasonable income—higher than the present average—and thus contribute to a more even distribution of income.

2.4.3 The Perspective Plan—Economic Projections

This section describes the future potential of the Study Area in economic terms based on the natural and human resources and on their planned utilisation. The origin and use of GRP and the overall economic balance are discussed.

Origin of Gross Regional Product

The contribution to the GRP of the four main sectors of production (agriculture, forestry, manufacturing and services) is shown in Table 2.9 which gives estimates of the situation in 1970, 1980 and 1990. These estimates arise from studies of the present situation based on official statistics and information gathered by the Consultants. The outcome of these investigations has been the base material for compiling an Input-Output Matrix, showing in money terms the sum of transactions within one year between all sectors of production.

While the matrix for 1970 depicts, as closely as possible, the actual situation, the matrices for the future are based on estimates of how the various buying-and-selling relations between the sectors—the technical coefficients—will develop under the impact of new technology and new market situations. The Input-Output Matrix is further explained in Supporting Report 9.

During Phase I of the Study various alternative models of the future development were tested. As a result a single set of assumptions and conclusions was evolved which resulted in the figures presented in Table 2.9. The development assumed in Table 2.9 implies the growth rates shown in Table 2.10.

TABLE 2.10 GROWTH RATE FACTORS BY MAIN SECTORS OF PRODUCTION

	1970/80	1980/90	1970/90	Growth factor 1970/80 per employed	Growth factor 1980/90 per employed
	%	%	%	%	%
Agriculture	10.6	10.8	10.7	6.0	6.0
Forestry	5.6	3.4	4.6	2.5	2.5
Manufacturing	12.4	15.5	13.9	5.5	5.5
Services	6.6	7.7	7.1	2.5	2.5
Average for all sectors	7.5	8.5	8.0	3.0	3.2

The Table 2.10 shows that with implementation of the Plan agriculture and especially manufacturing are expected to grow at rates above the average for all sectors, while forestry and services grow at lower rates. If the table is compared to Table 2.3 the following short explanations for the expected growth development can be given:

- for agriculture: the increase in the number of employed is close to the average for all sectors and a very substantial increase in production per employed due to modernisation of the sector;
- for forestry: modest rates of growth for both employed and production per employed due to the fact that this sector, which does not comprise the timber industries (manufacturing), by 1970 employed a considerable number of people and because improved equipment and methods are expected to reduce relatively the demand for labour;
- for manufacturing: growth rates for both employment and production per employed considerably above average;
- for services: employment growing at an average rate, but production per employed at a rate well below average.

The size of the growth rates in Table 2.10 may be disputed, and variations over the Plan period are only to be expected. However, the rates in the Table appear reasonable to the Consultants in the light of expected developments within the individual sectors. Thus, the major growth in productivity expected within the new agricultural areas has been modified by the limited growth expectations within the traditional agricultural sector.

Growth in productivity in the forestry sector is based on experiences in Peninsular Malaysia and, though the actual logging operations might be improved only marginally, a certain improvement could result from changed skidding techniques. Also the improvement of sawmilling, which is included in the forestry sector, will contribute to an increased production per employed. The fact that most circular saws will be replaced by modern rigs in the next few years indicates that the assumed annual growth of 2.5 per cent in labour productivity could be an underestimate.

Growth in the manufacturing sector, amounting to 5.5 per cent per year, is calculated as the weighted average of the present small manufacturing sector and the expected future major industrial expansion of the Study Area. The increased productivity is consequently close to the growth rates experienced in an expanding industrial sector.

The growth of labour productivity in the service sector is a complex figure which is based on more general observation in developing countries.

Use of Gross Regional Product

Annual GRP is distributed on the following main purposes:— private consumption, public consumption, private investments, public investments and total savings.

Savings are normally used for investments, either by the person himself or— through lending operations, possibly via banks and other financing institutions— by other persons. The State of Sarawak has been shown to have had surplus revenues for a number of years; similarly, private savings in the Study Area have

exceeded private investments. In future, investments in the Study Area will exceed the total savings and, accordingly, there will be need for loans and grants to fill the financial gap, as is shown in Table 2.11.

TABLE 2.11 PRESENT AND FUTURE RELATIVE DISTRIBUTION OF GRP FOR THE STUDY AREA (per cent)

	1970	1980	1990
Private consumption	70	66	65
Public consumption	10	13	13
Private investments	5	19	9
Public investments	7	14	7
Total savings	20	21	22
Financial surplus (+) or deficits (-)	+ 8	- 12	+ 6
GRP	100	100	100

The growth of GRP is estimated rather conservatively. The distribution to various uses is seen to be changing over the years as shown in Table 2.12.

Tables 2.11 and 2.12 together show that, in spite of a 3.4 per cent growth in per capita GRP, private consumption per capita is expected to grow at a slightly lower rate, namely by 3.0 per cent annually, while the other uses—private savings and public consumption and savings, all increase at higher rates. This is normal and to be expected in a developing region. The result is that although the consumption per capita is growing, private consumption's rate of GRP is decreasing.

This distribution of the GRP over main uses can be deliberately influenced to some extent and would therefore be an essential political problem. The question would be: which is more important?—the wish for rapidly increased consumption, or the demand for increased investment and public services, leading in the long term to increased private consumption? If private consumption increases at a higher rate than stated in the tables, then the result would be:

- (a) either a reduction in investment and public consumption, and accordingly a reduced rate of development, or
- (b) a larger financial gap with a correspondingly increased burden on future generations to repay the loans.

With this description of the development of GRP and its distribution to main uses as a basis, the following section discusses the overall economic and financial balance of the development in the Study Area.

The Overall Economic Balance

In this section a summary is given of the overall financial requirements for the whole Plan period; here the concern is with the financial gap and loan requirements as shown in Tables 2.12 (Use of GRP) and 2.13. In Chapter 3, the Action Programme, further details for the period 1975 to 1980 are given.

TABLE 2.12 USE OF GRP—1970-1980-1990

	1970	Growth rate 1970/80 per cent	1980	Growth rate 1980/90 per cent	1990	Growth rate 1970/90 per cent
GRP	147	7.5	305	8.5	690	8.0
GRP per capita	1,280	3.4	1,795	3.5	2,510	3.4
GRP per employed	3,770	3.0	5,050	3.2	6,900	3.1
Private consumption	103	6.9	200	8.4	445	7.7
— per capita	895	2.6	1,175	3.3	1,620	3.0
Public consumption	16	9.9	40	9.0	95	9.3
— per capita	135	5.6	235	3.6	345	4.7
Private investments	7	20.0	55	0.9	60	14.2
— per capita	60	18.4	325	—	220	6.8
Public investments	10	16.2	45	—	45	7.8
— per capita	85	12.0	265	—	165	3.4
Total investments	17	19.4	100	—	105	9.5
— per capita	145	14.7	590	—	385	6.5
Total savings	29	8.4	65	8.7	150	8.6
— per capita	250	4.3	385	3.9	545	4.1
"Financial gap"	+ 12	—	— 35	—	+ 45	—
— per capita	+ 105	—	— 205	—	+ 160	—

TABLE 2.13 TOTAL LOAN REQUIREMENTS 1975-1990 FOR THE STUDY AREA (million dollars)

	1975/80	1981/90	1975/90
Financial requirements	665	925	1,590
Total regional savings	325	1,025	1,350
Financial gap	- 340	+ 100	- 240
Grants	75	165	240
Loan requirements	265	0	0
Loan repayments	0	265	0

The grants shown in Table 2.13 are amounts expected to be invested in the Area by the State and Federal Governments to stimulate development. The total financial gap—a maximum of \$350 mn. does not include interest. If repayment does not begin until 1985 compound interest would have to be added to this amount. Assuming an eight per cent annual interest rate, the total financial gap in 1985 would be increased to approximately \$700 mn. If this amount, including an interest of eight per cent per year on the amount owing, were to be repaid out of the annual Regional surplus savings after 1985, the repayment period would be 20 years (provided an annual growth of six per cent in the GRP is achieved).

In order to evaluate the economic impact of this debt burden it has to be looked at in the context of the total annual Regional savings, which for 1990 have been assumed to be 22 per cent of GRP. This amount is considered the maximum regional contribution to the annual investments. If, in the period 1991 to 2000, ten per cent of GRP were used for servicing the debt, the amount left for gross investments would be 12 per cent of GRP. This does not appear to be unreasonable, but it would involve a period of decreased development activity, which is only natural after a period of such concentrated capital input as would result from the present Plan. The investment industries, particularly building and construction, might face some transition difficulties. The adverse effects could possibly be mitigated by:

- (a) certain (but decreasing) capital import (borrowing),
- (b) a transfer of investment industries to other parts of Sarawak.

2.4.4 Finance

According to the "Mid-term Review of the Second Malaysia Plan" (p 47), the total investments in all Malaysia would amount to \$3,662 mn by 1975. The annual growth rate for investments during the Second Malaysia Plan is estimated at 12 to 13 per cent. If this growth rate were maintained through the following ten years up through 1985 the total investments would amount to approximately \$65,000 mn. In this same period the Study Area will need a total investment of \$1,000 to \$1,100 mn corresponding to 1.7 per cent of Malaysia's total investments. This does not seem unreasonable, taking into consideration that the population of the Study Area by 1990 would also be 1.7 per cent of the Malaysian Total.

If the annual growth rate of Malaysia's total investments amounted to only six to seven per cent the Study Area would absorb two per cent of the total

investment in the period 1976 to 1985, which still does not seem unreasonable considering:

- (a) the concentrated development effort in this period, and
- (b) the fact that the Study Area from 1985 could produce sufficient savings to sustain its own investments.

The calculations made here are intended to measure the financial requirements of the planned development in terms of repayment and interest payment capacity of the Study Area and in terms of the Study Area's share of expected future investments in the whole of Malaysia. Measured in this way the financial requirements, although considerable, do not appear to be out of proportion with the ability of the Area to liquidate the debt and still continue developing. The overall conclusion, therefore, is that financially and economically the Plan is sound and viable.

2.4.4.1 Application of Funds

Money for development will be used both by private entrepreneurs and by public bodies. For the Action Programme Period (AP period) detailed estimated expenditures are given in Chapter 3 and in Annexure II as well as in Supporting Report 10. For the rest of the Plan period (1981/90) more general estimates are given in Section 2.4.3. The AP-period will be characterised by heavy investments undertaken by the public sector, partly in infrastructure and social services and partly in developing agriculture and other production activities.

In the AP-period the investments will be divided between the public and private sectors. The public sector investing \$405 mn (60%) and the private of \$665 mn. Investments would be divided by both investors between public and private sectors, the public sector receiving \$225 mn (33%) and the private sector \$440 mn (67%).

The application of funds for recurrent expenditures has been worked out for the projects recommended in the AP-period and they are shown in Chapter 3. A general indication of the growing trend of public recurrent expenditures is given in Section 2.4.3 under the economic term; 'public consumption'.

2.4.4.2 Sources of Funds

Public Sector

The public and semi-public (such as SESCO) sector obtains its funds:

- (a) through recurrent revenues such as taxes, fees, licences, royalties, duties and a direct payment for certain services (water, electricity), and
- (b) through loans which can be domestic or foreign.

Recurrent revenues: a general review of these is outside the Scope of Work for this Study. A general increase in taxing is an assumption incorporated in the Plan as shown in Section 2.4.3. The increase would be both absolute and relative, that is taxation would monopolise an increasing share of the GRP. The Consultants have made recommendation for collecting recurrent revenue, namely the Land Rent, which is briefly described later in this Chapter and more fully in Supporting Report 9.

Loans: the Government can supplement its financial potentials by borrowing either from domestic or from foreign sources. It is to be expected that extensive

regional development, such as is recommended in the Plan, cannot be financed by capital (savings) originating within the Region alone. The Region must rely on grants and loans for a partial covering of the total investment costs. The financial gap and the volume of loan requirements have been shown and discussed in Section 2.4.3.

The division of the loan requirements between grants from State and Federal Governments, domestic and foreign borrowing will be decisions made by the two Governments in the light of the Nation's general situation and the background presented in this Report.

Several of the projects described in this Report will be eligible for financing through international institutions. Such loans would be made to the Federal Government. The Consultants have made recommendations for stimulating domestic saving namely 'Sarawak Savings and Development Fund' and 'Premium Bonds'; both of these are summarised later on in this Chapter and treated more fully in Supporting Report 9.

Financial Policy

Funds—or capital—are not in themselves a real resource of production, but a means of allocating scarce real resources to various production and activities. By manipulating allocations the Government can influence the distribution of activities on various sectors of the economy and the general level of activity in the society. By collecting taxes and revenues of all kinds the Government absorbs purchasing power, thus reducing the private consumption and savings. By surplus budgeting the Government can exert a contractive influence on the economic activity; by deficit budgeting exert a stimulating or expansive effect. In recent years the State Government has changed its attitude from the contractive to the expansive line. Implementation of the Plan will further increase the expansive tendencies.

Private Sector (Commercial Credit)

Savings from the private sector will originate in the households as a part of income, and in the business enterprises as part of the surplus. The expected total amount originating from the private sector has been discussed in Section 2.4.3. In addition to the Regional savings, private savings from other parts of Sarawak or Malaysia may be invested in the Study Area, but they would then, in a regional planning context, be classified as loans.

The investments in the private sector will be based on household and business savings, on direct participation by Government and through the private credit service system.

At present, the more developed credit service system is concentrated in the towns where it mainly covers short-term credit requirements. The banks operate as savings institutions, and only a part of the funds acquired from the Region is canalised back into the local economy. A modern banking service primarily aims at a more developed money economy, for which reason its operations are both functionally and geographically concentrated around the more advanced trades and industries in the major towns. This is emphasised by the fact that the agricultural sector only accounts for one per cent of total loans and advances from private financial institutions.

Mortgage institutions have as yet only limited importance as sources of credit. The basis for these institutions is the traditional real estate security, but their loans are usually on relatively short-term conditions running only for 10 to 15 years.

Besides the banks and mortgage institutions a few companies operate as financing agencies. They usually offer a fraction higher interest on long-term deposits, but in general their working field is largely covered by medium-term, ordinary banking business. Their main activity seems to be concentrated on loans for, and with security in, transport equipment and machinery. These financial institutions are often corporately connected to established banking firms.

In addition to institutionalised credit there is trade-based credit, which for rural families implies that the shopkeeper is often a source of productive capital, supplying financial backing for opening new holdings or developing new crops. Usually the credit is in the form of goods or farm requisites and repayment is made later by the sale of agricultural products. Because of competition between shops and the danger of non-payment, the credit, is as a rule, supplied on favourable terms and there is rarely a direct charge for the service, although indirect charges may be made in the form of price adjustments or lower grading of local products. Repayment schedules are generally flexible and most shopkeepers are interested in keeping a sum outstanding in order to maintain trading relations with their customers. Credit is supplied on the basis of trust and personal knowledge; a farmer's credit-worthiness is gauged more on his repayment record than on his farming ability. The system restricts the number of credit customers a shopkeeper can, or will, carry. Consequently, there is a need for further development of financial institutions, particularly as suppliers of agricultural credit. Besides the shopkeeper, existing co-operative societies and the Co-operative Central Bank Limited engage in rural lending activity, but on a limited scale.

In Supporting Report 2, Part III recommendations are made that credit for specific agricultural enterprises in the intensive development areas should be provided through the Agricultural Development Unit, which would also provide all supporting services. In this way, the use of credit would be supervised and repayment could be linked to marketing arrangements for the major enterprises. In addition to this it may still be advisable to retain a traditional trade/credit system to finance personal loans for family events such as weddings. This credit could be based on marketing through this traditional system the produce of minor agriculture enterprises such as pepper, poultry, pigs and vegetables.

In addition there will be need for credit to those who take up farming on a larger scale within areas planned for private independent farmers. The Consultants consider that the present credit organisations are adequate and sufficient to carry out these tasks, but believe that they should participate more fully in the economic opportunities offered by this type of enterprise.

The Land Rent mentioned below should render superfluous the need for credit to farmers for purchasing smallholdings developed by SLDB, and the Sarawak Savings and Development Fund, also mentioned below, could cover the need for financing the purchase or building of houses and other structures.

2.4.4.3 Recommended Financing Arrangements

Brief descriptions are given here of proposals for financing. Details of the proposals are given in Supporting Report 9.

Land Rent

According to the Plan the Government will develop unoccupied State Land and it will improve farming in legally occupied land by means of road-based improvement schemes. It is recommended and assumed in the Plan that the beneficiaries will pay for these benefits according to their ability to do so. This payment can be arranged in different ways:

- (1) as a cash payment sale, where the selling price should cover the costs of clearing and developing the land, and of building up the necessary infrastructure. However, the vast majority of the people who the State wishes to attract to these schemes as smallholders would not be able to meet such costs;
- (2) as a fixed annual payments—an annuity—over say 20 to 25 years; the amount should be sufficient to cover repayment of the full investment cost with additional payment of interest on the amount owing. Such an arrangement would be rigid leading to:
 - (a) difficulties in maintaining regular payments in periods of falling prices of the respective farm products, and
 - (b) generation of unearned incomes in periods of rising prices. These in turn could lead to higher sales prices for the land; this of course would be to the benefit of the present owner when he sells the land, but would be a burden for the buyer who, in case of falling prices later on, could run into the same difficulties as mentioned under (a). If numerous farmers faced such problems it could necessitate Government support.
- (3) A Land Rent system; this is the method favoured by the Consultants and is recommended for more detailed study, Land Rent implies:
 - (a) that State Land should not be sold but should be allocated on leasehold to users who would then obtain a 'usufructuary right' to the land including:
 - right to cultivate the land according to rules laid down by Government;
 - right to have the disposal of the output of the cultivation;
 - right to pass the usufructuary right to intestate successors on conditions corresponding to the original ones;
 - obligation to pay Land Rent.
 - (b) that the Land Rent should be calculated so that it would cover the payment of a reasonable interest on the development cost, including a writing-off of perishable items such as trees. The Land Rent should, however, be flexible which could be obtained through an annual adjustment, which should allow for:
 - fluctuations in sales prices of farm produce;
 - general price increases—inflation;
 - increases in personal incomes within other corresponding occupations, in particular labourers in the towns.

The expected advantages of the Land Rent would be:

(a) to pass the risk and chances connected with price fluctuations from the user to the State, implying that:

“Sarawak is rich when produce prices are high—and poor when they are low”. In contrast to this a sale of the land under conditions referred to under paragraphs 1 and 2 above would imply that: “Farmers are rich when prices are high—and poor when they are low”. Under the Land Rent system the farmers’ income would be relatively stable;

(b) to obviate payment of an initial sum by a farmer taking over such land, whether he is the first or a subsequent user;

(c) to prevent land speculation because the Land Rent would be adjusted in accordance with the value of land and its production;

(d) to reward particular skill, diligence and efficiency because the Land Rent would be based on the estimated output of a standard or average farmer. Those farmers operating above that level would therefore directly benefit from their efforts;

(e) to reduce the inclination of rural people to migrate to towns because real income of the farmer would be compatible to that of urban workers;

(f) to promote effective land use; the Land Rent would be based on average production from land assuming it is being effectively used;

(g) to select able farmers because those persons unable to pay the Land Rent would have to pass on the land to more able persons;

(h) to facilitate a desirable distribution of land between ethnic groups because the economically stronger would not be able to buy out the weaker;

(i) to provide a flexible and permanent contribution to the revenues of the State; these would, in case of rising prices, increase to the benefit of all citizens, and with falling prices the burden would likewise be spread.

To operate a Land Rent system efficiently would require a careful and well functioning administrative organisation, but this requirement would also apply to a system whereby the land is sold on the basis of annual payments.

The Land Rent system can, in a modified form as Incremental Land Value Rent, be extended so that it embraces also non-State land and it could be applied to urban land.

Sarawak’s Savings and Development Fund

The purpose of such a fund—SSDF—would be:

- to increase the private savings in money deposits and, at the same time, reduce the inclination of saving in kind such as land, fixtures and gold;
- to create credit for development purposes;

- to introduce a monetary saving system, which would meet some of the new demands arising from people living in a money economy as opposed to a subsistence economy.

The ways of achieving the purposes could be:

- to revalue continuously the deposited amount in accordance with a statistically calculated price index; in this way the real value of the deposits would be maintained;
- to settle lending conditions correspondingly; the advantage for the borrower would be a low initial interest;
- to establish a number of medium-term and long-term savings arrangements for children's education, retirement and the like;
- to create a widespread network of area banks giving people all over the Region an easy access to a bank office.

Premium Bonds

Premium bonds are suggested as a means of increasing savings and, at the same time, provide a rather harmless outlet for the gambling spirit. Bonds would be both securities and lottery tickets but would carry no interest; the total interest obtained from lending out the proceeds of the sale of bonds would provide the funds for the lottery payments. The bond itself could be transferable and, after a number of years, redeemable. For both practical and constitutional reasons the system must be organised by the Federal Government.

CHAPTER 3

THE ACTION PROGRAMME (1975-1980)

3.1 INTRODUCTION

In accordance with guidelines in the Scope of Work a detailed Action Programme covering all sectors and institutional aspects has been drawn up for the six year period 1975 to 1980 (the AP-period). The reason for including the year 1975, which is the last year of the Second Malaysia Plan, is the wish of the Governments to commence development in the Region as soon as possible after completion of the Study. The programme for the period 1976 to 1980 will be part of the Third Malaysia Plan. However, it cannot be emphasised too strongly that the development planned for the AP-period is only the beginning of, and an integral part of, the Regional Plan. It should not be thought of simply as a Phase I development, treated in isolation and unrelated to further progress after 1980. It is considered vital that development started in the AP-period should be continued steadily onwards into the future. The detailed Action Programme provides a blue print for initial implementation; the Regional Plan provides an overall to what is seen as a comprehensive, and necessarily highly integrated, programme.

The Programme presented in this Chapter is an outline of detailed proposals contained in the Supporting Reports and it summarises the investments throughout the Regional economy over the period from January 1975 to December 1980. In a purely physical context, however, the time span of the Programme is not quite so precisely defined, since some salvage logging of forest areas destined for agricultural development has already started; and in agriculture some of the activities associated with clearing and preparing land in the final phase of the Programme extend into 1981.

In Section 3.2 the expected results of implementing the Action Programme are described; the build-up year by year of population, employment and GRP in the Region.

In Section 3.3 a concise description is given of the physical components of the Action Programme by 1980. This is followed in Section 3.4 by a summary of the annual development by sector and by Government agency. Section 3.5 gives the summary of investments and a discussion of the relationship between investment need and possible sources of finance. In Annexure II the Programme is first described in terms of its component development packages. Each package is made up of a number of individual projects which are listed showing their sectoral and departmental affiliations, the implementation period and the investment costs year by year and in total. The Programme is also described in terms of its year by year implementation; each project started in a certain year is listed and grouped according to their sector classification. Within the groups they are distributed according to their departmental budget affiliation.

In this presentation the principal objective has been to offer a flexible basis for future decisions by Government, so that specific projects may be regrouped or re-ordered without affecting the general planning framework. To this end,

each project has been separately described on a Project Form which lists its content, its cost, its primary effect and its link with other projects. A complete set of these forms is presented in Supporting Report 10.

The formulation of the Action Programme is one of the last steps in the process leading from the generation of first ideas to the final decision by Government to implement specific projects. Discussions with the Steering Committee and individual Government agencies have been earlier steps leading to this Action Programme. By describing this Programme as one of the last steps, it is recognised that, even if the Government accepts the programme as it is, some changes can be expected. Thus, it must be possible for the Government to change details without having to rebuild the whole Programme. The Government should be able to:

- alter the ranking;
- extend the Programme over a longer period or compress it;
- substitute one or more projects by others or delete some projects.

At the end of the Report a diagrammatic presentation of the Action Programme is given and enclosed in the Map Folder are two maps showing more accurately the proposed development over the whole Study Area (Map numbers 21 and 22) at a scale of 1:250,000 and in the Detailed Plan Area (Map No. 20) at a scale of 1:50,000.

3.2 ACTION PROGRAMME PROJECTIONS

3.2.1 Population

Projections of the total population and the number of persons of working age (i.e. the age group 15 to 64) are shown in Table 3.1. The total population is expected to grow by about 20 per cent in the period—from 140,000 in 1975 to 170,000 in 1980 while the number of persons of working age is expected to grow at roughly the same rate, increasing from about 72,000 in 1975 to 88,000 in 1980; a total of 16,000.

3.2.2 Employment

Table 3.2 shows the cumulative total employment that is expected in the respective sectors resulting from the operation of projects started during the AP-period. The employment created during construction of the projects is not included. Due to the closing down or giving up of various existing activities during the period the total net increase in employment in the Study Area is somewhat smaller than the gross increase namely, 17,400 and 21,400 jobs respectively. In agriculture, for instance, the jobs created by road based improvement projects will contribute little to the net increase in agricultural employment because most of the persons taking part are existing farmers and shifting cultivators.

The most important job generating sectors are agriculture and manufacturing; together they generate 75 per cent of the total number of jobs. The remaining jobs are distributed fairly evenly over forestry, private services and the public sectors (transport, public services and public utilities).

3.2.3 Gross Regional Product

Table 3.3 shows the expected total Gross Regional Product (GRP) and its annual build-up per capita and per employed in the AP-period. The total GRP is expected to grow by about 45 per cent, from \$210 mn in 1975 to \$305 mn in 1980. But because of the population increase the GRP growth per capita will be at a lower rate than the total GRP; it is at about 20 per cent.

TABLE 3.1 ACTION PROGRAMME: POPULATION PROJECTIONS

	YEAR						Growth Rate (% per year)	Increase 1975-1980	
	1975	1976	1977	1978	1979	1980		Total	Per cent
Total Population	140,000	145,000	151,000	157,000	163,000	170,000	4	30,000	21
Age Group 15-64	72,000	75,000	79,000	82,000	85,000	88,000	4	16,000	21

TABLE 3.2 ACTION PROGRAMME: EMPLOYMENT CREATION BY SECTORS*

Sector	Cumulative Gross Increase in Jobs						Net Increase in Jobs 1975-1980
	1975	1976	1977	1978	1979	1980	
Agriculture	1,200	3,000	4,900	7,500	9,900	12,000	9,000
Forestry	200	1,000	1,700	1,700	1,700	1,800	1,400
Housing	—	—	—	—	—	—	—
Transport	—	—	100	100	200	200	200
Public Services	—	400	500	600	900	1,300	1,300
Public Utilities	200	200	300	400	400	400	400
Private Services	—	300	700	1,000	1,300	1,600	1,600
Manufacturing	200	1,100	1,700	2,600	3,500	4,100	3,500
Totals:	1,800	6,000	9,900	13,900	17,900	21,400	17,400
Annual Growth:	—	4,200	3,900	4,000	4,000	3,500	

* The figures refer only to employment engaged in operating Action Programme projects. The employment necessary for project construction is not included.

TABLE 3.3 ACTION PROGRAMME: GROSS REGIONAL PRODUCT PROJECTIONS

	YEAR						Yearly Growth Rate %	Increase 1975-1980	
	1975	1976	1977	1978	1979	1980		Total	Per cent
GRP \$ mn	210	230	245	260	280	305	7.5	95	45
GRP per capita \$	1,515	1,565	1,625	1,680	1,735	1,795	3.4	280	19
GRP per employee \$	4,370	4,500	4,630	4,675	4,905	5,050	3.0	680	16

The number of employed is projected to rise slightly faster than the population, therefore the expected increase in GRP per employed will be lower, predicted at about 15 per cent.

3.3 THE PHYSICAL COMPONENTS OF THE ACTION PROGRAMME

Given here are summaries mainly of the physical aspects, emphasising the development which will have taken place by 1980. Economic features of the developments are mentioned where it helps in describing the magnitude of the activity.

3.3.1 Agriculture

The agricultural development can be described under three distinct headings:

- Public Development of State Land
- Road Based Improvement in Legally Occupied Land.
- Private Development of State Land.

The locations of development are shown in Figure 3.1.

(a) Public Development of State Land

SLDB would have opened up roughly 55,200 acres of State Land of which about 7,450 would be for the NLC beef ranch and the Department of Agriculture's Livestock Production and Animal Husbandry Training Centre, and 2,900 would be for Igang sub-regional centre and six villages. Some 39,900 acres would be for development to agriculture and roughly 4,950 remain as forest enclaves. Of the agricultural land about 13,700 net acres would be a public estate in the Niah-Suai RDA and 500 acres added to the existing SLDB Subis public estate. The remaining 25,700 acres would be developed for eventual allocation to smallholders on the sub-schemes of Mera-a, Galasah, Sebanah, Lamaus, Ensabang and Telabit. By 1980 all the 39,900 acres of agricultural land would be cleared, but about 3,500 acres would not have been planted. A total of about 1,540 smallholder families would have been settled by 1980, but the majority would still be under the management of SLDB; only the Mera-a sub-scheme would have been handed over to the smallholders.

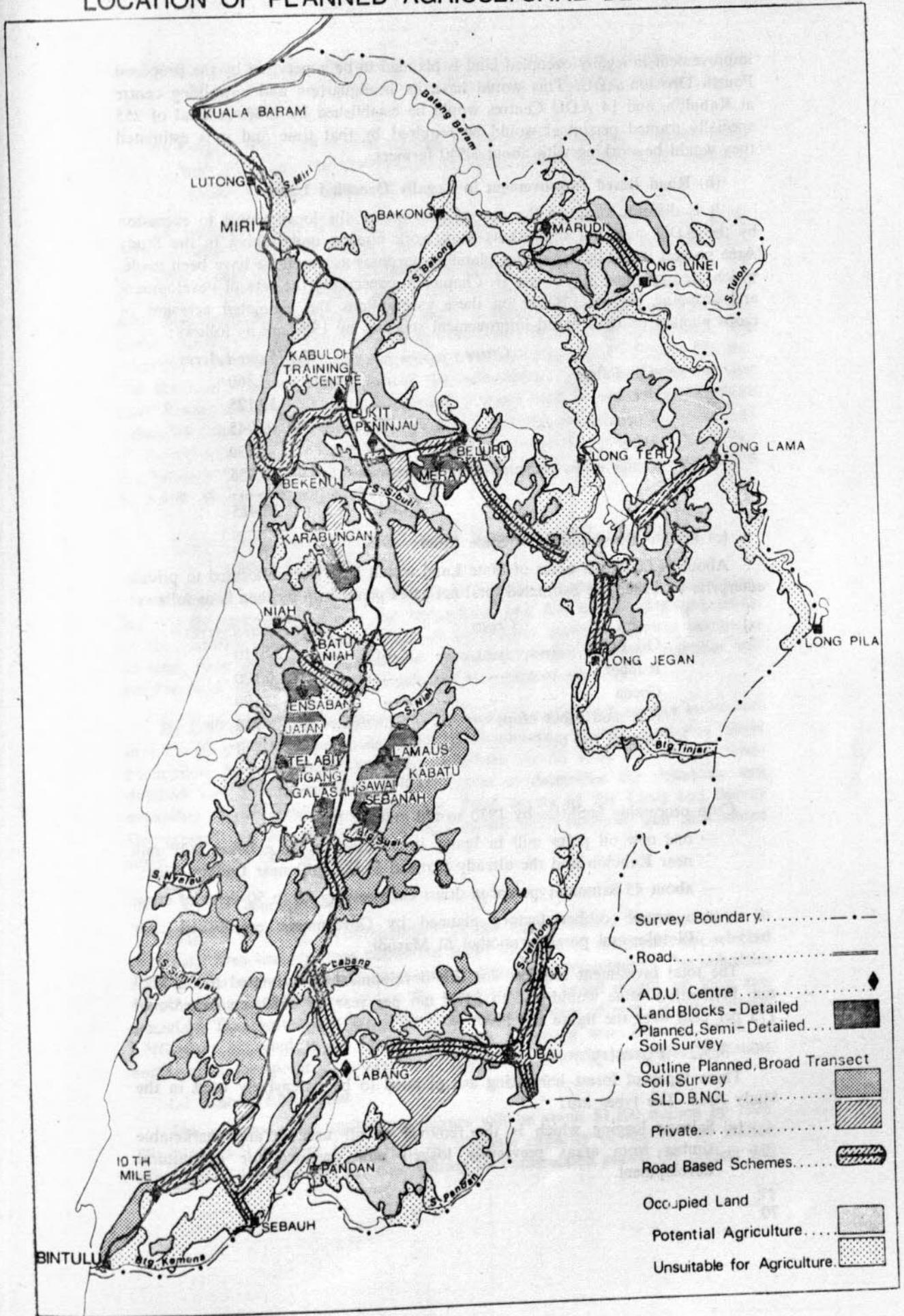
Land-use on the publicly developed State Land up to early 1981 would be as follows:

	<i>Crops</i>	<i>Net Planted Acres</i>
Oil Palms	26,065
Rubber	7,975
Cocoa*	2,385
Pasture for beef	7,450
Rice	1,430
Other small-scale crops	1,538
	Total ...	46,843

* Does not include 500 acres planned by SLDB to be planted in their existing Subis Scheme.

The development of land destined for allocation to smallholders would be a joint undertaking handled by SLDB, ADU'S and the smallholder. The proposed system of development and transference of management is explained in Volume II, Chapter 3. It is sufficient here to mention that all rice plots and homestead plots of smallholder settlers on publicly developed State Land, and all road based

LOCATION OF PLANNED AGRICULTURAL DEVELOPMENT



improvement in legally occupied land is planned to be supervised by the proposed Fourth Division ADU. This would have its headquarters and a training centre at Kabuloh, and 14 ADU Centres would be established by 1980. A total of 255 specially trained personnel would be required by that time and it is estimated they would be working with about 3,540 farmers.

(b) Road Based Improvement in Legally Occupied Land

It is difficult to gauge the rate of response of the local people to extension by the ADU staff, but indications from work already undertaken in the Study Area suggest it will be rapid. For planning purposes assumptions have been made, which are explained in Volume II, Chapter 3, concerning the rate of development and cropping patterns. Based on these assumptions the estimated acreages of crops planted on road based improvement schemes by 1980 are as follows:

	<i>Crops</i>					<i>Net Planted Acres</i>
Oil Palms	7,360
Rubber	19,125
Cocoa	2,945
Rice	2,630
Other crops as small-scale enterprises	4,355
Total	36,415

(c) Private Development of State Land

About 55,000 gross acres of State Land would have been allocated to private enterprise by 1980. The estimated total net acres planted-up by then is as follows:

	<i>Crops</i>					<i>Net Planted Acres</i>
Oil Palm	24,110
Rubber	6,100
Cocoa	2,190
Rice and other crops	710
Pasture for beef	1,500
Total	34,610

Crop processing facilities by 1980 would amount to:

- one new oil palm mill in Igang, in addition to the existing SOP mill near Kabuloh and the already planned SLDB mill near Ladang Tiga;
- about 45 Samoan-type cocoa driers each serving 40 to 50 acres of crop;
- a crumb rubber factory planned by Government established near Bintulu, and possibly another at Marudi.

The total investment required for this development is estimated to be \$125 mn. Production value would rise to \$47.8 mn per year by 1980, an increase of 173 per cent over the figure for 1970.

3.3.2 Forestry

Three types of forest harvesting are planned to be extensively used in the Study Area. The types are:

- (a) Salvage logging which is the removal of all useable and marketable timber from areas previously logged now destined for agricultural development.

- (b) Logging without silvicultural control which is the removal of all useable and marketable timber from virgin forest areas destined for agricultural development.
- (c) Logging with silvicultural control which is the harvesting of forest areas with the object of their remaining permanently under forest under a sustained yield regime.

The acreages which will have been harvested under each type of logging by 1980 are shown in Table 3.4 in which the FAO Units are separated out since they have been studied and evaluated in considerably greater detail than the remaining areas. Each of the three Units will have its own large sawmill and other processing and remanufacturing units. A fourth sawmill will exist in Long Lama, based on FAO Unit 7 which is outside the Study Area boundaries. The estimated total investments in these timber industry complexes by 1980 is \$50 mn, and the total expected throughput of the mills about 19 million cubic feet per year. Remanufacturing of wood products is planned both inside and outside these industrial complexes. (These plans are included in the manufacturing sector and discussed in Section 3.3.4). Production value in the sector would rise to \$114.1 mn per year by 1980, 77 per cent above the 1970 figure, and employment would be 5,500, 38 per cent up on 1970.

3.3.3 Supporting Government Development Activities and Agencies

Emphasis has been given in Volume II, Chapters 3 and 4 to the importance, for orderly implementation of the agricultural and forestry development plans, of the identification and demarcation of boundaries between different categories of land; both physical categories and ownership categories. These activities will need to have been carried out by different Government agencies.

By 1980 administrative officers should have negotiated with existing cultivators in some 20 different areas to determine the boundaries between legal and illegal occupation. Soil surveyors and land classifiers should have carried out semi-detailed soil surveys on about 235,000 acres to determine the suitability and capability of the land for development. Field teams of the Land and Survey Department and the Forest Department should have surveyed and demarcated some 700 miles of boundaries.

3.3.4 Manufacturing

Detailed planning of development of the manufacturing industry sector in the Study Area has not been within the Scope of Work of the Study, but selected industries have been dealt with as examples of possible development. The industries identified for establishment within the AP-period are based mainly on local raw materials. The most important, from an investment point of view, is the Sarawak LNG-plant expected to be built at Tanjung Kidurong near Bintulu. From an employment viewpoint, however, the wood-based industries are more important.

(a) Bintulu LNG-plant

The expected total capital expenditure will be about \$1,100 million by 1978. The plant will be very large, with an ultimate capacity of 600 to 700 million cubic feet of liquified gas per day. During its construction period the project will

TABLE 3.4 PLANNED FOREST HARVESTING IN THE ACTION PROGRAMME PERIOD (acres)

Type of Logging	Mixed Dipterocarp Forests*					Forest Reserves Outside	Peat Swamp Forests	Total
	FAO Unit 1	FAO Unit 2	FAO Unit 3	Forest Reserves not FAO	Forest Reserves			
Controlled logging for sustained yield	6,200	4,200	—	6,100	—	—	30,000	46,500
Uncontrolled logging	19,800	15,700	21,700	16,700	—	—	—	73,900
Salvage logging	—	—	—	—	110,900	—	—	110,900
Total	26,000	19,900	21,700	22,800	110,900	—	30,000	231,300

* Excludes area serving fourth timber complex (FAO Unit 7) at Long Lama.

employ more than 3,000 workers and when in operation the plant will offer continuous employment to 350 to 400 people. Construction is expected to be undertaken by Sarawak Shell Berhad in co-operation with the Government.

(b) Wood-based Industries

Four industrial complexes will be established based primarily on the harvesting of the FAO Units. Final planning of them is being carried out by private investors in co-operation with the Sarawak Timber Industry Development Corporation (STIDC); consequently estimates of investment and output are as yet only provisional. The Action Programme envisages that in addition at least one unit of each of the following should be established by 1980 based largely on existing medium-size logging licence areas:

Furniture factory

Particle board plant

Moulding plant

Parquet factory

Plywood factory

Prefabricated housing plant

Impregnating plant

It is possible that more than one unit of each kind could be established before 1980. For example, at least two plywood mills are at present under negotiation.

(c) Other Industries

The Action Programme envisages construction of a glass container factory based on local raw materials, a bottling plant and an iron foundry. Also anticipated is a general development of small-scale industry and the creation of three new industrial estates, two in Miri and one in Bintulu.

Total investment from 1975 to 1980, excluding the LNG-plant, is expected to be \$75 mn. Production value would rise to \$46.8 mn. per year by 1980, 223 per cent higher than in 1970, and employment would rise to 8,500, or 89 per cent higher than in 1970.

3.3.5 Infrastructural Development

(a) Public Utilities and Savings

Nine new agricultural villages and one Sub-regional Centre (Igang) are planned to be started during the AP-period. In addition to the public services and utilities associated specifically with these villages, there should be a substantial increase and improvement in public services throughout the Region, as shown in Table 3.5.

The locations of the nine villages are shown on the Action Programme Map. they have been named for convenience as follows: Ladang Empat, Sepupok, Subis, Mera-a, Galasah, Sebanah, Lamaus, Ensabang, Telabit.

Water supply and sewerage will also have increased significantly. It is proposed that all new agricultural villages and towns should be supplied with treated water and adequate sewerage systems. These facilities are planned for introduction in the early years of town development, while electricity and telecommunications will be supplied gradually and at a later stage. Consequently, some of the nine villages mentioned will not get the latter amenities during the AP-period but all new villages will have been supplied with cleansing and refuse disposal facilities before 1980.

TABLE 3.5 PUBLIC SERVICE IMPROVEMENTS IN THE REGION UP TO 1980

Description	Number
Primary and secondary school streams	40
Kindergartens	6
Vocational schools	2
Junior college	1
General hospitals	2
Community health centres	3
Post offices	5
New postal agencies	14
New police stations	7
Sub-district offices, and new Government complexes	3
New Government complexes in Miri and Bintulu ...	2 (one in each)
New community halls	12
New religious buildings	16

(b) Housing

The growth in population and the development in the rural and urban areas will require an expanded housing industry based on traditional construction principles and rationalised prefabrication of houses. The requirements for houses will include low-cost prefabrication as well as more expensive houses. It is assumed that existing contractors will build the latter.

The total requirements for houses during the AP-period is estimated as follows:

Low-cost houses	5,100
Other types	3,400
Total:	8,500

A detailed phasing of the housing projects is given in Annexure II.

(c) Transport

The road construction programme proposed for completion during the AP-period is summarised below and dealt with in greater detail in Volume II, Chapter 7. The work would require between 9 and 11 PWD Construction Units. In addition to this road programme, plans are under consideration for the construction of a deep-water port near Bintulu and modern coastal traffic ports at Miri and Marudi. The airport at Miri is presently being expanded to serve medium-size jet aircraft.

Road Construction Programme

<i>Description</i>	<i>Miles</i>
New trunk roads	48
Public secondary roads and feeder roads	124
New urban roads	76
Improvements and surfacing on existing roads	130 including improvements to 11 bridges

(d) Private Services

The establishment of new villages and centres and the expansion of existing ones will require the construction of new shophouses, offices and storage facilities. The total number of trading and service units to be constructed in the AP-period has been estimated as:

	<i>Numbers</i>
Retail and wholesale	550
Special services	55
Other services	125
Total:	730

A detailed phasing of the private services projects is given in Annexure II.

3.4 BUILD-UP OF DEVELOPMENT IN THE ACTION PROGRAMME PERIOD

3.4.1 Agriculture

(a) Public Development of State Land

This represents the areas planned in detail, all of which are located in the Lambir-Subis and Niah-Suai RDAs. The land blocks concerned are shown on the Action Programme Map and in Figure 3.1. For convenience the blocks have been named: Mera-a, Karabungan, Igang, Galasah, Sebanah, Sawai, Lamaus, Ensabang, Jatan and Telabit.

In Annexure I complete details of this development are presented as two Investible Projects:

- (i) Public Development of State Land for Estate and Smallholder Schemes.
- (ii) Establishment of a Foundation Herd of Beef Cattle.

The phasing of land clearing of areas to be further developed by SLDB is given in Table 3.6 which is deliberately extended beyond the AP-period to emphasise that the development up to 1980 is only part of a continuing plan.

The SLDB clearing programme in the Karabungan land block for the NLC beef ranch and the Department of Agriculture's Livestock Production and Animal Husbandry Training Centre is as follows:

<i>Year</i>	<i>Estimated Gross Acres Cleared</i>
1974	1,000
1975	2,450
1976	2,500
1977	1,000
1978	500

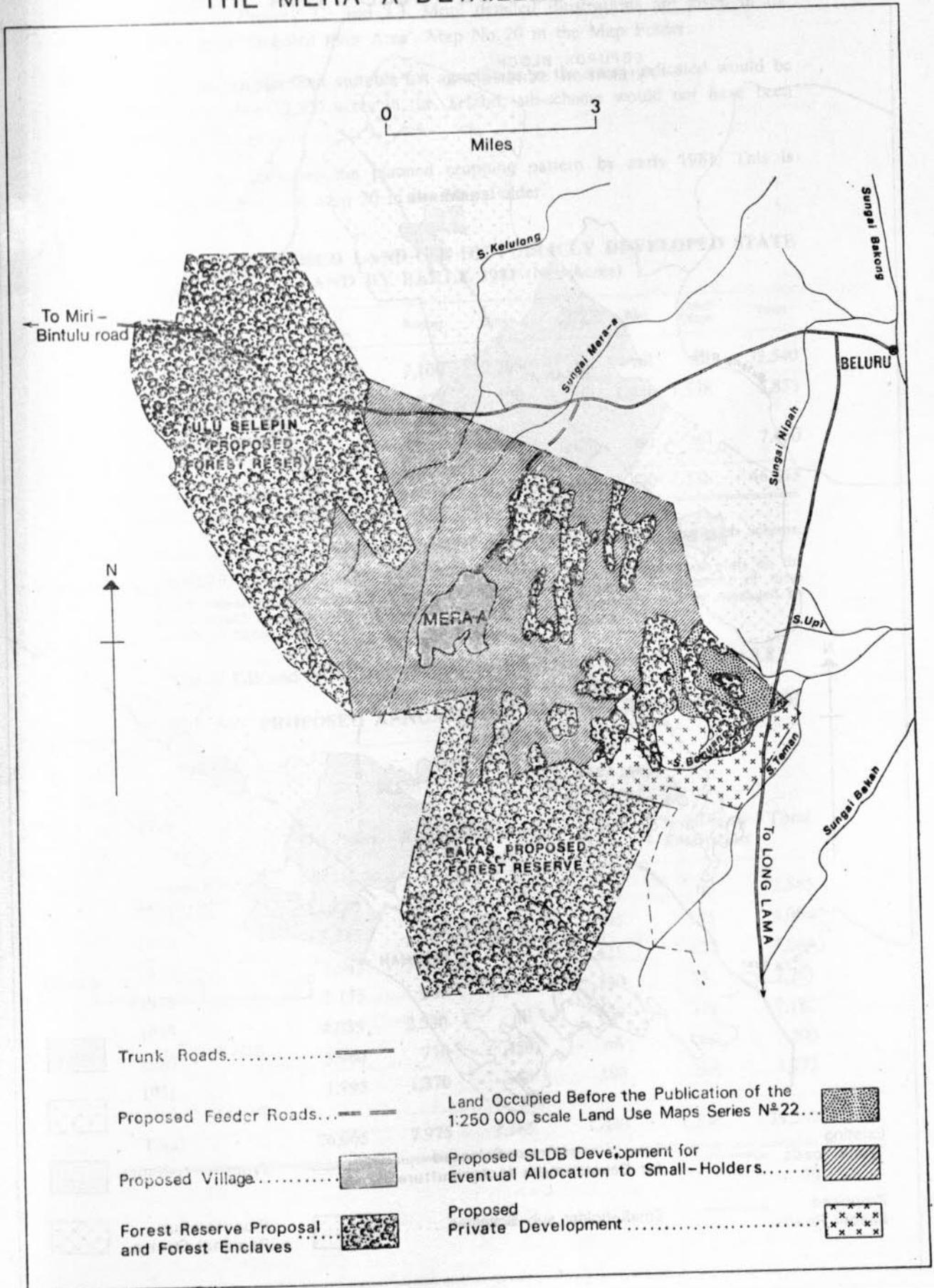
TABLE 3.6 PHASING OF SLDB LAND CLEARING⁽¹⁾

Year	Land Block	GROSS ACRES			Remarks
		Village	Agricultural	Total	
1974/75	Mera-a	285	3,420	3,705	Whole crop area + village site.
1975/76	Igang	580	4,015	4,595	Whole crop area + village site.
1976/77	Galasah	245	2,810	3,055	Whole crop area + village site.
	Sebanah	400	4,590	4,990	Whole crop area + village site.
1977/78	Sawai	—	3,930	3,930	Whole crop area (no village site).
	Lamaus	500	3,770	4,270	Village and whole crop area except the rubber and 605 gross acres of oil palm.
1978/79	Lamaus	—	2,005	2,005	All the rubber + 510 acres of oil palm.
	Ensabang	500	5,625	6,125	Whole crop area + village site.
1979/80	Jatan	—	7,265	7,265	Whole crop area (no village site).
	Telabit	—	735	735	Oil palm.
1980/81	Telabit	400	3,895	4,295	Remaining crop area + village site.
	Kabatu	—	(2)	3,705	Details to be planned following semi-detailed soil survey.
1981/82	Kabatu	—	(2)	10,000	Details to be planned following semi-detailed soil survey.
1982/83	Kabatu	—	(2)	7,800	Details to be planned following semi-detailed soil survey.

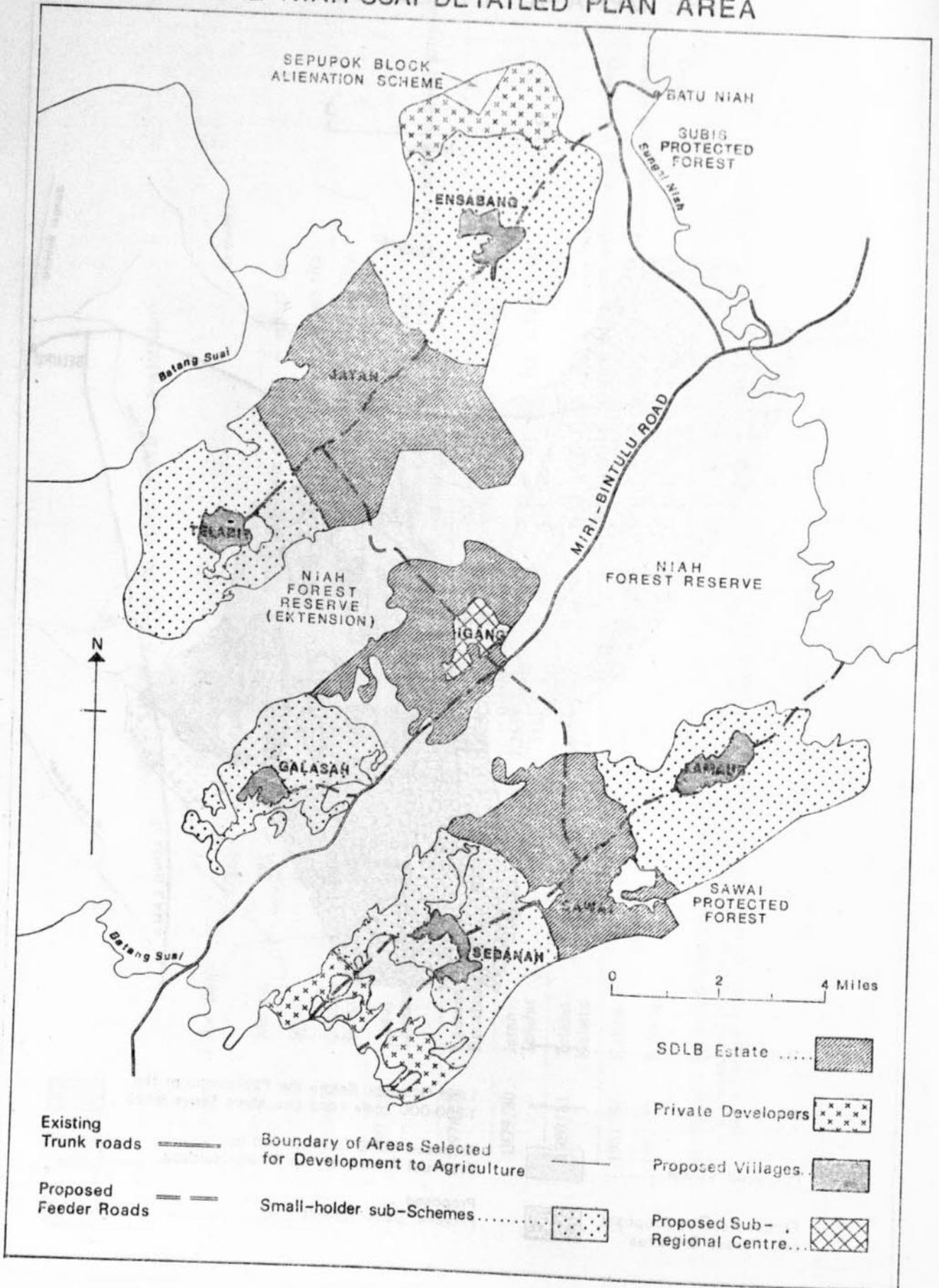
(1) This does not include land clearing for the beef ranch.

(2) A minimum total of 6,430 gross acres must be allocated to oil palm in Kabatu during the three years 1981, 1982 and 1983 to give 3,935 net acres of oil palm to make a total of 30,000 net acres required for a 60 ton per hour factory in the Niah-Suai Rural Development Area.

ORGANISATION OF DEVELOPMENT IN THE MERA-A DETAILED PLAN AREA



ORGANISATION OF DEVELOPMENT IN THE NIAH-SUAI DETAILED PLAN AREA



The division of land for the new SLDB estate and the smallholder sub-schemes are shown in Figures 3.2 and 3.3. More detailed illustrations are given in the 1:50,000 scale 'Detailed Plan Area', Map No. 20 in the Map Folder.

By 1980 all the land suitable for agriculture in the areas indicated would be cleared, but about 3,500 acres in the Telabit sub-scheme would not have been planted.

Table 3.7 indicates the planned cropping pattern by early 1981. This is illustrated in detail on Map 20 in the Map Folder.

TABLE 3.7 PROPOSED LAND-USE ON PUBLICLY DEVELOPED STATE LAND BY EARLY 1981 (Net Acres)

	Oil Palms	Rubber	Cocoa	Pasture for Beef	Rice	Other Crops	Total
SLDB Control	24,175	7,100	2,265 ⁽¹⁾	nil	nil	nil	33,540
Smallholder Control ⁽²⁾	1,890	875	120	nil	1,430	1,538	5,853
NLC and Department of Agriculture	nil	nil	nil	7,450	nil	nil	7,450
Total:	26,065	7,975	2,385	7,450	1,430	1,538	46,843

(1) Does not include 500 acres planned by SLDB to be planted on their existing Subis Scheme.

(2) Consists of all crops on Mera-a Sub-Scheme, but only rice and homestead plots on the other sub-schemes destined for sub-division into smallholdings. Management of these crops would be guided by ADU while all permanent crops would still be managed by SLDB as public estates.

The SLDB and ADU crop planting programmes are shown in Table 3.8.

TABLE 3.8 PROPOSED ANNUAL CROP PLANTATION PROGRAMME

Year	Net Acres Planted						Total
	SLDB			ADU			
	Oil Palm	Rubber	Cocoa	Rice	Small-scale Enterprises		
1975	1,890	875	120	nil	nil		2,885
1976	3,245	370	nil	195	195		4,004
1977	3,945	1,415	875	425	427		7,087
1978	5,175	645	780	330	331		7,261
1979	4,035	2,530	nil	300	318		7,183
1980	5,980	770	450	nil	nil		7,200
1981	1,795	1,370	160	180	268		3,773
Total	26,065	7,975	2,385	1,430	1,538		39,393

The estimated build-up of crop production from these developments is given in Table 3.9. The quantities have been calculated on yield projections given in Supporting Report 2, Part IV.

TABLE 3.9 SUMMARY OF CROP PRODUCTION FROM DETAILED PLANNED PUBLICLY DEVELOPED SCHEMES (Tons)

Year	Palm Oil	Palm Kernel	Rubber drc	Cocoa dbe	Rice
1975	—	—	—	—	—
1976	—	—	—	—	—
1977	—	—	—	—	—
1978	189	38	—	—	152
1979	1,685	311	—	26	174
1980	5,037	935	—	54	875
1981	10,227	1,949	—	273	1,222
1982	17,151	3,309	245	646	1,383
1983	24,732	4,822	497	1,018	1,630
1984	33,194	6,502	1,053	1,288	1,698
1985	39,781	7,848	1,576	1,427	1,730
1986	43,706	8,718	2,610	1,563	1,759
1987	45,648	9,133	3,476	1,598	1,759
1988	46,352	9,268	4,429	1,598	1,759
1989	46,480	9,294	5,060	1,598	1,759
1990	46,202	9,240	5,477	1,598	1,759
1991	45,719	9,130	5,793	1,598	1,759
1992	45,066	9,006	6,031	1,598	1,759
1993	44,347	8,847	6,226	1,598	1,759
1994	43,500	8,666	6,325	1,598	1,759
1995	42,756	8,536	6,380	1,598	1,759
1996	41,998	8,385	6,380	1,598	1,759
1997	41,373	8,275	6,380	1,598	1,759
1998	40,820	8,156	6,380	1,598	1,759
1999	40,341	8,046	6,380	1,598	1,759

drc = dry rubber content.
dbe = dry bean equivalent

For the beef ranch the build-up and sales of animals during the first six years of the project are shown in Table 3.10, but full production is not expected until about year ten after commencement of cattle importation (see Supporting Report 2, Part V). At that time the expected animal sales could be:

1,000 breeding females;

4,000 steers for slaughter, though some male stock could be selected as breeding bulls;

500 culled cows and bulls for slaughter.

TABLE 3.10 ESTIMATED HERD BUILD-UP AND ANIMAL SALES ON THE BEEF CATTLE RANCH STARTED DURING ACTION PROGRAMME PERIOD

Year Commencing with Importation of Cattle	Breeding Herd		Sales		
	Cows	Bulls	Steers or Bulls	Cull Cows	Cull Bulls
1	580	40	nil	nil	nil
2	1,140	75	nil	55	nil
3	1,630	110	200	160	15
4	2,250	140	590	185	20
5	2,265	180	540	285	25
6	2,915	210	1,375	350	30

(b) Road Based Improvement in Legally Occupied Land

This activity, as explained earlier, will be undertaken by the ADU as part of its overall task of guiding and supporting small-scale farming in the intensive development areas.

The phase establishment of the ADU Centres is given in Table 3.11 which also indicates the main purpose for establishing the Centre. Some of the Centres established for supporting smallholders on SLDB developed land would also be able to extend their activity into nearby legally occupied land.

TABLE 3.11 ESTABLISHMENT OF ADU CENTRES

ADU Centre Formed at	Main Purpose of Centre	Year Formed
Bukit Peninjau	Road based improvement	1975
Batu Niah	Block alienation scheme and Road based improvement	1975
Bekenu	Road based improvement	1976
Mera-a	Support of smallholders	1976
Bintulu 10th mile	Road based improvement	1976
Meluru	Road based improvement	1976
Marudi	Road based improvement	1976
Long Lama	Road based improvement	1977
Labang	Road based improvement	1977
Galasah	Support of smallholders	1978
Sebanah	Support of smallholders	1978
Tubau	Road based improvement	1978
Lamaus	Support of smallholders	1980
Ensabang	Support of smallholders	1980

Those Centres associated with road based development are aimed, up to 1980, at starting schemes along existing and proposed roads wherever the roads pass through presently occupied land. This is shown on the Action Programme Map and Figure 3.1. The estimated annual acreages cleared for crops and the number of farmers involved in these operations to 1980 are given in Table 3.12.

The estimated production from the crops planted on road based improvement schemes started by mid-1981 is given in Table 3.13.

A detailed description and economic analysis of the road based improvement schemes are given in Supporting Report 2, Part II, and in Annexure I, where the whole development is presented as an investible project.

TABLE 3.12 ESTIMATED NUMBER OF FARMERS HANDLED AND ACREAGES OF CROP LAND CLEARED ON ROAD BASED IMPROVEMENT AND ONGOING BLOCK ALIENATION SCHEMES* UP TO 1980

Year	Cumulative Total Number of Farmers Handled	Estimated Net Acres of Crops per Year				
		Oil Palms	Rubber	Cocoa	Rice	Other Crops
1976	150	850	990	190	150	230
1977	510	1,200	3,110	470	410	670
1978	945	1,280	3,900	550	520	850
1979	1,390	1,250	3,995	615	545	955
1980	1,845	1,060	3,415	515	475	825
to mid- 1981	2,269	1,720	3,715	605	530	825
Totals:	2,269	7,360	19,125	2,945	2,630	4,355
					Grand total	36,415

* 3,000 acres of land allocated to about 210 farmers at Sepupok under supervision of the Department of Agriculture.

TABLE 3.13 CROP PRODUCTION ON ROAD BASED IMPROVEMENT SCHEMES (Tons)

Year	Oil Palm			Rubber drc	Cocoa dbe	Rice Padi
	ffb	Palm Oil	Kernels			
1976	—	—	—	—	—	—
1977	—	—	—	—	—	118
1978	340	68	10	—	—	454
1979	3,116	623	107	—	36	932
1980	8,654	1,731	318	—	162	1,512
1981	16,320	3,264	639	—	400	2,164
1982	25,169	5,034	1,005	238	715	2,828
1983	35,278	7,056	1,403	1,122	1,062	3,574
1984	47,106	9,421	1,873	2,592	1,411	3,832
1985	60,730	12,146	2,425	4,469	1,786	4,031
1986	69,754	13,951	2,789	6,575	2,042	4,134
1987	74,788	14,958	2,991	8,785	2,186	4,134
1988	76,851	15,370	3,074	11,228	2,186	4,134
1989	77,505	15,501	3,100	12,838	2,186	4,134
1990	77,411	15,482	3,096	14,005	2,186	4,134
1991	76,675	15,335	3,067	14,808	2,186	4,134
1992	75,769	15,154	3,031	15,362	2,186	4,134
1993	74,514	14,903	2,981	15,797	2,186	4,134
1994	73,198	14,640	2,928	16,076	2,186	4,134
1995	71,892	14,378	2,876	16,244	2,186	4,134
1996	70,863	14,378	2,876	16,244	2,186	4,134
1997	69,905	14,378	2,876	16,244	2,186	4,134
1998	68,954	14,378	2,876	16,244	2,186	4,134

ffb = fresh fruit bunches.
drc = dry rubber content.
dbe = dry bean equivalent.

(c) **Private Development of State Land**

It is proposed to allocate about 55,000 gross acres of State Land to private enterprise by 1980. The proposed phasing of allocation and recommended type of farms are given in Table 3.14. The location of the land blocks concerned are shown on the Action Programme Map and Figure 3.1.

TABLE 3.14 PROPOSED RATE OF ALLOCATION OF LAND FOR PRIVATE DEVELOPMENT SHOWING THE TYPE OF FARMS RECOMMENDED AND THE ESTIMATED ACREAGES OF LAND INVOLVED

<i>Allocation Scheduled for Year</i>	<i>Land Block Concerned</i>	<i>Type of Farm Recommended</i>	<i>Estimated Area of Agricultural Land (acres)</i>	<i>Remarks</i>
1976	Mera-a Ulu Mamat Menantan	Small*	560	Oil palm the main crop.
		Small	1,980	Oil palm the main crop.
		Medium†	4,500	Part of land is disputed by two local groups of people. Much land is expected to be suitable for beef cattle, the remainder recommended mainly for oil palm.
	Ulu Klad Sibiu	Medium Experimental	1,800 2,300	Oil palm the main crop. Agricultural University farm.
Total 1976			11,140	
1977	Ulu Masiat Majam	Medium	3,400	Oil palm the main crop.
		Medium	4,200	Oil palm the main crop.
Total 1977			7,600	
1978	Sg. Klad Karabungan	Large‡	12,600	Oil palm the main crop.
		Small & Medium	8,600	The main proportion to beef cattle.
Total 1978			21,200	
1979	Sebanah Beseduan	Small	1,100	Oil palm the main crop.
		Large	11,800	Rubber probably the main crop.
Total 1979			12,900	
1980	Lebus western part of Beseduan	Medium	2,300	Rubber probably the main crop.
	Total:		55,140	

* Up to 50 acres.

† Several hundred acres using employed labour.

‡ Estate size operation.

The pattern and speed of development are less easily predicted for land allocated to private enterprise than for land planned to be developed by the public sector. However, using certain assumptions, given in Volume II, Chapter 3, estimates of enterprise build-up and production can be made. Table 3.15 presents the estimated net acres planted up each year.

TABLE 3.15 ESTIMATED ACREAGE OF CROPS PLANTED EACH YEAR BY PRIVATE ENTERPRISE IN THE INTENSIVE DEVELOPMENT AREAS DURING THE ACTION PROGRAMME PERIOD (Net Acres)

Year	Oil Palm	Rubber	Cocoa	Rice and Other Crops	Pasture for Beef
up to 1976	10,000*	nil	nil	nil	nil
1977	1,360	390	120	70	nil
1978	3,150	900	290	160	nil
1979	5,350	1,530	500	270	500
1980	4,250	3,280	1,280	210	1,000
Totals (1977-80)	14,110	6,100	2,190	710	1,500

* This acreage is already planted by SOP.

The estimated production build-up from private development started during the AP-period is given in Table 3.16.

(d) Overall Physical Development and Production

The total area of crops and pastures established under schemes started during the Action Programme would be 144,000 net acres. In Table 3.17 the overall cropping pattern and its phasing is summarised.

At the expected average yields and processing recovery rates given in Supporting Report 2, Part II, the estimated overall production from these areas is shown in Table 3.18. The table shows that:

- oil palm production in terms of palm oil and kernels would reach a peak in 1988 to 1989 when about 97,000 and 19,000 tons respectively would be produced;
- rubber output would commence in 1981 and reach a peak of 35,000 tons per annum in 1995;

TABLE 3.16 ESTIMATED PRODUCTION GENERATED BY PRIVATE INVESTOR DEVELOPMENT STARTED DURING THE AP-PERIOD

Production in Years (tons for crops, head for beef)

	Palm Oil	Palm Kernels	Rubber	Cocoa	Rice	Cull Cows and Bulls	Steers and Heifers	Total Cattle
1978	nil	nil	nil	nil				
1979	136	20	nil	nil	54	28	nil	188
1980	1,295	222	nil	nil	186	88	100	28
1981	4,463	810	nil	27	429	102	296	398
1982	10,215	1,951	nil	119	665	225	270	495
1983	16,995	3,338	109	324	859	406	1,148	1,554
1984	23,209	4,634	426	783	1,060	471	1,568	2,039
1985	28,568	5,710	1,050	1,479	1,136	623	1,844	2,467
1986	31,956	6,387	2,354	2,368	1,189	716	3,426	4,142
1987	33,894	6,779	4,084	3,226	1,212	801	3,276	4,077
1988	34,774	6,955	6,112	3,789	1,215	922	4,142	5,064
1989	35,040	7,008	8,141	4,046	1,216	946	4,222	5,168
1990	34,964	6,993	9,463	4,051	1,216	975	4,216	5,191
1991	34,639	6,928	10,381	4,051		1,149	4,302	5,451
1992	34,188	6,836	11,065			1,149	4,302	5,451
1993	33,650	6,730	11,605					
1994	33,077	6,491	12,016					
1995	32,456	6,491	12,286					
1996	32,456	6,491	12,286					
1997								
1998								
1999								
2000								

TABLE 3.17 OVERALL SUMMARY OF AREAS DEVELOPED UNDER SCHEMES INITIATED DURING THE ACTION PROGRAMME (Cumulative Net Acres)

Item	1975	1976	1977	1978	1979	1980	1981	1982	1983 onwards
CROPS									
Oil Palm ...	1,890	5,985	12,495	22,095	32,730	44,020	49,995	55,715	55,915
Rubber ...	875	2,235	7,150	12,595	20,650	28,115	36,515	44,645	47,365
Cocoa ...	120	310	1,775	3,395	4,510	6,755	8,865	11,120	12,275
Rice ...	—	345	1,180	2,030	2,875	3,350	4,060	5,760	5,780
Other crops/and some rice ...	—	425	1,590	2,930	4,475	5,510	6,725	6,985	6,985
Beef Ranching ...	3,250	5,500	5,950	6,200	6,700	7,700	8,925	11,000	14,825
Overall total acreage ...	6,135	14,800	30,140	49,245	71,940	95,450	115,085	135,225	143,145
ORGANISATION									
SLDB Estate and Smallholder Schemes ...	2,885	6,890	13,980	21,235	28,420	35,620	39,395	39,395	39,395
NLC Ranch and Beef Training ...	3,250	5,500	5,950	6,200	6,200	6,200	6,200	6,200	6,200
Road based Improvement Schemes ...	—	2,410	8,270	15,370	22,730	29,020	36,415	46,760	46,760
Private Investor Schemes ...	—	—	1,940	6,440	14,590	24,610	33,075	42,870	50,790

- cocoa plantations would reach full production of 7,800 tons per annum by 1988;
- rice output from smallholder and road based improvement schemes would reach 7,100 tons of padi by 1986;
- beef cattle for slaughter or for breeding purposes turned out by the various schemes proposed, would amount to 9,900 head per annum by 1990 and this level of outturn could be maintained thereafter.

(e) Economic and Financial Aspects

Analysis of the agricultural components of the Action Programme were carried out to assess their financial viability and to evaluate their contribution to the regional economy. The economic life of the agricultural projects has been taken as 25 years; after which time replanting in the case of the major tree crops was assumed to be necessary. Both market price and social price analyses were undertaken.

The market price evaluation examines the schemes from an investor's point of view, whether this be the Government, SLDB or a private commercial concern. For this analysis all costs and revenues were calculated at actual market values.

The social evaluation of the schemes measures the returns to factors of production where market imperfections and internal transfer payments have been eliminated. Inputs and outputs are valued, where possible, at their opportunity costs, the object being to measure the social economic returns to the schemes.

The components of the whole Plan which were analysed were:

- public sector settlement schemes cover SLDB activities connected with public estates and smallholder schemes, and the NLC beef ranch;
- road based improvement schemes;
- private investors development schemes.

For each scheme the net value of production has been calculated from the gross value less initial development costs (including housing), production costs (materials and labour), processing and management costs and an element for replanting at the end of the 25-year cycle.

(i) Public Sector Settlement Schemes

The net cash flows are shown in Figure 3.4. At market prices it is shown that the investment period (i.e. when costs exceed revenues) would extend over nine years (up to 1982). The accumulated cash flow deficits by that time would amount to \$56.3 mn. The annual cash surplus would rise to \$11.2 mn in 1990 and 1991 but would decline to \$9.6 mn by 1998 due to decreasing oil palm yields and prices toward the end of the Plan period.

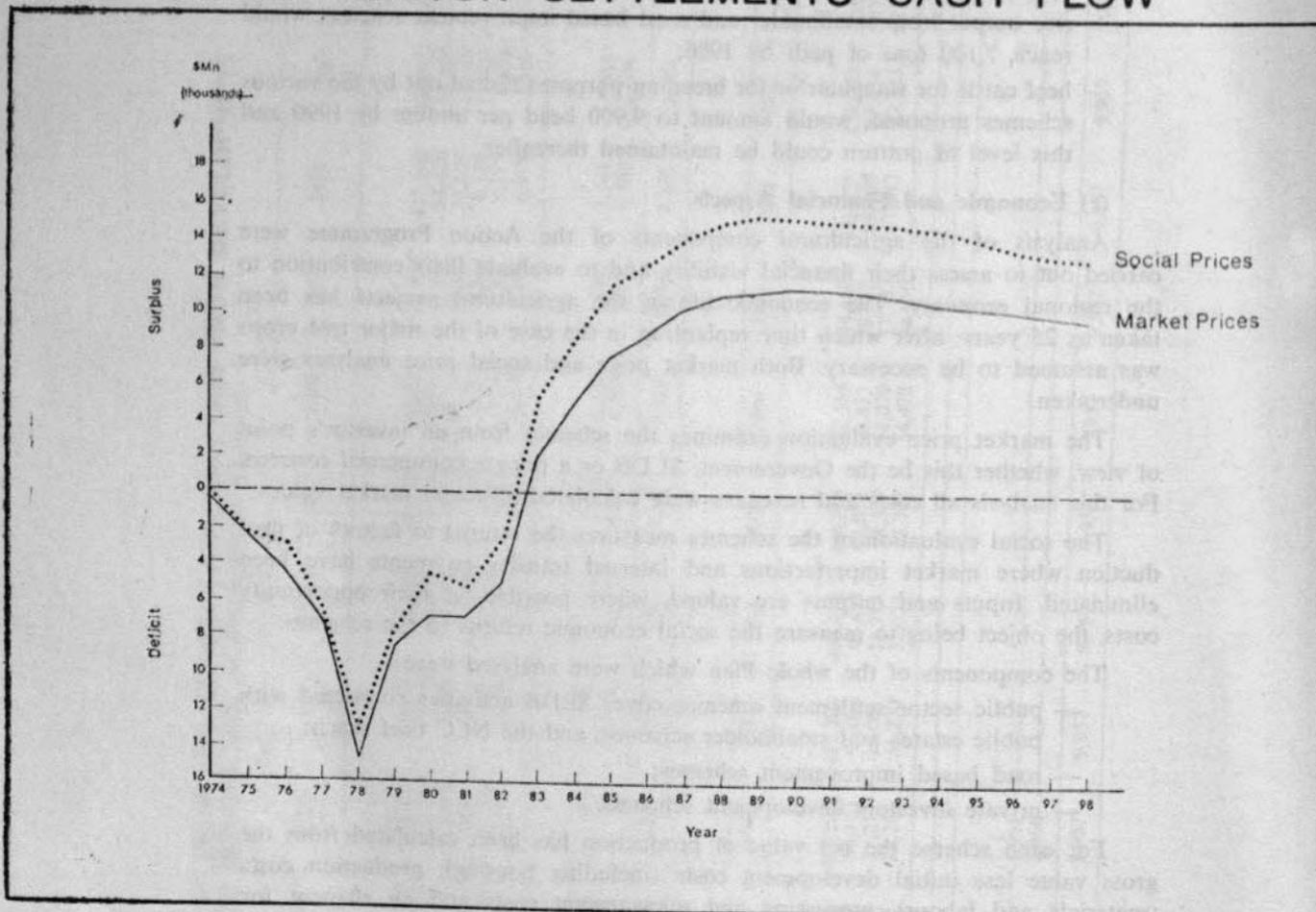
The commercial rate of return to investment in the proposed development at basic prices (the base level of prices from which sensitivity analyses are made) would be 8.5 per cent; while if rubber and palm oil prices rise 20 per cent a return of 13.2 per cent would be achieved.

This range, reflecting the real return discounting inflationary factors, can be regarded as a satisfactory basis for investment.

In the analysis at social price, labour was costed at a shadow wage of \$3 per man-day to reflect the low level of productivity in traditional agricultural employment. In this case the internal rate of return (IRR) would be 14.6 per cent at basic prices and at the 20 per cent higher price it would amount to 18.5 per cent.

PUBLIC SECTOR SETTLEMENTS CASH FLOW

FIGURE 3-4



The Net Present Values (NPV) of the development over the 25 years at discount rates of seven and ten per cent would be as follows:

	IRR %	NPV over 25 years \$ mn	
		7%	10%
Basic Prices, labour \$3	14.6	36.9	16.1
Basic prices, labour \$5	11.2	20.5	4.1
Rubber price raised 20 per cent, labour \$3	15.2	42.4	19.6
Rubber and palm oil prices raised 20 per cent, labour \$3	18.5	64.2	34.6

(ii) Road Based Improvement Schemes

The road based agricultural improvement is planned in seven of the nine RDAs during the period 1975 to 1981.

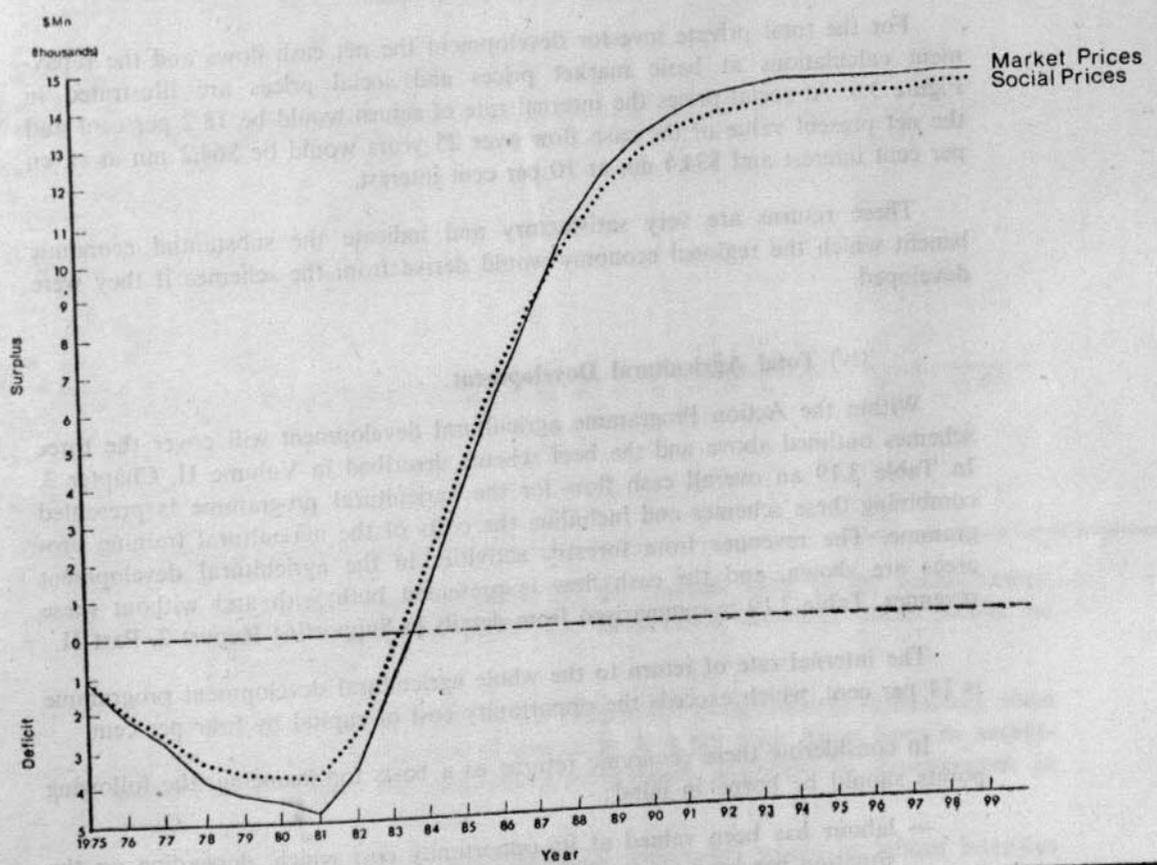
In addition to the costs of developing these areas (land clearing, planting and production cost), there are the expenses of establishing and managing the

ADU. For the purpose of analysis two-thirds of the total costs of the ADU were allocated to the road based improvement schemes.

The net cash flows at market and social prices are shown in Figure 3.5. At basic market prices the investment period of the scheme (the period during which costs exceed revenue) would be nine years and the accumulated annual deficits would amount to \$28.4 mn by 1983. The annual cash surplus would rise to a peak of \$14.4 mn in 1999. The commercial rate of return would be 15.9 per cent which is very satisfactory for an investment with interest payable at seven to eight per cent. The internal rate of return would in this case be 17.7 per cent and the NPV \$37.7 mn at seven per cent discount rate and \$19.1 mn at 10 per cent when calculated over 25 years.

FIGURE 3-5

ROAD BASED IMPROVEMENT SCHEMES CASH FLOW



(iii) Private Development Schemes

Private investor development is proposed in four RDAs. The economic feasibility was examined for two different units and for the whole private investor development in order to assess its financial viability and the overall capital requirements. The two units analysed were:

- a large-scale estate (3,500 acres) with oil palm, rubber and cocoa;
- a medium-scale estate (600 acres) based on rubber and cocoa.

For the large-scale estate the commercial rate of return would be 10.6 per cent at basic prices and 16 per cent at higher rubber and palm oil prices. Capital investment required for this estate would be \$6.9 mn and the payback period would be 16 years including interest at seven per cent. These achievements are comparable with those of the public sector settlement schemes.

For the medium-scale estate two-thirds of the 600 cropped acres were assumed to be under rubber and the balance under cocoa; a situation which appears probable in the identified agricultural development areas in the Limbang-Tubau RDA.

The commercial rate of return achieved would be 10.5 per cent and the payback period would be 18 years with interest at seven per cent. Capital invested would be \$1.03 mn over six years and including funded interest would amount to about \$1.5 mn in the eighth year investment period.

For the total private investor development the net cash flows and the repayment calculations at basic market prices and social prices are illustrated in Figure 3.6. At social prices the internal rate of return would be 18.2 per cent and the net present value of the cash flow over 25 years would be \$64.2 mn at seven per cent interest and \$34.4 mn at 10 per cent interest.

These returns are very satisfactory and indicate the substantial economic benefit which the regional economy would derive from the schemes if they were developed.

(iv) Total Agricultural Development

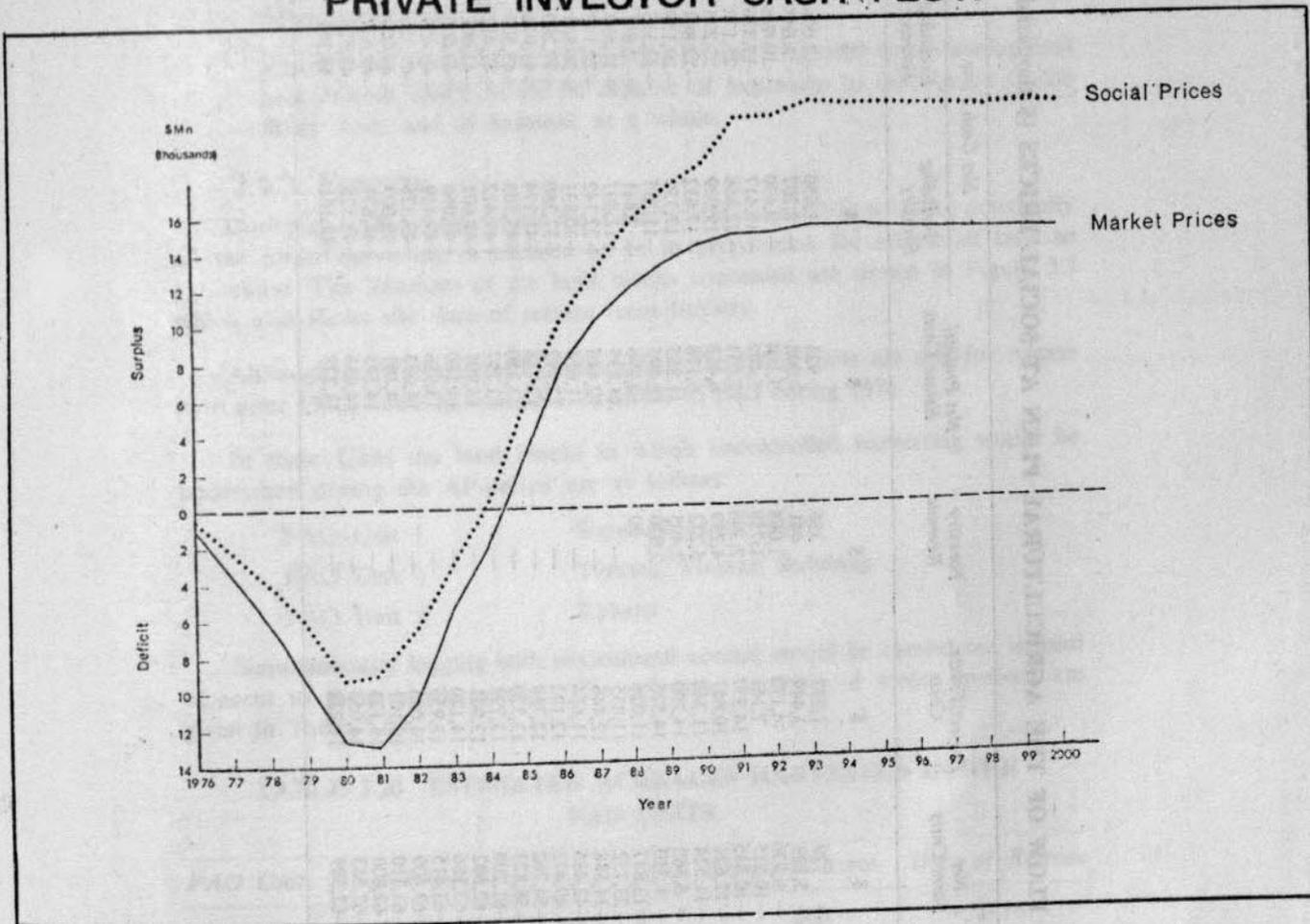
Within the Action Programme agricultural development will cover the three schemes outlined above and the beef scheme, described in Volume II, Chapter 3. In Table 3.19 an overall cash flow for the agricultural programme is presented combining these schemes and including the costs of the agricultural training programme. The revenues from forestry activities in the agricultural development areas are shown, and the cash flow is presented both with and without these revenues. Table 3.19 is summarised from details in Supporting Report 2, Part II.

The internal rate of return to the whole agricultural development programme is 14 per cent, which exceeds the opportunity cost of capital by four per cent.

In considering these economic returns as a basis for financing, the following points should be borne in mind:

- labour has been valued at its opportunity cost which, depending on the situation has been assumed at \$3 per man-day or the value of subsistence earnings displaced;
- all export duties have been excluded from the analysis and output has been valued at border parity or world prices. Generally the prices of major export commodities have been estimated on a conservative basis and higher returns may be achieved;
- no provision has been made for general infrastructure costs but all direct costs of roads, transport and housing required for the developments have been included in the analysis;

PRIVATE INVESTOR CASH FLOW



— no provision has been made for the residual value of the assets created by the investments under the programme although these would be considerable.

In overall terms the return to the programme is regarded as satisfactory since it exceeds the opportunity cost of capital by four per cent. Apart from its acceptable rate of return, the programme contributes positively to development in several other ways, as follows:

- a large proportion of the activities undertaken would be labour intensive and result in a substantial creation of employment opportunities;
- incomes generated in the agricultural sector would be well above current earnings in traditional subsistence agriculture and an equitable distribution of this new wealth would be assured by the labour to land ratio and the pattern of development organisations proposed;
- a substantial contribution to the net foreign exchange reserves of the country would be derived from the programme since in general the schemes would have a high direct export and a low direct import content;

TABLE 3.19 OVERALL SUMMARY CASH FLOW OF THE AGRICULTURAL PLAN AT SOCIAL PRICES (\$ thousand)

Year	Gross Revenue		Farm Costs		Net Farm Costs		Project/Estate Costs		Forestry Revenue		Net Project/Estate Costs		Net Cash Flow	
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	Including Forestry	Excluding Forestry
1974	729	...	729	1,277	356	921	1,650	...	921	1,650	...	2,006
1975	5,199	6,623	5,199	3,449	441	3,008	8,207	...	3,008	8,207	...	8,648
1976	...	97	6,623	10,611	6,526	4,172	1,068	3,104	9,630	...	3,104	9,630	...	10,698
1977	...	396	10,611	12,578	10,215	7,161	1,759	5,402	15,617	...	5,402	15,617	...	17,376
1978	...	1,743	12,578	16,773	10,835	14,337	2,306	12,031	22,866	...	12,031	22,866	...	25,172
1979	...	4,152	16,773	21,314	12,621	10,657	4,239	6,418	19,039	...	6,418	19,039	...	23,278
1980	...	9,790	21,314	11,524	11,340	11,340	5,222	6,118	17,632	...	6,118	17,632	...	22,864
1981	...	16,990	22,858	22,858	5,868	14,290	2,405	11,885	17,753	...	11,885	17,753	...	20,158
1982	...	26,552	25,342	25,342	1,210	14,525	2,030	12,495	11,285	...	12,495	11,285	...	13,315
1983	...	38,203	24,366	24,366	13,837	11,026	30	10,996	2,841	...	10,996	2,841	...	2,811
1984	...	48,818	25,086	25,086	23,732	11,835	---	11,835	11,897	...	11,835	11,897	...	11,897
1985	...	60,949	26,361	26,361	34,588	12,446	---	12,446	22,142	...	12,446	22,142	...	22,142
1986	...	70,236	27,751	27,751	42,485	11,654	---	11,654	30,831	...	11,654	30,831	...	30,831
1987	...	78,531	29,059	29,059	49,472	12,192	---	12,192	37,280	...	12,192	37,280	...	37,280
1988	...	85,210	30,448	30,448	54,762	12,788	---	12,788	41,974	...	12,788	41,974	...	41,974
1989	...	89,755	30,932	30,932	58,823	13,320	---	13,320	45,503	...	13,320	45,503	...	45,503
1990	...	92,811	31,602	31,602	61,209	13,797	---	13,797	47,412	...	13,797	47,412	...	47,412
1991	...	94,466	31,964	31,964	62,502	13,901	---	13,901	48,601	...	13,901	48,601	...	48,601
1992	...	95,419	32,233	32,233	63,186	14,120	---	14,120	49,066	...	14,120	49,066	...	49,066
1993	...	95,874	32,459	32,459	63,415	13,956	---	13,956	49,459	...	13,956	49,459	...	49,459
1994	...	95,999	32,590	32,590	63,409	14,083	---	14,083	49,326	...	14,083	49,326	...	49,326
1995	...	95,757	32,647	32,647	63,110	14,101	---	14,101	49,009	...	14,101	49,009	...	49,009
1996	...	95,497	32,697	32,697	62,800	14,123	---	14,123	48,677	...	14,123	48,677	...	48,677
1997	...	95,260	32,677	32,677	62,583	14,058	---	14,058	48,525	...	14,058	48,525	...	48,525
1998	...	95,053	32,664	32,664	62,389	14,228	---	14,228	48,161	...	14,228	48,161	...	48,161

- tax and duty revenues accruing to the Government would be considerable and could be adjusted to ensure a reasonable return to Government on its development expenditure;
- a firm basis would be established for several integrated rural development programmes which would be capable of expansion to other parts of the Study Area and of Sarawak as a whole.

3.4.2 Forestry

During the AP-period, which for forestry is taken as 1974 to 1980, practically all the forest harvesting is planned to be in preparation for release of land to agriculture. The locations of the land blocks concerned are shown in Figure 3.7 which also shows the date of release from forestry.

Although none of the land blocks within the FAO Units are due for release until after 1980, forest harvesting is expected to start during 1976.

In these Units the land blocks in which uncontrolled harvesting would be undertaken during the AP-period are as follows:

FAO Unit 1	Sigrak, Mekasi, Sibiu
FAO Unit 2	Timong, Timkar, Sedulang
FAO Unit 3	Kabatu

Simultaneously logging with silvicultural control would be carried out in land adjacent to those blocks named. The estimated acreages of forest involved are given in Table 3.20.

TABLE 3.20 ESTIMATED ACREAGES HARVESTED IN THE FAO UNITS

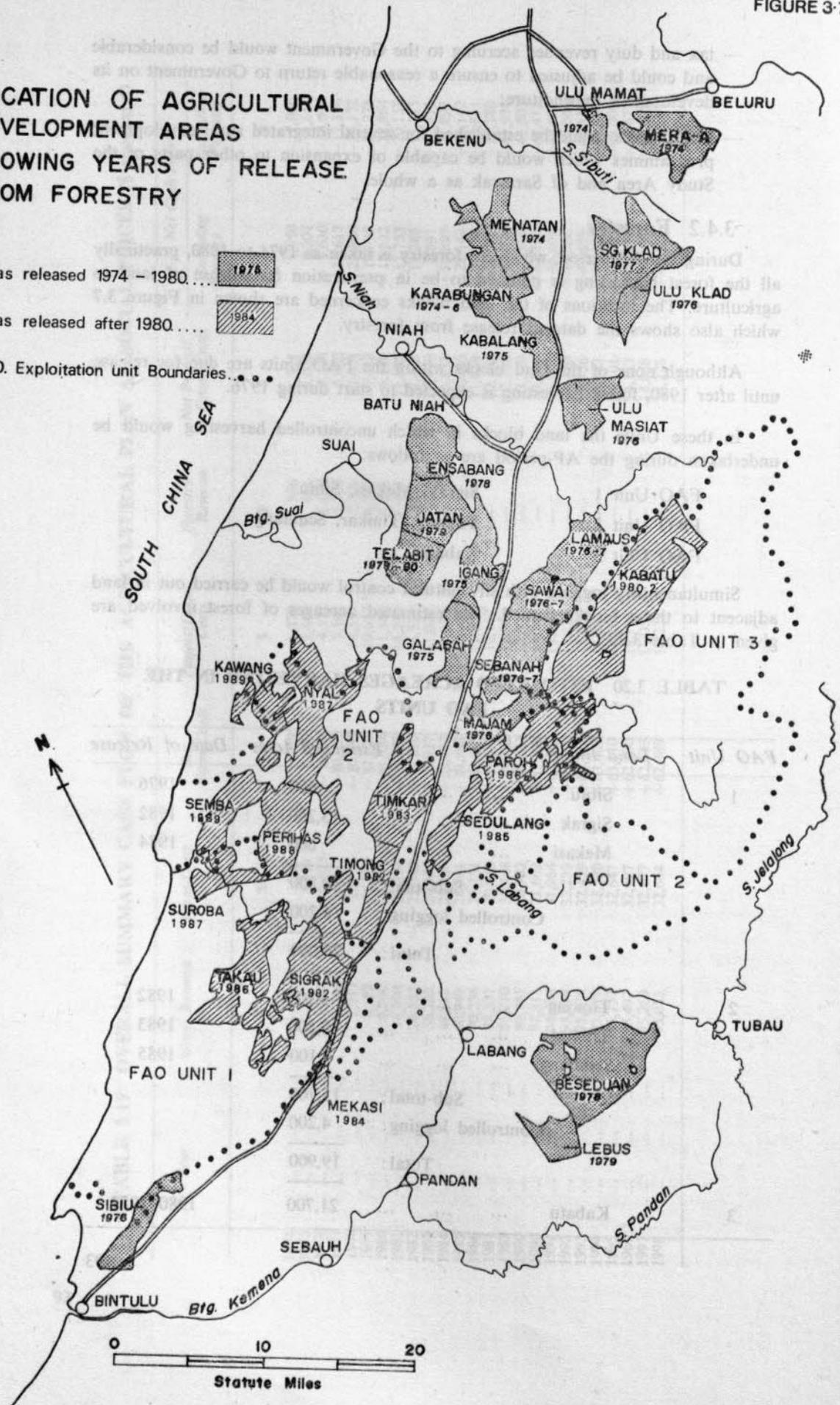
FAO Unit	Land Block	Estimated Acres	Date of Release
1	Sibiu	600	1976
	Sigrak	13,200	1982
	Mekasi	600	1984
	Sub-total:	19,800	
	Controlled logging:	6,200	
	Total:	26,000	
2	Timong	4,100	1982
	Timkar	8,500	1983
	Sedulang	3,100	1985
	Sub-total:	15,700	
	Controlled logging:	4,200	
	Total:	19,900	
3	Kabatu	21,700	1980-1982

LOCATION OF AGRICULTURAL DEVELOPMENT AREAS SHOWING YEARS OF RELEASE FROM FORESTRY

Areas released 1974 - 1980. [1974-80 pattern]

Areas released after 1980. [1981-89 pattern]

F.A.O. Exploitation unit Boundaries. [dotted line pattern]



A timber industry complex is also planned to be established at Long Lama but it will be harvesting forests in FAO Unit 7 which is outside the eastern boundary of the Study Area.

Outside the FAO Units the acreages of land scheduled for release, and on which uncontrolled or salvage logging will have been completed, are as follows:

Years	Outside Reserved or Protected Forests	In Reserved or Protected Forests
1974	14,050	nil
1975	6,500	6,300
1976	25,300	nil
1977	36,400	2,500
1978	20,850	nil
1979	2,600	7,900
1980	5,200	nil
	<u>110,900</u>	<u>16,700</u>

The majority of the above acreages are being exploited by private enterprise under licences already issued. In addition some 5,000 acres of peat swamp forest are being harvested annually under sustained yield conditions. Virtually all the production from the above leaves the Study Area in log form. Proposals are made in Volume II, Chapter 5 for the creation of additional timber processing industries and these have been described and evaluated in Annexure I as investible projects.

The estimated annual investments in the timber industry complexes are shown in Table 3.21 which also gives the expected throughput for each complex by 1980 and its ultimate likely capacity.

TABLE 3.21 INVESTMENT IN TIMBER INDUSTRY COMPLEXES DURING THE AP-PERIOD

Complex in FAO Unit	Investment (\$000)				Expected Throughput cubic feet/year thousands	
	1975	1976	1977-79	1980	1980	Ultimate Capacity
1	8,500	nil	nil	7,500	5,300	7,200
2	4,300	4,300	nil	nil	4,100	7,500
3	nil	8,500	nil	nil	4,000	7,500
7	8,800	nil	nil	7,900	5,500	7,000
Total:	21,600	12,800	nil	15,400	18,900	29,200

3.4.3 Supporting Government Activities and Agencies

(a) Semi-detailed Soil Surveys and Land-use Mapping

The importance of carrying out this work in coordination with other elements of the overall development cannot be overstressed. In Volume II, Chapter 4 emphasis is given to the need for early demarcation of the final boundaries between future agricultural land and future permanent forest areas. This is required

in remnant forest areas where salvage logging could be carried out, but it is of particular importance in the virgin forests before the forest industry complexes start logging operations. However, strict adherence to this requirement could necessitate the surveying of very large acreages during 1974 and 1975. These demands for field work and mapping would probably be greater than the capacity of the Soil Survey Branch if work is to be undertaken simultaneously in other parts of Sarawak. For this reason alternative suggestions have been given in Volume II, Chapter 4 and in Supporting Reports 2 and 3 for adopting modified forest harvesting regimes so that the semi-detailed soil surveying could be spread over a longer period. Table 3.22 gives acreages that would require surveying and mapping in each year under two conditions; the first in which the efficiency of forest utilisation is given priority consideration and the second where it is not. Neither conditions will interfere with the agricultural plan, but the implications (explained in Volume II, Chapter 4) of the delayed surveys for forest harvesting will require study by the Forest Department and the operators of the forest industry complexes.

TABLE 3.22 COMPARISON OF ANNUAL REQUIREMENTS FOR SOIL SURVEY AND LAND-USE MAPPING UNDER TWO DIFFERENT CONDITIONS

Year	<i>Assuming Work is Completed before Forest Harvesting Starts</i>		<i>Assuming Work is delayed in some Areas until after Forest Harvesting Starts</i>	
	<i>Acrees per Year</i>	<i>No. of Teams Required</i>	<i>Acrees per Year</i>	<i>No. of Teams Required</i>
1974	53,100	4 for 6 months	13,750	1 for 6 months
1975	107,350	4 for 12 months	73,900	3 for 10 months
1976	15,300	1 for 6 months	45,650	2 for 9 months
1977	5,500	1 for 2 months	43,150	2 for 9 months
1978	20,300	1 for 8 months	25,100	1 for 10 months
1979	33,100	1 for 12 months	33,100	1 for 12 months
1980 to 1982	26,500	1 for 3 months each year	26,500	1 for 3 months each year
Total Acres	261,150		261,150	

In brief, changes in boundaries of agriculturally suitable land caused by differences between broad transect and subsequent semi-detailed surveys for this purpose, may lead to uncontrolled logging in areas which ultimately should be retained as permanent forest. It is, therefore, desirable that, until semi-detailed soil surveys have been completed, controlled logging should be carried out throughout areas provisionally demarcated as agriculturally suitable.

The number of soil survey teams required each year under the two conditions is also shown. For this calculation the assumptions made were:

- that field work can continue throughout the year (this was proved practical by the Consultants during the Study);

- that one field team can survey 30,000 acres a year at an average rate of 2,500 acres a month.

The table shows that if the forestry demands are relaxed slightly then the early work load is reduced and the overall work load better spread out, which eases staffing problems considerably

This work should be undertaken by soil survey teams at present in the Research Branch of the Department of Agriculture. However, suggestions are made in Volume II, Chapter 9 that all work associated with the classification of land for future use should be the responsibility of the Land and Survey Department. Thus soil survey work may later come under that Department.

(b) Adjudication of Boundaries Between Legal and Illegal Occupation

The Consultants believe that this work could be undertaken by Administrative Officers in the particular Divisions and Districts concerned. To facilitate the process of adjudication of legal boundaries, it is recommended that the differentiation between legal and illegal occupation of land should be based upon the limits of clearing revealed in aerial photography taken between 1963 and 1968. Not only would this enable demarcation to be related to the 1:250,000 Land-use Maps Series No. 22 already in print and derived from those photographs, but it could be claimed as generous treatment of cultivators because the law does not in fact recognise customary rights over land cleared after 1955.

The programme required for coordination of this work with other activities in the Region is shown in Table 3.23. If it is at all practicable for some of this work to be completed earlier than indicated it should be done because in almost all areas illegal occupation is expanding and should be halted as soon as possible. The locations of the land blocks mentioned are shown in Figure 3.7.

(c) Survey and Demarcation of Boundaries

In Supporting Report 3 it is estimated that a total of about 800 miles of new boundaries will have to be surveyed and demarcated. Over 700 miles are boundaries dividing State Land required for agricultural development from either Native Customary Land or from future permanent Forest Reserves. The approximate 100 miles remaining are associated purely with forestry.

A programme for surveying and demarcating the boundaries associated with agricultural development is given in Table 3.24. It would appear reasonable in many instances to accept, as at present, a first demarcation on the ground of boundaries aligned by chain and prismatic compass; more accurate theodolite surveys could follow later. Efforts should be made to increase the rate of work of field teams by increasing the number of labourers per team and by the issue of chain saws. Assuming that the rate of work of a prismatic compass and chain team could be increased to 1,000 chains per month, then the number of teams required in any one year would not be too great, as can be seen from Table 3.24.

The Land and Survey Department is expected to undertake all this survey work, but responsibility for permanent demarcation of boundaries could be divided between that Department and the Forest Department on the following basis:

- all boundaries associated with future permanent Forest Reserves would be Forest Department responsibility;

— all other boundaries, i.e. those between agricultural development on State Land and Native Customary Land, would be the responsibility of the Land and Survey Department.

TABLE 3.23 SUMMARY OF BOUNDARY ADJUDICATION REQUIRED TO BE DONE BY THE ADMINISTRATIVE OFFICERS OF THE FOURTH DIVISION

<i>Action Required Before or During Year</i>	<i>Land Block Concerned</i>	<i>Year Land is Scheduled for Release</i>	<i>Agricultural Development Agency</i>
1974	Mera-a	1974	SLDB and private.
	Menantan	1975	Private.
	Karabungan	1974-1978	NLC, Department of Agriculture and private.
	Ulu Mamat	1975	Private.
1975	Sibiu	1976	Agricultural University.
	Ulu Masiat	1977	Private.
	Sungai Klad	1977	Private.
	Galasah	1976	SLDB.
	Sebanah	1976	SLDB and private.
	Timkar	1984	SLDB.
	Majam	1976	Private.
	Sungai Mekasi	1984	Private.
	Beseduan	1978	Private.
	Lebus	1979	Private.
	1976	Lamaus	1977	SLDB.
1977	Ensabang	1978	SLDB and private.
1978	Jatan	1979	SLDB.
	Telabit	1979	SLDB.
1980	Nyal	1987	SLDB.
	Kawang	1989	SLDB.

3.4.4 Conservation

Although under existing legislation, full protection has been given to some species of animals and birds, other formerly abundant species are suffering from a rapid decline in numbers. Interesting and some unique flora are also threatened. The solution is the complete protection of all wildlife within substantial tracts of the Study Area.

The Plan supports the creation of five National or Forest Parks for which proposals have already been submitted to Government. These are Niah, Similajau, Loagan Bunut, Lambir and Sungai Dalam. The Plan also proposes the creation of further Parks as follows:

- (a) Tanjung Lobang Coastal Protection Reserve—a strips of cliff-top land with a picturesque headland and other scenery.
- (b) Bukit Dulit Conservation Area which is the only remaining occurrence of montane forest in the Study Area.

Details are provided in Volume II, Chapter 4.

TABLE 3.24 PROGRAMME OF BOUNDARY SURVEYS TO BE UNDERTAKEN BY THE LAND AND SURVEY DEPARTMENT

Year	Rural Development Area	Land Block Concerned	Estimated Length of Boundary (Miles)	Estimated Number of Survey Teams (1) Required Using Compass & Chain System	Number of Teams	Remarks
1974	Lambir Subis	Mera-a	22	2		
	Lambir Subis	Menantan	20			
	Lambir Subis	Karabungan	16			
	Lambir Subis	Ulu Mamat	6			
	Niah-Suai	Igang	10			
	Bintulu	Sibiu	23			
Total 1974			97			Assuming only 6 months of year remain.
1975	Lambir Subis	Ulu Masiat	10	2		
	Lambir Subis	Ulu Klad and Sungai Klad	35			
	Niah-Suai	Galasah	16			
	Niah-Suai	Sebanah	22			
	Niah-Suai	Kabatu	45			
	Sekudong	Timong and Timkar	44			
	Sekudong	Majam	26			
	Sekudong	Sigrak	42			
	Sekudong	S. Mekasi	12			
	Labang-Tubau	Besedian	26			
	Labang-Tubau	Lebus	13			
Total 1975			291			Assuming 12 months work is possible.
1976	Miri	Sungai Dalam National Park	7	1		
	Niah-Suai	Sawai	7			
Total 1976			14			Assuming team works for 1½ months.
1977	Long Lama	Loagan Bunut National Park	20	1		
	Niah-Suai	Ensabang	19			
Total 1977			39			Assuming team works for 4 months.
1978	Niah-Suai	Jatan	11	1		
	Niah-Suai	Telabit	13			
	Sekudong	Sedulang	11			
	Sekudong	Takau	28			
Total 1978			63			Assuming team works for 5 months.
1979	Sekudong	Paroh	27	1		
	Nyalau	Nyal	44			
Total 1979			71			Assuming team works for 6 months.
1980 to 1982	Nyalau	Kawang	37	1		
	Nyalau	Perihas	21			
	Nyalau	Semba	32			
	Nyalau	Suroba	30			
	Nyalau	Similajau National Park	32			
Total 1980 to 1982			152			Assuming team works 4 months a year.

(1) Assumptions concerning survey teams.

A chain and compass team consists of 1 Demarcator, one Chainman and 8 Labourers. A team can complete 1,000 chains per month; average 12 miles per month.

While no specific timing has been given for the establishment of the above, the establishment of the Niah National Park requires the most urgent action to safeguard the preservation of the swiftlet and bat populations of the Niah caves and their feeding ground. Similar urgent action is also required in the case of Logan Bunut National Park for which a study is proposed to seek ways to preserve and improve the fishing potential in the lake of that name.

The Sungai Dalam Forest Park containing a small area of unique Kerangas forest has been encroached upon by Miri Airport and the residue should be immediately protected. Similar action should be taken in regard to the Bukit Dulit Conservation Area.

3.4.5 Manufacturing

The principal enterprises included in the Action Programme have been listed previously. Table 3.25 indicates the potential annual investments in these enterprises.

TABLE 3.25 INVESTMENTS IN SPECIFIC PROJECTS IN THE MANUFACTURING SECTOR IN THE AP-PERIOD (\$000)

Item	1975	1976	1977	1978	Total	Expected Production Capacity
Furniture Factory	300	—	—	—	300	30,000 pieces per year
Particle Board Factory	—	—	4,000	2,000	6,000	100 cu. metres per day
Moulding Factory	1,000	100	—	—	1,100	10,000 tons per year
Parquet Factory	—	1,500	1,000	—	2,500	2.5 mn square feet per year
Plywood Factory	—	3,600	2,000	—	5,600	20,000 tons per year
Prefabricated Housing Plant	500	—	—	—	500	800 units per year
Impregnating Plant	300	—	—	—	300	5,000 tons per year
Iron Foundry	—	1,800	—	—	1,800	150 tons per month
Total:	2,100	7,000	7,000	2,000	18,100	

The total investment of about \$18 mn (excluding the LNG plant) shown in the table represents only 24 per cent of the grand total investment expected in manufacturing over the AP-period. Other large investments include the LNG plant, three industrial sites for small-scale industries and a glass factory.

Pre-feasibility studies were made of the following enterprises which are presented as investible projects in Annexure I.

- (a) A glass container factory.
- (b) Wood based industries including,
 - a sawmill.
 - drying kilns.
 - moulding plant.
 - impregnating plant.
 - prefabricated housing plant.
- (c) An iron foundry.

TABLE 3.26 ROAD CONSTRUCTION AND IMPROVEMENTS 1975-1980

	1975		1976		1977		1978		1979		1980		Total 1975-1980	
	Miles	Costs \$	Miles	Costs $	Miles	Costs $	Miles	Costs $	Miles	Costs $	Miles	Costs $	Miles	Costs \$
Trunk Roads ...	...	5,755	15.1	4,577	12.5	3,240	nil	nil	nil	nil	nil	nil	47.6	13,572
Secondary Roads ...	...	1,600	8.0	1,600	8.0	1,600	4.8	960	nil	nil	nil	nil	28.8	5,760
Improved Feeder Roads ...	...	2,710	11.3	1,695	5.5	830	6.1	910	20.4	3,060	14.0	2,100	77.9	11,305
Feeder Roads ...	...	nil	4.1	492	nil	nil	2.7	324	6.5	780	4.1	492	17.4	2,038
Urban Roads ...	...	617	9.1	921	17.1	1,432	19.2	1,887	12.7	1,074	9.9	990	76.4	6,921
Sub-Total ...	57.0	10,682	47.6	9,285	43.1	7,102	32.8	4,081	39.6	4,914	28.0	3,582	248.1	39,646
<i>Improvements and Surfacing</i>														
Trunk Roads ...	...	2,500	30.5	7,000	26.5	6,000	18.0	4,160	17.0	4,000	17.0	4,000	119.5	27,660
Secondary Roads ...	...	500	2.3	500	nil	nil	3.0	1,500	3.0	1,500	nil	nil	10.6	4,000
Bridges ...	...	250	—	700	—	500	—	250	—	nil	—	nil	—	1,700
Sub-Total ...	12.8	3,250	32.8	8,200	26.5	6,500	21.0	5,910	20.0	5,500	17.0	4,000	130.1	33,360
Total ...	69.8	13,932	80.4	17,485	69.6	13,602	53.8	9,991	59.6	10,414	45.0	7,582	378.2	73,006

TABLE 3.27 URBAN ROADS PLANNED FOR CONSTRUCTION BETWEEN 1974-1980

Town	1974		1975		1976		1977		1978		1979		1980		
	Miles	Costs													
Ladang Tiga, Subis I + II	6.3	—	—	—	—	—	—	—	—	—	—	—	
Ladang Empat	—	40	—	—	—	—	—	—	—	—	—	—	
Mera-a	2.2	44	—	—	—	—	—	—	—	—	—	—	
Igang	—	—	3.3	200	3.3	200	3.3	190	—	—	—	—	
Galasah	—	—	—	—	2.5	150	—	—	—	—	—	—	
Sebanah	—	—	—	—	3.6	254	—	—	—	—	—	—	
Lamaus	—	—	—	—	—	—	4.2	267	—	—	—	—	
Ensabang	—	—	—	—	—	—	—	—	4.2	267	—	—	
Telabit	—	—	—	—	—	—	—	—	—	—	1.4	188	
Timong	—	—	0.4	8	—	—	—	—	—	—	—	—	
Miri(1)	3.3	500	3.3	500	3.3	500	3.3	500	3.3	500	3.3	500	
Bintulu(2)	—	—	1.2	180	1.2	180	1.2	180	1.2	180	1.2	180	
Long Lama	—	—	—	—	—	—	4.1	615	1.4	29	1.5	29	
Batu Niah	—	—	0.9	33	0.9	33	1.0	33	1.0	33	1.0	33	
Marudi	—	—	—	—	1.3	40	1.3	40	1.3	40	1.1	35	
Beluru	—	—	—	—	—	—	0.3	25	0.3	25	0.4	25	
Bekenu	—	—	—	—	—	—	0.5	37	—	—	—	—	
Labang	—	—	—	—	1.0	75	—	—	—	—	—	—	
Total	6.3	8.4	617	9.1	921	17.1	1,432	19.2	1,887	12.7	1,074	9.9	990

(1) Mileages are estimated on the basis of cost figures taken from the Mid Term Review of the Second Malaysia Plan.

(2) Excludes trunk roads in the Tanjung Kidurong Area.

3.4.6 Infrastructural Development

(a) Road Construction

The locations of roads scheduled for construction during the AP-period are shown on the Action Programme Map. A summary of the annual mileages to be completed and their estimated costs are given in Tables 3.26 and 3.27. Further details are presented in the Development Packages and Phasing Tables given in Annexure II.

(b) Village Construction

A total of nine villages and one Sub-regional Centre are planned to be started before 1980. The total is in addition to two villages in the existing SLDB Subis Scheme. A phasing of the planned commencement of construction of the villages is given in Table 3.28. Detailed phasing of the numerous activities associated with building the villages, such as planning, clearing and destumping the areas, road and house construction, are given in the Rural Development Packages in Annexure II.

TABLE 3.28 PLANNED PHASING OF COMMENCEMENT OF VILLAGE AND TOWN CONSTRUCTION

Year	Name of Village or Town	Remarks
1974	Subis I and II	Both are included in SLDB development plans and are already started.
	Sepupok	Associated with an on-going block alienation scheme.
1975	Ladang Empat	Already included in SLDB development plans.
	Mera-a	First village associated with an SLDB developed smallholder sub-scheme.
1976	Igang	Planned to become a Sub-regional Centre started by having in it all personnel and facilities associated with the SLDB nucleus estate.
1977	Galasah Sebanah	The second and third villages associated with SLDB developed smallholder sub-schemes.
1978	Lamaus	The fourth village associated with an SLDB developed smallholder sub-scheme.
1979	Ensabang	The fifth village associated with an SLDB developed smallholder sub-scheme.
1980	Telabit	The sixth village associated with an SLDB developed smallholder sub-scheme.

In addition there are extensions and improvements planned to the following existing towns and villages; Miri, Bintulu, Marudi, Long Lama, Batu Niah, Beluru, Bekenu, Niah, Sebauh, Labang and Tubau. This work will be undertaken continuously throughout the AP-period; details are given in the Town Development Packages presented in Annexure II.

The details included in the Rural Development Packages and the Town Development Packages give, among other things, the phasing within each village or town of the following:

- (a) Housing—type, numbers and period of construction. Extracts from the Development Packages are given for housing in Tables 3.29 and 3.30.
- (b) Public services and utilities which covers:
 - education buildings from primary schools to vocational training centres;
 - health centres and hospitals;
 - administration, post office, police stations, fire stations, refuse disposal and street cleansing;
 - provision of water, sewage, electricity, gas and telecommunications;
 - recreation facilities and religious buildings.
- (c) Private services which covers:
 - the construction of shophouses and stalls for the sale of retail and wholesale consumer goods;
 - other services such as restaurants, coffee-houses and cinemas.

The Rural and Town Development Packages present the planned activities of the Action Programme by locality. All the activities planned for one area, town or village, during the AP-period, are brought together in one table. But in addition in Annexure II, six tables are presented which bring together for each year of the AP-period all the activities planned to be started in the particular year.

Included in the Development Packages and the annual tables are year by year estimated investment and recurrent costs of the activities together with the agencies concerned in the implementation. Thus for any particular activity or agency the programme of work, the locality of it, and the estimated cost of it can be obtained.

Figures 3.8 to 3.16 present a diagrammatic summary of each development package showing the phasing of implementation and the total annual investments. Also given are the locations of the activities making up each package.

3.5 FINANCIAL SUMMARY

This Section contains tables which summarise the investment requirements of the Action Programme, first by production sector and then by government agency. The source of these summary tables is Annexure II where the programmed investments are itemised in greater detail. A glossary of agency abbreviations is given in the end of this Section.

3.5.1 Investment by Sector

Table 3.31 shows the whole investment for the AP-period divided by major sectors. The transport sector, inclusive of the deep water port, requires the greatest investment; \$160 million or nearly 25 per cent of the total. Investments in agriculture are the next highest amounting to \$125 million or nearly 20 per cent of the total. The remaining 55 per cent of the total investments are fairly evenly distributed over the other sectors of the economy.

TABLE 3.29 THE HOUSING CONSTRUCTION PROGRAMME (INFORMATION OBTAINED FROM RURAL AND TOWN DEVELOPMENT PACKAGES IN ANNEXURE II)

Locality	Number of Units	Planned Construction Period						
		1974	1975	1976	1977	1978	1979	1980
Existing Villages and Towns								
Miri	1,395							
Bintulu	1,314							
Marudi	155							
Long Lama	310							
Batu Niah	155							
Beluru	77							
Bekenu	48							
Sebauh	30							
Labang	41							
Tubau	20							
Sub-Total ...	3,545							
New Towns and Villages								
Subis I	292							
Subis II	292							
Ladang Empat	277							
Mera-a	225							
Sepupok	196							
Igang	628							
Galasah	162							
Sebanah	265							
Lamaus	331							
Ensabang	329							
Telabit	67							
Sub-Total ...	3,064							
In Road Based and Private Development Schemes								
Near Batu Niah	27							
Ulu Mamat	124							
Menantan	78							
Ulu Klad	90							
Majam	212							
Ulu Masiat	171							
Sungai Klad	393							
Near Tubau	27							
Near Bukit Peninjau	48							
Near Beluru	36							
Near Marudi	55							
Near Bintulu 10th mile	38							
Near Bekenu	38							
Near Long Lama	52							
Near Labang	114							
Sub-Total ...	1,503							
Grand Total ...	8,112							

TABLE 3.30 PHASING OF INVESTMENTS IN HOUSING (\$ 000)

Commencement of Investment Year	Budget Responsible Agency	Investment Associated with Housing Programme Commencing in Specified Year						
		1975	1976	1977	1978	1979	1980	Total
1975	SLDB	3,756	1,673	—	—	—	—	—
	HDC/PWD/Private	4,003	4,003	4,003	4,003	4,003	4,003	—
	HDC/Private	235	235	235	235	235	238	—
	Private	911	911	911	911	911	916	—
	1975 Total	8,905	6,822	5,149	5,149	5,149	5,157	36,331
1976	SLDB	—	349	697	697	697	700	—
	HDC/Private	—	433	466	66	66	70	—
	1976 Total	—	782	1,163	763	763	770	4,241
1977	Private	—	—	320	480	339	235	1,374
1978	SLDB	—	—	—	1,885	1,489	413	—
	Private	—	—	—	686	903	964	—
	1978 Total	—	—	—	2,571	2,392	1,377	6,340
1979	SLDB	—	—	—	—	548	1,097	—
	Private	—	—	—	—	732	1,353	—
	1979 Total	—	—	—	—	1,280	2,450	3,730
1980	SLDB	—	—	—	—	—	335	—
	Private	—	—	—	—	—	55	—
	1980 Total	—	—	—	—	—	390	390

SUMMARY BY YEARS

1975-1980 Total	8,905	7,604	6,632	8,963	9,923	10,379	52,406
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SUMMARY BY AGENCY AND YEARS

SLDB	3,756	2,022	697	2,582	2,734	2,545	14,336
HDC/PWD/Private	4,003	4,003	4,003	4,003	4,003	4,003	24,018
HDC/Private	235	668	701	301	301	308	2,514
Private	911	911	1,231	2,077	2,885	3,523	11,538
							52,406

TABLE 3.31 ACTION PROGRAMME INVESTMENTS BY SECTORS (\$ mn)

Sector	1975	1976	1977	1978	1979	1980	Totals	Per cent
Agriculture	19.6	15.7	27.0	20.3	20.1	22.2	125	19
Forestry	21.6	12.8	nil	nil	nil	15.4	50	8
Housing	8.9	7.6	6.6	9.0	9.9	10.4	53	8
Transport (excluding the deep water port)	18.5	19.9	14.1	11.9	12.6	7.7	85	13
— deep water port	nil	nil	20.0	20.0	20.0	15.0	75	11
Public Services	8.1	6.4	9.7	13.5	8.9	10.4	57	9
Public Utilities	11.3	11.3	13.0	16.9	13.4	9.4	75	11
Private Services	11.0	12.7	11.7	11.6	11.3	11.8	70	10
Manufacturing	8.3	17.5	16.7	14.0	9.0	10.0	75	11
Total:	107	104	119	117	105	112	665	100

NOTE: All totals are rounded and amounts invested in the oil and petro-chemical industry are excluded.

TABLE 3.32 ACTION PROGRAMME INVESTMENTS BY BUDGET-RESPONSIBLE AGENCIES⁽¹⁾ (\$ mn)

Agencies ⁽²⁾	1975	1976	1977	1978	1979	1980	Totals	Percent
DA	1.9	2.2	3.4	3.4	2.7	2.1	15	2
PWD (excluding the deep water port)	25.3	28.3	20.6	21.0	21.0	12.3	128	20
— Deep Water Port	—	—	20.0	20.0	20.0	15.0	75	11
ED	4.9	3.7	4.7	7.4	2.8	4.3	28	4
MD	0.1	0.1	3.1	5.1	5.0	5.0	18	3
PSD	0.5	—	0.1	0.3	0.1	—	1	—
RMP	0.2	0.4	0.7	0.3	—	—	2	—
TELECOMS	2.3	0.1	2.0	2.7	1.3	1.2	10	1
SPU	0.2	0.1	0.1	0.1	0.7	0.6	2	—
DC	0.1	0.1	0.1	0.2	0.2	0.2	1	—
Sub-Total: Public Agencies	35	35	55	62	53	40	280	41
SLDB	18.3	12.6	19.5	12.4	10.2	10.1	83	13
SLDB/SESCO	—	—	0.1	0.1	0.1	0.1	—	—
SEDC	—	—	3.0	5.0	—	—	8	1
SESCO	3.4	3.7	3.6	4.2	2.5	2.8	20	3
NLC	3.3	2.0	0.8	—	—	—	6	1
Sub-Total: Statutory Bodies	25	18	27	21	13	13	117	18
SLDB/PWD	—	0.2	0.9	0.2	0.3	0.2	2	—
SLDB/ED	—	—	—	—	—	—	—	—
DC/SESCO	0.4	0.5	0.5	0.5	0.6	0.6	3	—
Sub-Total: Mixed Public Agencies and Statutory Bodies	—	1	1	1	1	1	5	1
Private	26.2	18.7	8.2	12.0	14.8	33.7	114	18
BDC	2.5	—	—	—	—	—	3	—
HDC/Private	1.0	1.3	1.3	1.0	1.0	1.0	6	—
HDC/PWD/Private	4.0	4.0	4.0	4.0	4.0	4.0	24	4
SEDC/Private	12.8	20.8	15.2	15.5	18.1	19.2	102	15
STIDC/Private	—	5.1	7.0	2.0	—	—	14	2
Sub-Total: Private and Semi-private Agencies	47	50	36	34	38	58	263	40
TOTAL	107	104	119	117	105	112	665	100

NOTE: All totals and Sub-totals are rounded figures.

(1) See explanation in Annexure II.

(2) A glossary of agency abbreviations is given at the end of this volume.

3.5.2 Investment by Budget-responsible Agency

Table 3.32 shows the allocation of the Action Programme investments according to budget-responsible agencies. The two most important agency groups are the Public Agencies, and the Private and Semi-private Agencies, each with about 40 per cent of total investments. Individually PWD has by far the largest allocation; even excluding the deep water port its budget is larger than any other agency.

In order to give an indication of the magnitude of the investments expected in the Study Area during the AP-period, Table 3.33 has been compiled to compare previous actual expenditures with planned expenditures. The table shows that the total annual planned expenditure of the Public Agencies is about four times that spent during 1969 to 1970, while for all Statutory Bodies the planned expenditure is about nine times larger than previously. While increases are expected over all agencies, by far the largest are planned for PWD, SLDB and SEDC. In the above comparison it must be borne in mind that substantial increases in expenditures had already taken place during the period 1971 to 1974.

TABLE 3.33 AVERAGE ANNUAL INVESTMENT COSTS 1969-70 AND 1975-80 BY AGENCIES (\$ mn)

Agencies	Annual Average Investment Costs	
	1969-70	1975-80
DA	0.9	2.5
PWD (exclusive of deep water port)	6.0	21.3
ED	0.4	4.7
MD	0.2	3.0
PSD	—	0.1
TELECOMS	0.7	1.7
DC	0.2	0.2
Other Departments	0.1	0.1
Total: Public Departments	8.5	33.6
SLDB/SEDC	0.8	15.2
SESCO	1.2	3.3
Total: Statutory Bodies	2.0	18.5

The budget figures so far presented have shown that PWD has not only the largest future allocation of funds but also the largest increase. These figures refer to work directly under PWD jurisdiction. However, PWD will also carry out work for other public agencies. The investment costs for all projects implemented by PWD are shown in Table 3.34. The total investments are seen to be nearly \$180 mn, excluding the deep water port, implying that work worth about \$50 mn will be undertaken for other public agencies. Investments in the Transport Sector are clearly the largest, followed in turn by Public Services and Public Utilities.

TABLE 3.34 INVESTMENT COSTS BY SECTORS FOR PROJECTS IMPLEMENTED BY PWD IN AP-PERIOD (\$ mn)

<i>Sector</i>	1975	1976	1977	1978	1979	1980	Totals
Agriculture	0.6	0.1	—	0.1	0.1	—	1
Transport (exclusive of deep water port)	17.7	19.2	13.0	12.8	13.1	7.4	83
Public Services	5.9	4.8	8.9	13.7	7.4	8.9	50
Public Utilities	5.7	7.2	6.8	9.3	8.7	4.8	43
Total:	30	31	29	40	30	21	177
Deep Water Port	—	—	20	20	20	15	75

NOTE: All totals are rounded figures.

3.5.3 Operating Costs

The distribution of project operating costs between sectors during the Action Programme is shown in Table 3.35. A further break-down of the figures by budgeting agency is given in Table 3.36. In contrast to the allocation of investment costs the operation of Public Agency projects constitutes only a relatively small proportion of the total operating costs, only \$50 mn or 20 per cent of the total, whereas for Private and Semi-private Agencies it is \$236 mn or 50 per cent of the total. However, the Public Agencies' operating costs, similar to the costs in all other sectors, are expected to increase annually, thus necessitating continuously growing public revenues.

TABLE 3.35 ACTION PROGRAMME OPERATING COSTS BY SECTORS (\$ mn)

<i>Sector</i>	1975	1976	1977	1978	1979	1980
Agriculture	4.0	17.5	27.0	37.9	44.8	50.0
Forestry	4.6	9.0	12.2	9.6	11.0	12.6
Housing	—	—	—	—	—	—
Transport	0.1	0.4	0.7	1.0	1.3	1.6
Public Services	—	1.2	1.8	2.4	3.5	4.8
Public Utilities	5.7	6.8	8.6	9.0	10.7	12.0
Private Services	—	5.3	11.3	16.9	22.8	28.8
Manufacturing	—	2.9	15.8	21.2	24.2	24.3
Total	14	43	77	98	118	134

NOTE: All totals are rounded.

TABLE 3.36 ACTION PROGRAMME OPERATING COSTS BY BUDGET-RESPONSIBLE AGENCIES⁽¹⁾ (\$ mn)

Agencies ⁽²⁾		1975	1976	1977	1978	1979	1980	Total
DA	...	0.7	1.1	1.4	1.9	2.3	2.9	10
L & SD	...	0.5	0.3	0.3	0.2	0.2	0.2	2
L & SD/FD	...	0.1	2.0	2.6	3.1	3.5	4.0	16
PWD	...	1.1	0.5	0.8	1.0	2.0	2.2	7
ED	...	—	—	—	0.1	0.1	1.1	1
MD	...	—	0.1	0.1	0.1	0.1	0.2	1
FSD	...	—	—	0.1	0.3	0.3	0.3	1
RMP	...	—	1.8	1.9	2.0	2.2	2.7	12
TELECOMS	...	1.7	—	—	—	—	0.1	1
SPU	...	—	—	—	0.1	—	0.1	—
DC	...	—	—	—	—	0.1	0.1	—
Sub-Total: Public Agencies		4	6	7	9	11	13	50
SLDB	...	2.4	15.7	24.6	34.6	40.0	43.8	161
SEDC	...	—	—	—	0.6	1.5	1.5	4
SESCO	...	2.3	3.0	4.5	4.5	5.7	6.1	26
NLC	...	0.3	0.4	0.4	0.5	0.5	0.5	3
Sub-Total: Statutory Bodies		5	19	30	40	48	52	194
SLDB/PWD	...	—	—	—	—	0.1	0.1	—
DC/SESCO	...	0.6	0.6	0.7	0.7	0.8	0.9	4
Sub-Total: Mixed Public Agencies and Statutory Bodies		0.6	0.6	0.7	0.7	0.9	1.0	4
Private	...	—	—	—	—	—	—	—
SEDC/Private	...	4.7	13.7	25.5	24.0	28.2	33.2	129
STIDC/Private	...	—	3.8	9.5	13.9	18.2	20.6	66
	...	—	—	5.5	10.4	12.5	12.5	41
Sub-Total: Private and Semi-private Agencies		5	18	40	48	58	67	236
Total		14	43	77	98	118	134	484

NOTE: All totals are rounded figures.

(1) See explanation in Annexure II.

(2) A glossary of agency abbreviations is given at the end of this Section.

3.5.4 Revenues

Revenues will accrue to investments either from the sale of goods and services, as in the case of production or service enterprises, or from taxation in the case of roads, schools and other social services. Where possible, estimates of revenue in specific sectors or projects have been made. These are included in the relevant Supporting Reports and summarised in the Project Forms presented in Supporting Report 10. However, in the case of most public services and infra-structural investments this is not possible, and a more general appraisal of financial viability has been carried out in the form of the macro-economic projections presented in Section 2.4. The overall financial balance of the Action Programme is discussed in Section 3.5.5.

Agriculture

In Supporting Report 2, Part II, a complete economic analysis is given of the proposed agriculture development started during the AP-period. A summary has been given previously in this Chapter. Under the assumptions used the agricultural projects are economically self-sustaining.

Forestry

Revenue has traditionally been based on the export of logs and has been particularly sensitive to price fluctuations. This sensitivity will of course continue but the increasing importance of local timber processing will reduce this effect. Detailed economic evaluations of the proposed timber complexes were carried out by the FAO Forest Industry Development Team and therefore outside the scope of the present study. A general evaluation of the rise in output and production value in the sector is included in Supporting Report 3, and incorporated into the macro-economic projections.

Housing

It may be difficult to create an economic balance in this sector because the market costs of new houses will tend to be above the means of the lower income groups, which constitute the larger part of the population. However, the planned housing programme is based on estimated future incomes and on a rent/income relationship which would allow for a self-sustained housing sector provided that the suggestions outlined in Volume II, Chapter 8 are implemented and are successful in controlling site, building and financing costs.

Transport

Revenues in this sector will be obtained through fares for land, sea and air travel, from port dues and from vehicle licence fees. Examples of possible ways of reducing present high transport costs are given in Supporting Report 7, where it is shown that the transport sector, as a whole, is expected to be self-sustaining after an initial period of high investment costs.

Public Utilities

Public utilities are usually operated on a self-balanced financial basis, where costs are covered by charges on the users according to their consumption. This will, in general, apply to all public utility projects incorporated in the Action Programme. However, it can be expected that some users will not be able to pay the full costs at the beginning of the operation of the utilities, implying a certain degree of subsidy during an initial period.

Private Services

Private services will be established when it is believed that sufficient customers and purchasing power are created to operate them economically.

Manufacturing

Manufacturing will generally follow the same line as private services. For a selected number of enterprises pre-investment studies have been carried out and are described in Supporting Report 8, and in Annexure I. As the Area is presently only slightly industrialised some new industries may need initial support until they attain economic balance.

Public Services

These will be paid for out of public funds and as such will depend upon the prosperity and growth of the economy arising out of the other main sectors. In Section 2.4 it is demonstrated that, subject to a certain assumptions on economic growth and savings, the regional economy will be able to afford the planned level of public sector spending and maintain long-run equilibrium.

3.5.5 Financing

Investments and Finance

This section discusses the relationship between the capital requirements of the Action Programme and the sources available for financing them. The sources of finance for development of the Region will be:

- Regional savings from private persons, private business and from the public through taxation;
- State and Federal grants;
- State and Federal loans;
- foreign direct investments in new and present enterprises in the Region;
- loans from international lending agencies to the Federation from which loans would be allocated to the Region.

The financial requirements for investments included in the Action Programme has been given in Table 3.32. The distribution can be summarised as follows:

	<i>\$ mn</i>
Public Agencies (including Mixed Public Agencies and Statutory Bodies)	285
Private and Semi-private Agencies (excluding the oil, gas and petro-chemical industry) ...	263
Statutory Bodies	117
Total	<u>665</u>

The anticipated financial contributions from the Region are given below. The amounts have been calculated using the figures, and associated assumptions, from Tables 2.12 (Use of GRP):

	<i>\$ mn</i>
For public investments	175
For private investments	150
Total	<u>325</u>

These figures assume that taxation would be increased as necessary, that the net contribution of the Study Area to overall State and Federal purposes would be zero and that private Regional savings are also invested locally.

The subsequent financial gap, divided between budget-responsible groups, would then amount to:

	\$ mn
Public Agencies (exclusive of contributions to Statutory Bodies)	110
Private and Semi-private Agencies	113
Statutory Bodies	117
	<hr/>
Total ...	340
	<hr/>

The major part—namely \$82 mn—of the gap attributed to Public Agencies could most suitably be financed by foreign loans or grants since this amount would include the following projects:

- the deep water port near Bintulu;
- the bridges on the Miri-Bintulu Road and on the Lutong-Kuala Baram Road;
- the new University at Bintulu.

The investment costs of the timber complexes are suitable for financing by joint ventures between regional capital and direct foreign investment. Indications from present (March 1974) negotiations are that two complexes, the ones in Bintulu (FAO Unit 1) and Suai (FAO Unit 3) totalling investments of about \$25 mn, will be financed this way. This would reduce the financial gap of Private and Semi-private Agencies to about \$90 mn.

The financial gap of Statutory Bodies could be reduced by about \$20 mn because foreign companies, working in joint venture with SEDC, will probably bear a considerable part of the investment costs in question. This concerns, for instance, the amounts associated with a new glass factory, bottling plant, particle board manufacturing, parquet factory and plywood factory.

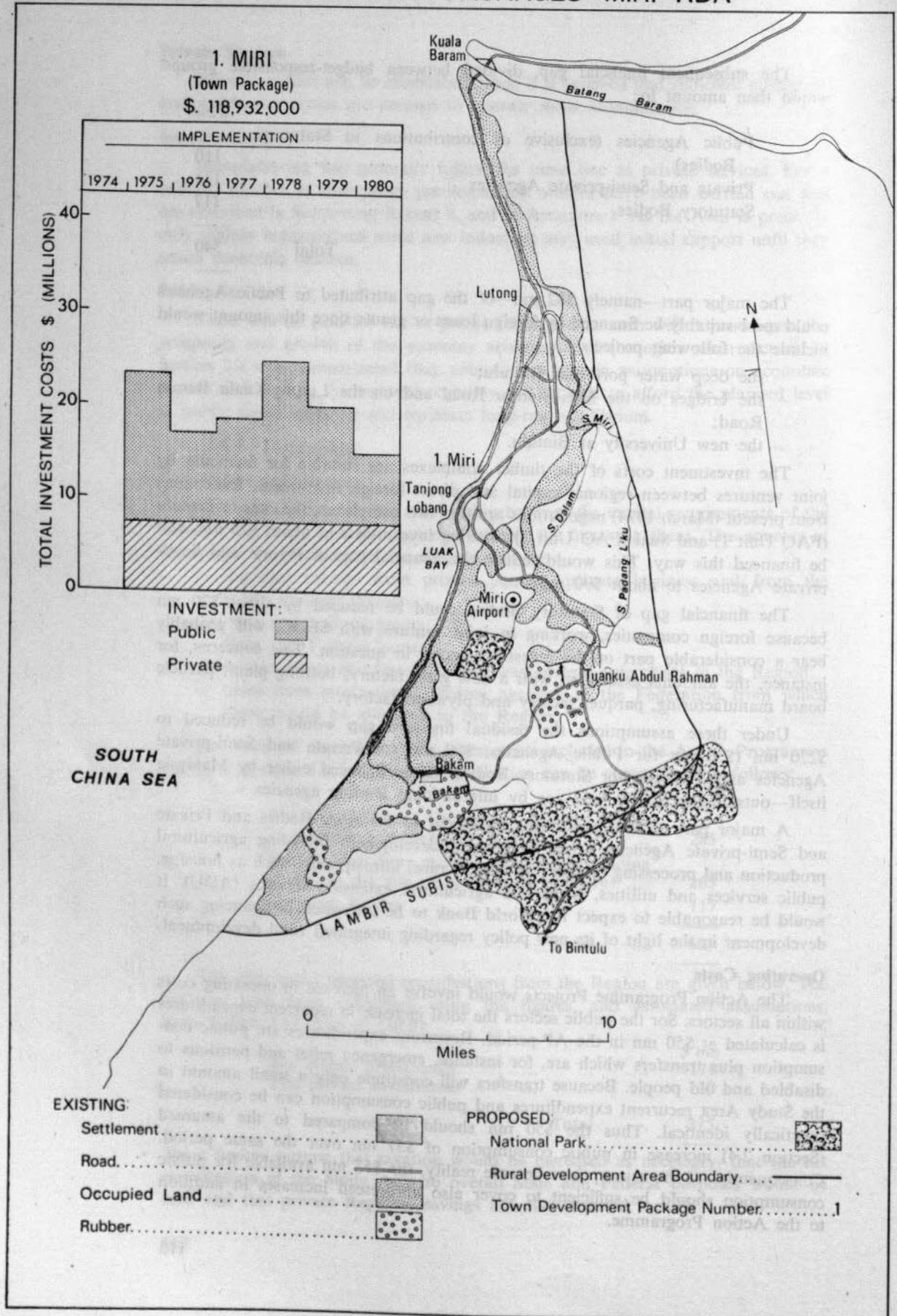
Under these assumptions the residual financial gap would be reduced to \$220 mn (\$30 mn for Public Agencies, \$90 mn for Private and Semi-private Agencies and \$100 mn for Statutory Bodies) to be financed either by Malaysia itself—outside the Study Area—or by international lending agencies.

A major part of the investments attributed to Statutory Bodies and Private and Semi-private Agencies arises from rural development including agricultural production and processing facilities as well as rural infrastructure such as housing, public services and utilities, roads and agricultural extension services (ADU). It would be reasonable to expect the World Bank to be interested in financing such development in the light of its new policy regarding integrated rural development.

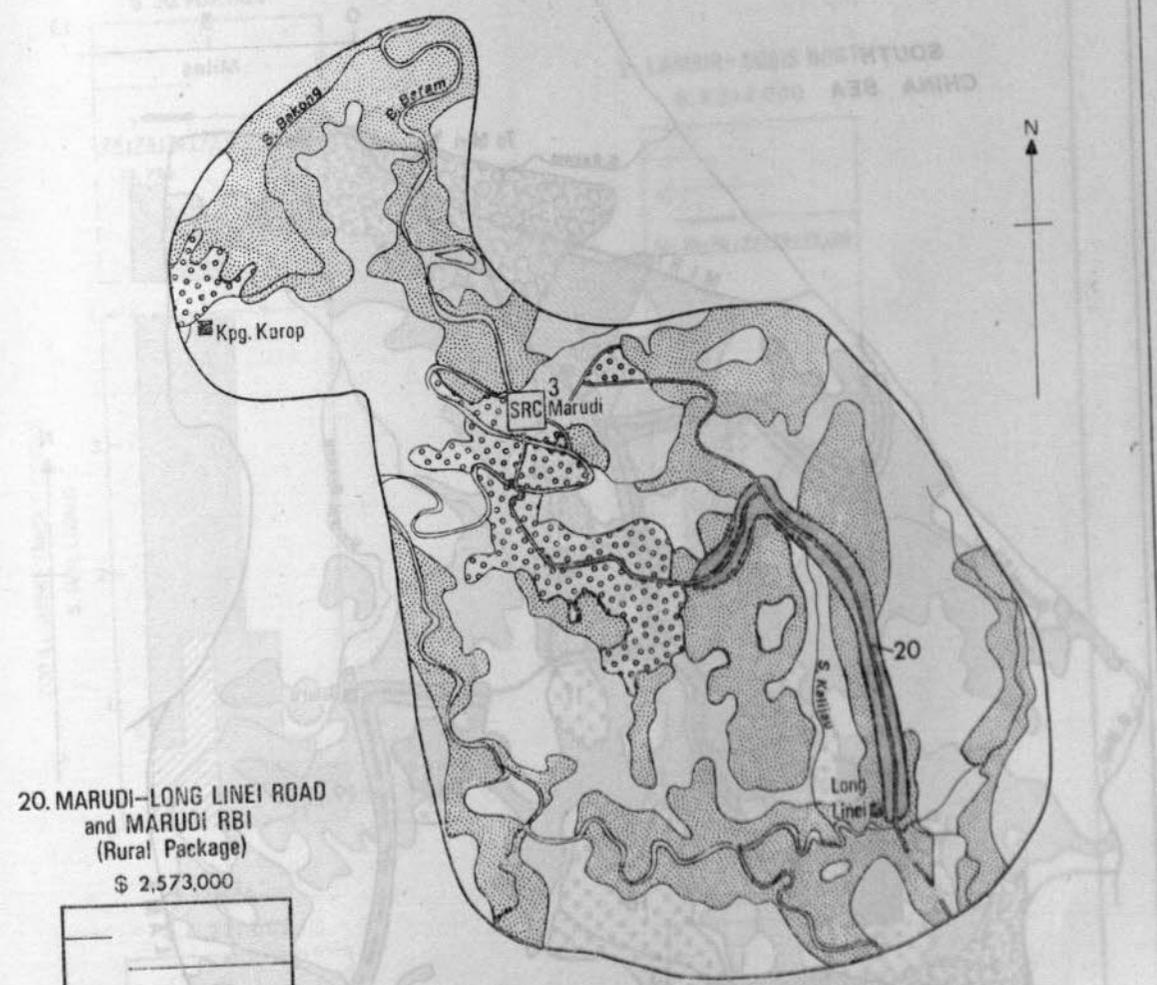
Operating Costs

The Action Programme Projects would involve an increase in operating costs within all sectors. For the public sectors the total increase in recurrent expenditures is calculated at \$50 mn in the AP-period. Recurrent expenditures are public consumption plus transfers which are, for instance, emergency relief and pensions to disabled and old people. Because transfers will constitute only a small amount in the Study Area recurrent expenditures and public consumption can be considered practically identical. Thus the \$50 mn should be compared to the assumed (Section 2.4) increase in public consumption of \$57 mn over the same period. Consequently—if the assumptions become reality, the \$57 mn available for public consumption should be sufficient to cover also unforeseen increases in addition to the Action Programme.

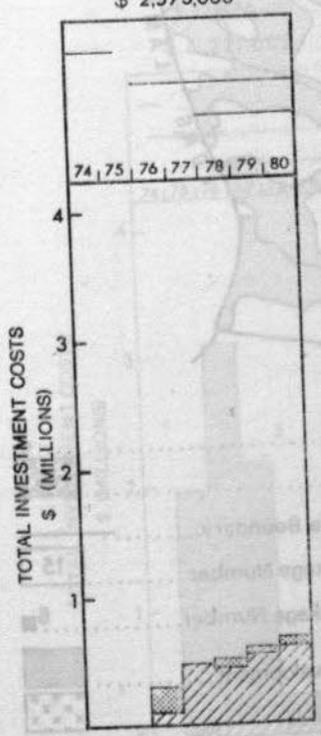
DEVELOPMENT PACKAGES-MIRI RDA



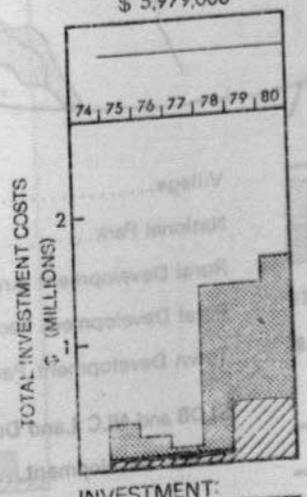
DEVELOPMENT PACKAGES — MARUDI RDA



20. MARUDI—LONG LINE1 ROAD and MARUDI RBI (Rural Package)
\$ 2,573,000



3. MARUDI (Town Package)
\$ 5,979,000

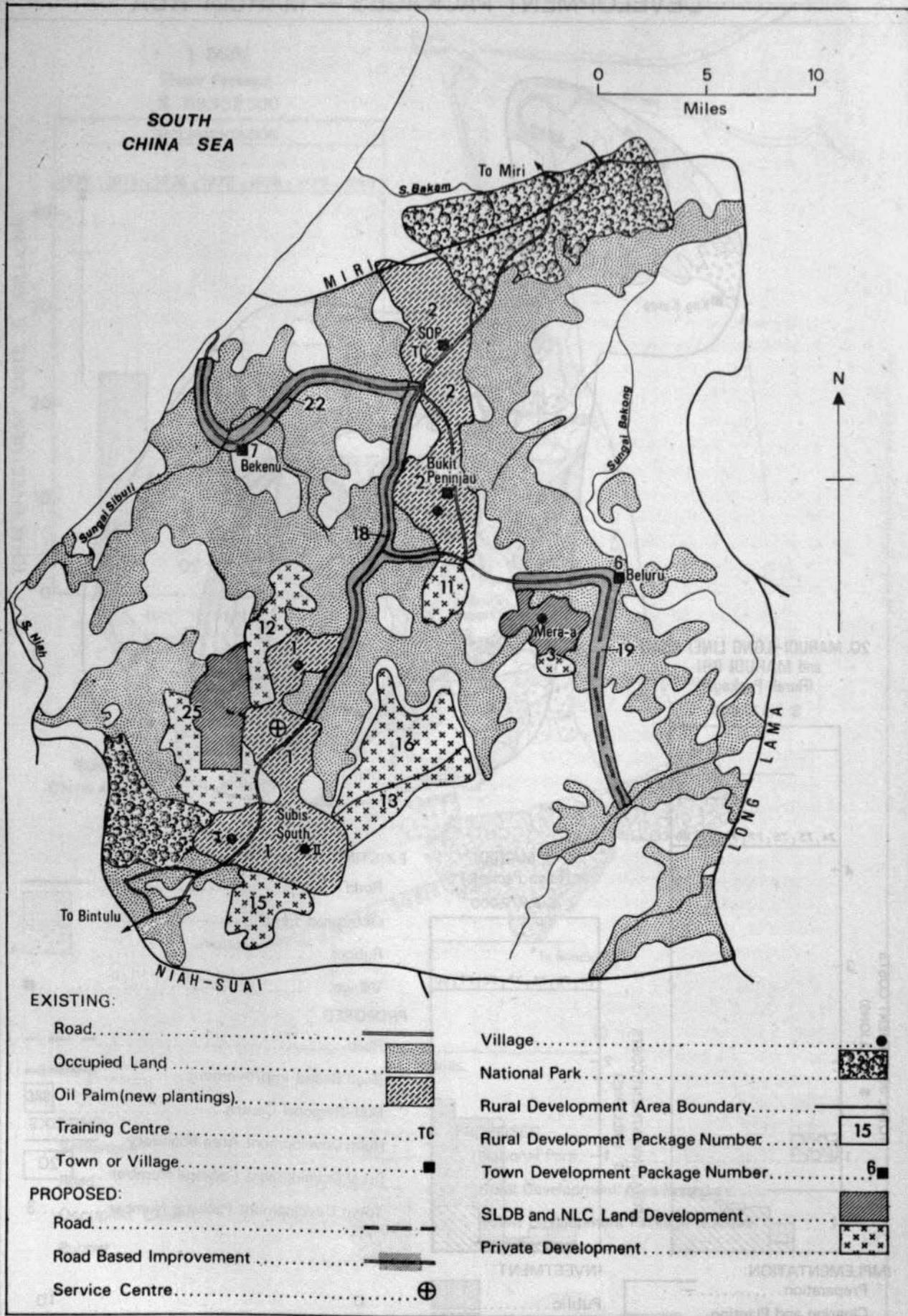


- EXISTING:**
- Road
 - Occupied Land
 - Rubber
 - Village
- PROPOSED:**
- Road
 - Road Based Improvement
 - Sub-Regional Centre
 - Rural Development Area Boundary
 - Rural Development Package Number
 - Town Development Package Number

- IMPLEMENTATION:**
- Preparation
 - Clearing and Planting
 - Infrastructure
- INVESTMENT:**
- Public
 - Private

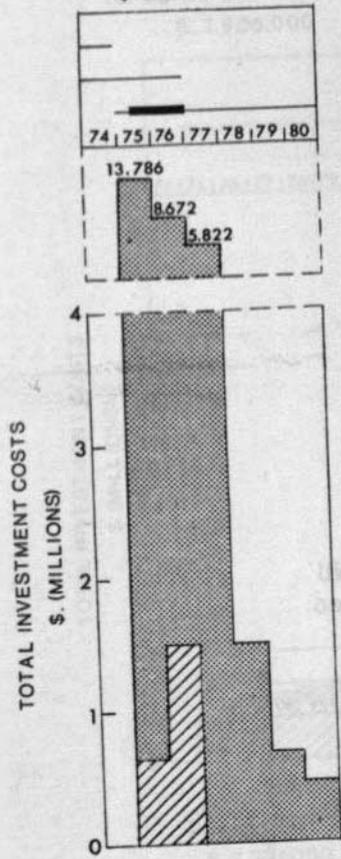


DEVELOPMENT PACKAGES — LAMBIR SUBIS RDA

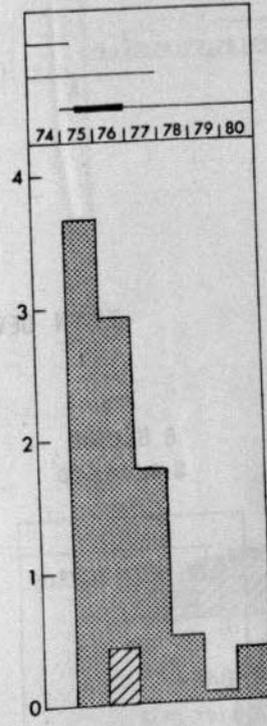


RURAL DEVELOPMENT PACKAGES

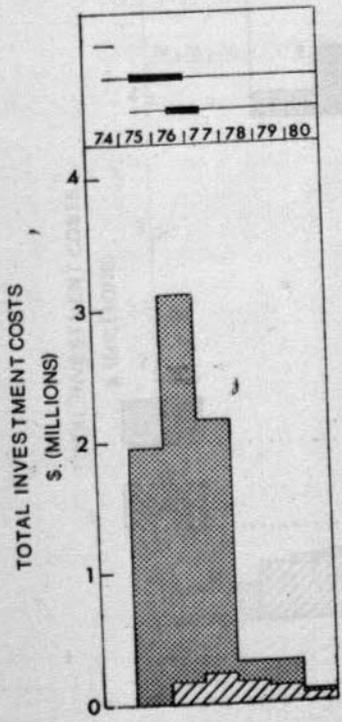
1. LAMBIR - SUBIS SOUTH
\$ 30,909,000



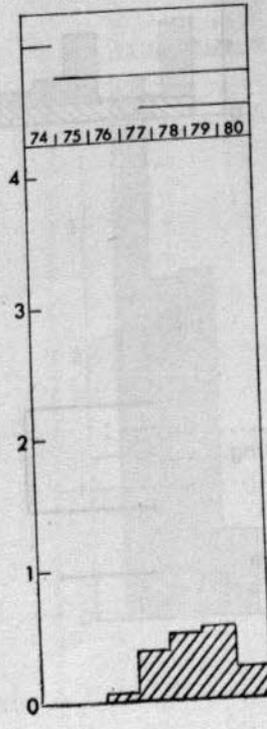
2. LAMBIR - SUBIS NORTH
\$ 9,344,000



3. MERA-A
\$ 6,221,000



11. ULU MAMAT
\$ 1,749,000

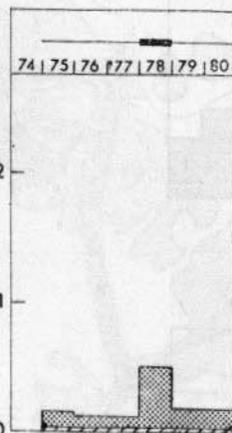
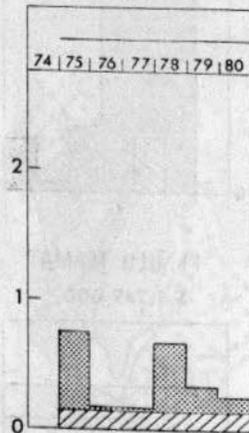


LAMBIR-SUBIS DEVELOPMENT AREA-INVESTMENT COSTS 1974-1980

TOWN DEVELOPMENT PACKAGES

6. BELURU
\$ 2,379,000

7. BEKENU
\$ 1,315,000



IMPLEMENTATION:

- Preparation.....
- Clearing and Planting.....
- Infrastructure.....

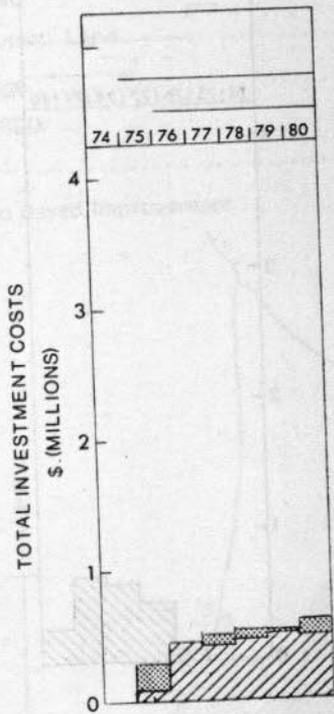
Period of Maximum Activity

INVESTMENT:

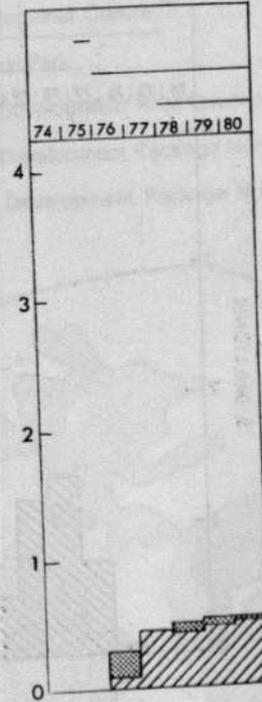
- Public.....
- Private.....

RURAL DEVELOPMENT PACKAGES

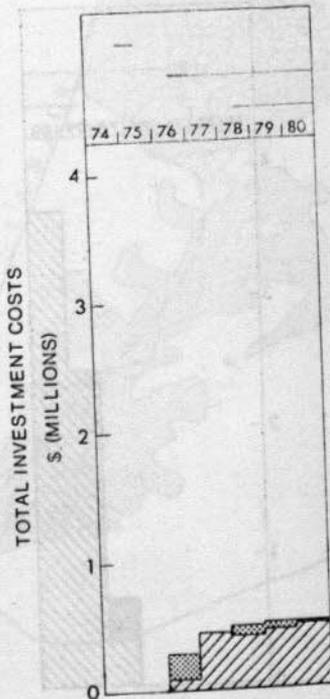
18. BUKIT PENINJAU RBI
\$ 2,906,000



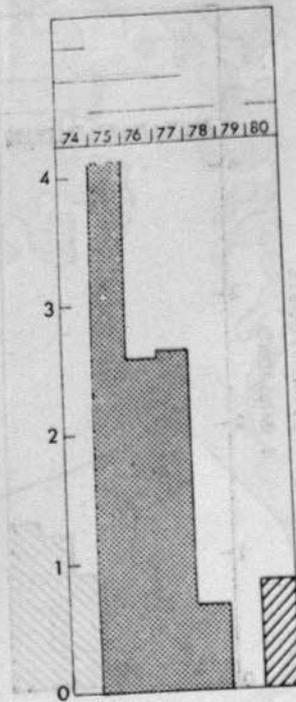
19. BELURU RBI
\$ 2,321,000



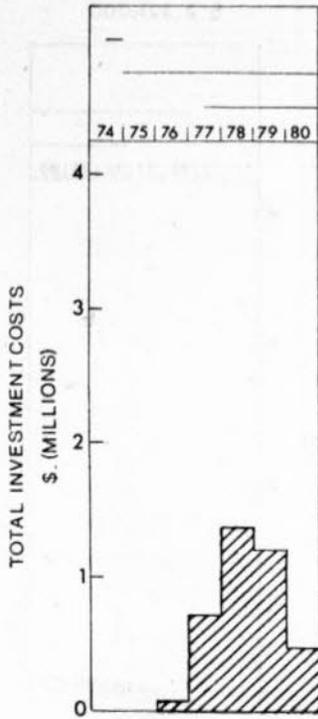
22. BEKENU RBI
\$ 2,321,000



25. KARABUNGAN
\$ 10,791,000

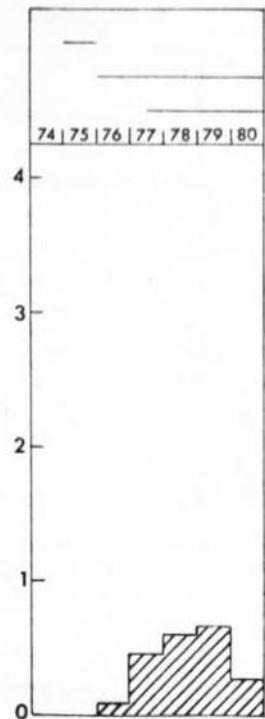


12. MENANTAN
\$3,838,000

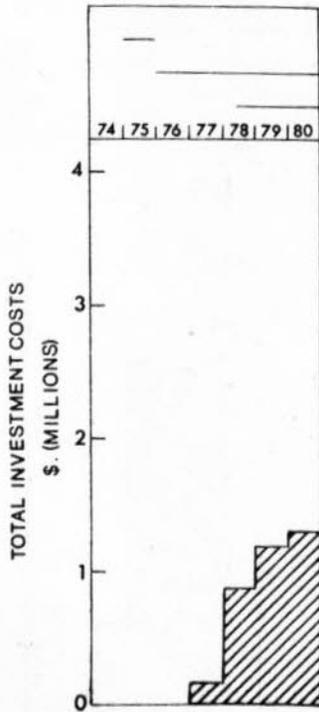


RURAL
DEVELOPMENT
PACKAGES

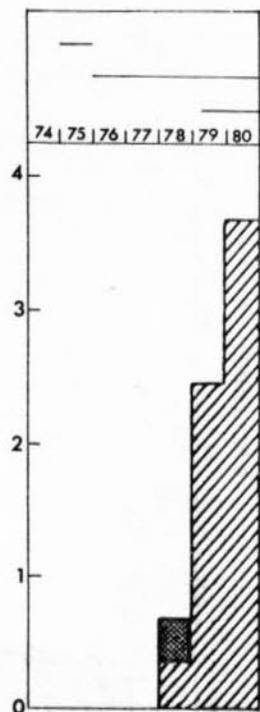
13. ULU KLAD
\$2,059,000



15. ULU MASIAT
\$3,537,000



16. SUNGAI KLAD
\$6,819,000



DEVELOPMENT PACKAGES — LONG LAMA RDA

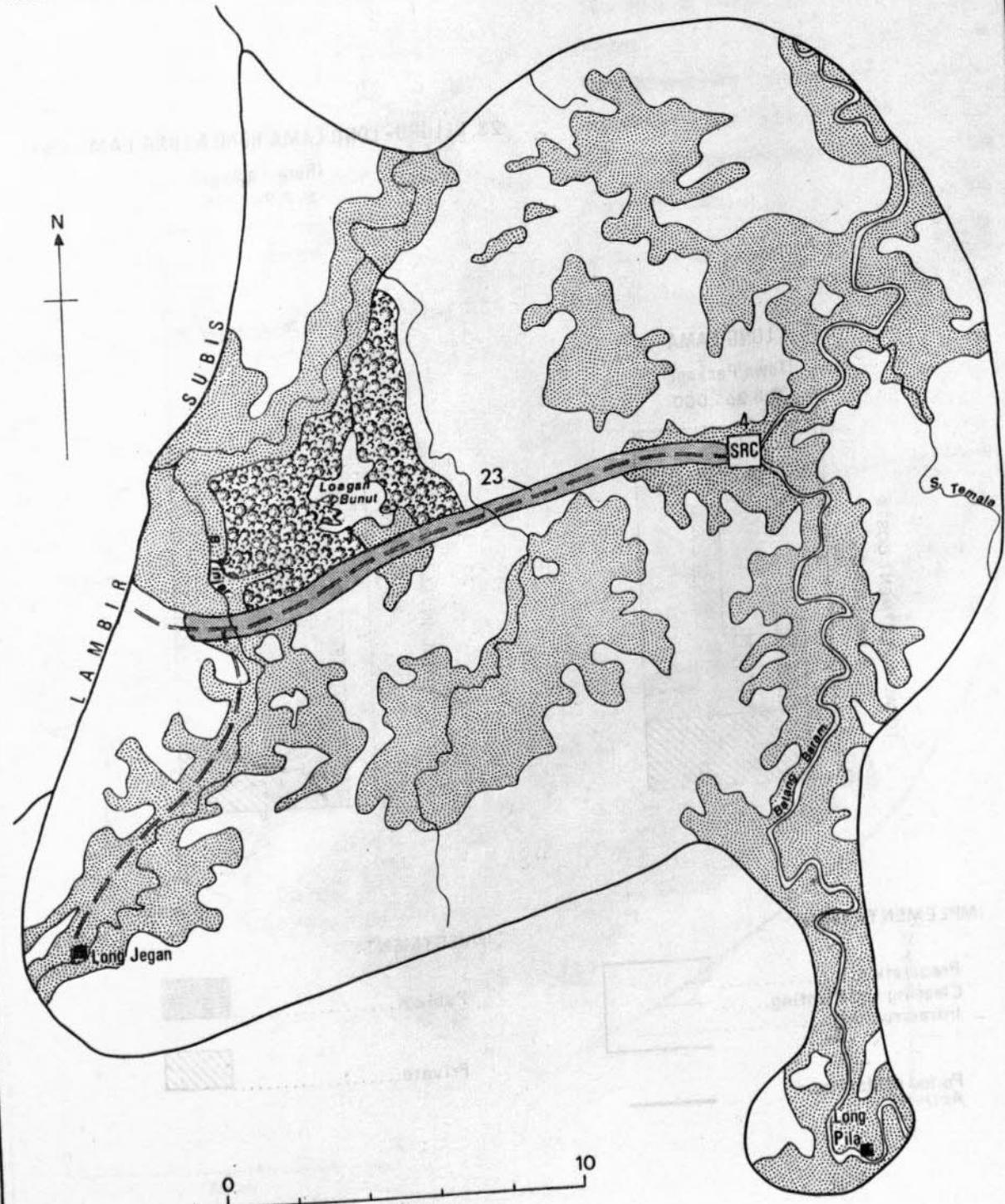
EXISTING:

- Occupied Land
- Village

PROPOSED:

- Road
- Road Based Improvement

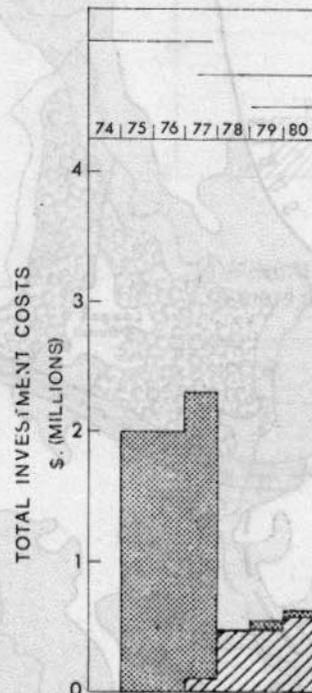
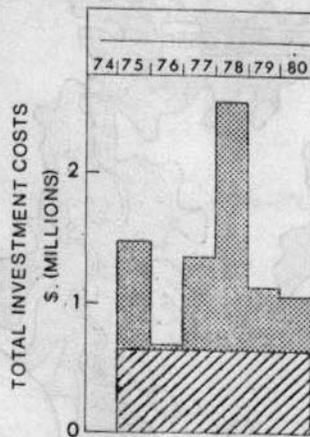
- Sub-Regional Centre
- National Park
- Rural Development Area Boundary
- Rural Development Package Number
- Town Development Package Number



LONG LAMA DEVELOPMENT AREA-INVESTMENT COSTS 1974-1980

23. BELURU-LONG LAMA ROAD & LONG LAMA RBI (Rural Package) \$. 7,947,000

4. LONG LAMA (Town Package) \$. 8,265,000



IMPLEMENTATION:

- Preparation.....
- Clearing and Planting.....
- Infrastructure.....

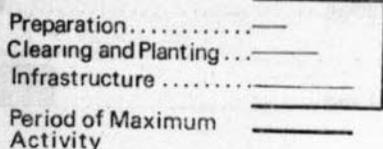
Period of Maximum Activity

INVESTMENT:

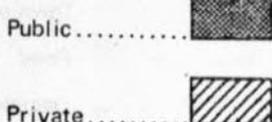
- Public.....
- Private.....

NIAH-SUAI DEVELOPMENT AREA-INVESTMENT COSTS 1974-1980

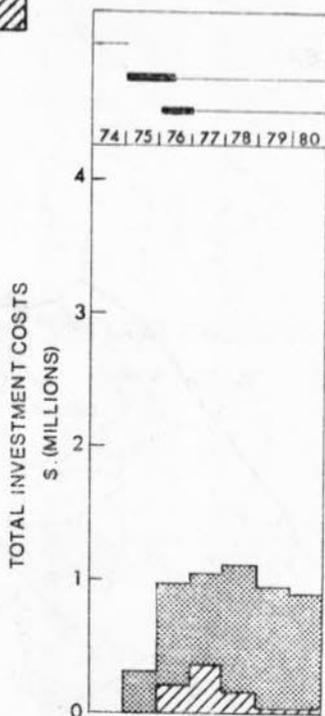
IMPLEMENTATION:



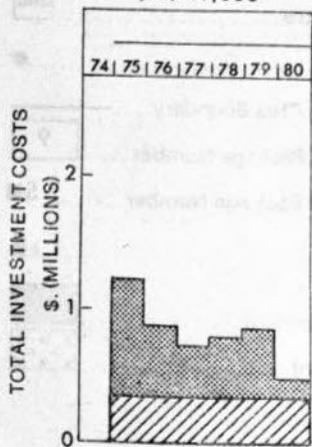
INVESTMENT:



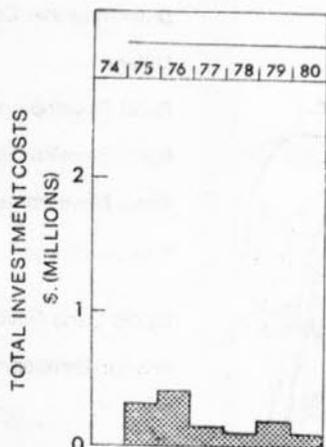
4. SEPUPOK & BATU NIAH RBI
 (Rural Package)
 \$ 5,295,000



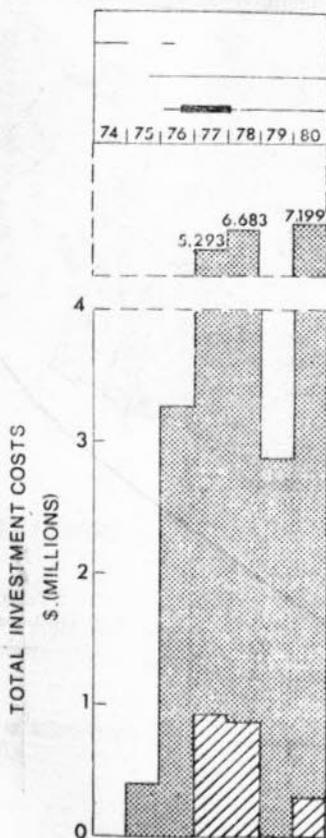
5. BATU NIAH
 (Town Package)
 \$ 4,987,000



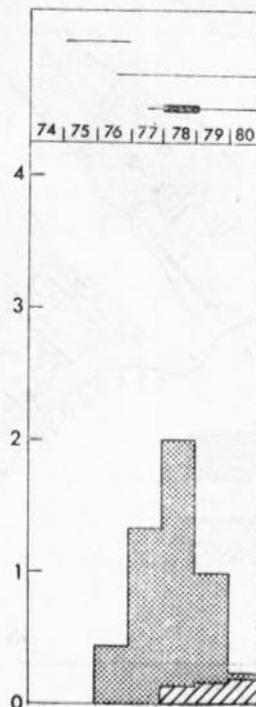
8. NIAH
 \$ 1,213,000



5. IGANG ESTATE
 (Rural Package)
 \$ 25,722,000

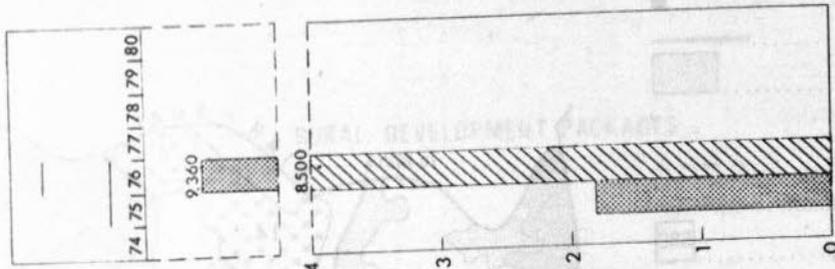


6. GALASAH
 (Rural Package)
 \$ 5,015,000

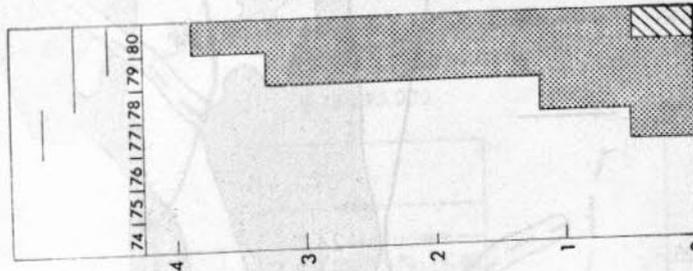


RURAL DEVELOPMENT PACKAGES

28. SUAI TIMBER COMPLEX (UNIT.3)
\$ 11,160,000



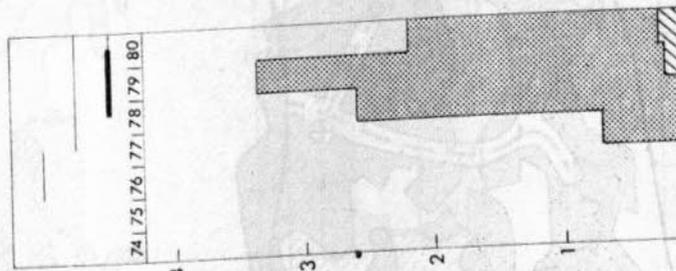
9. ENSABANG
\$ 8,856,000



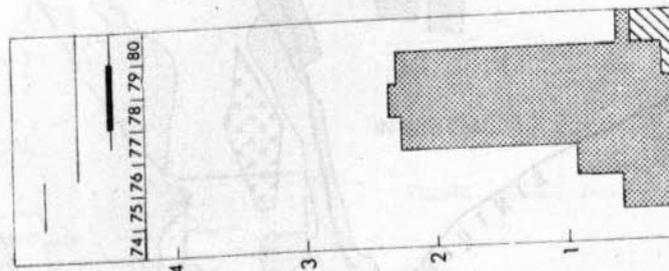
10. TELABIT
\$ 1,695,000



8. LAMAUS
\$ 8,877,000



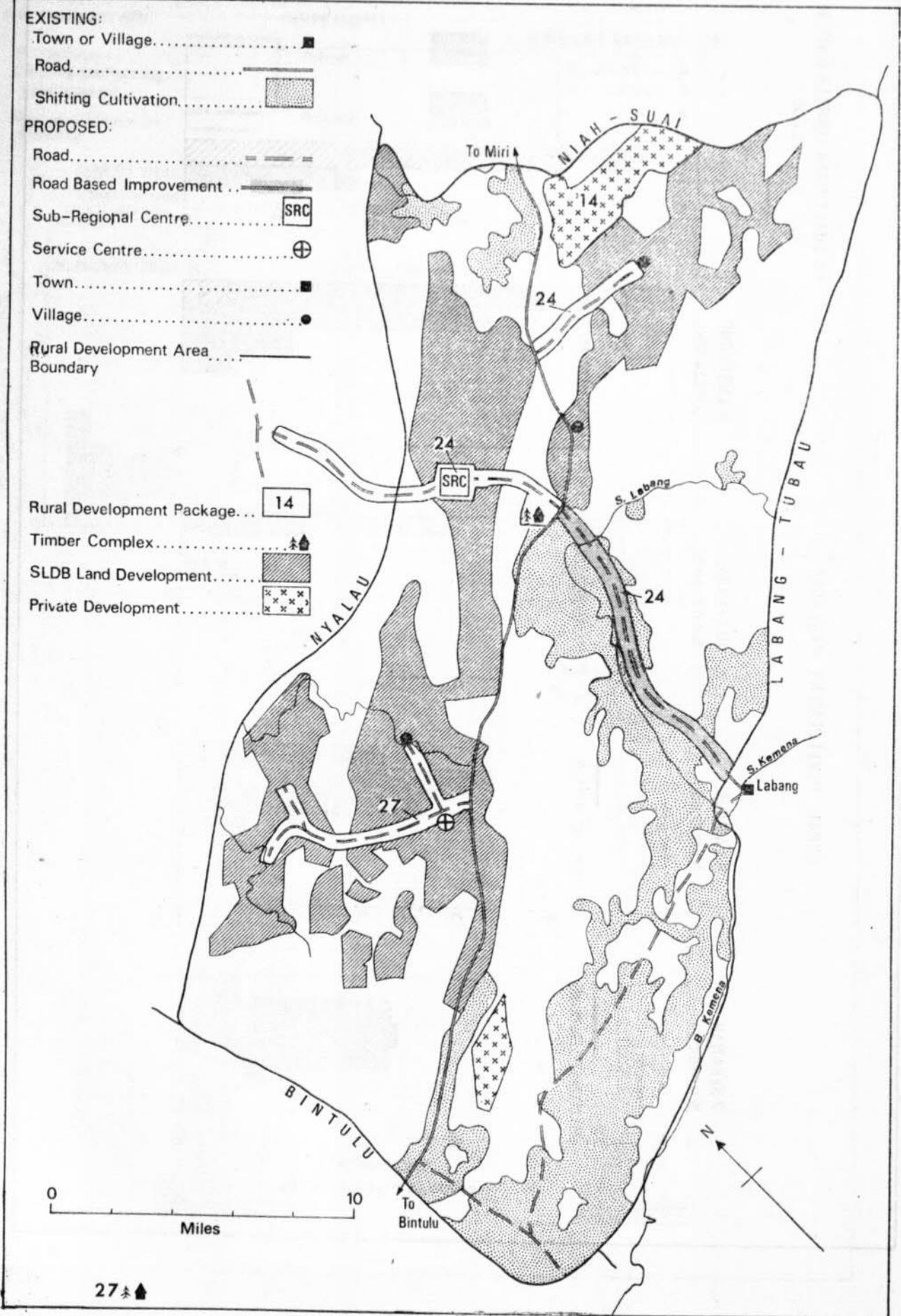
7. SEBAMAH
\$ 9,080,000



TOTAL INVESTMENT COSTS
\$ (MILLIONS)

DEVELOPMENT PACKAGES – SEKUDONG RDA

FIGURE 3-13



27 [tree icon]

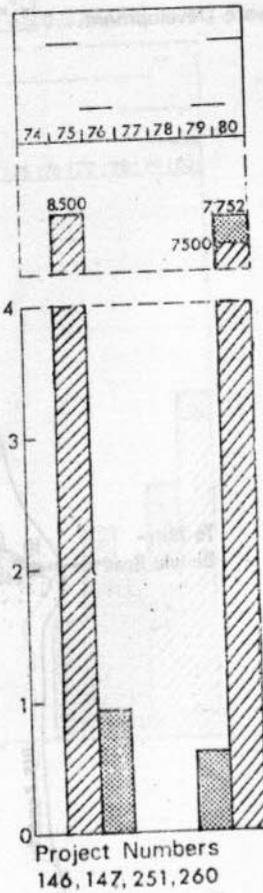
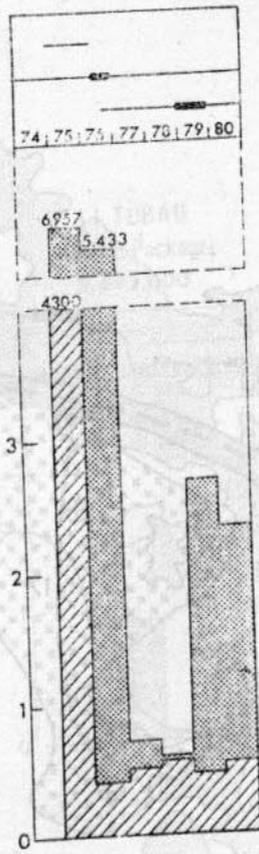
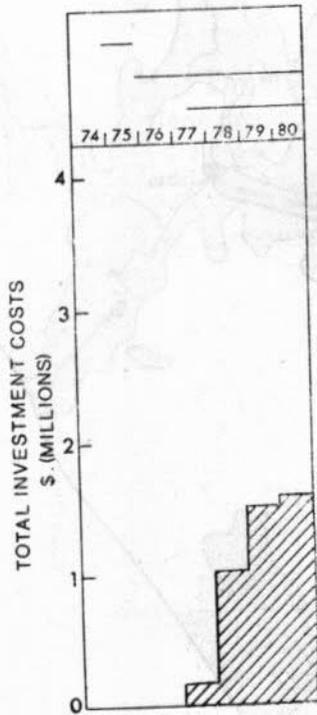
SEKUDONG DEVELOPMENT AREA - INVESTMENT COSTS 1974-1980

RURAL DEVELOPMENT PACKAGES

24. LABANG ROAD & TIMBER COMPLEX
& LABANG RBI
\$ 18,695,000

27. BINTULU TIMBER
COMPLEX (UNIT.1)
\$ 17,788,000

14. MAJAM
\$ 4,243,000



IMPLEMENTATION:

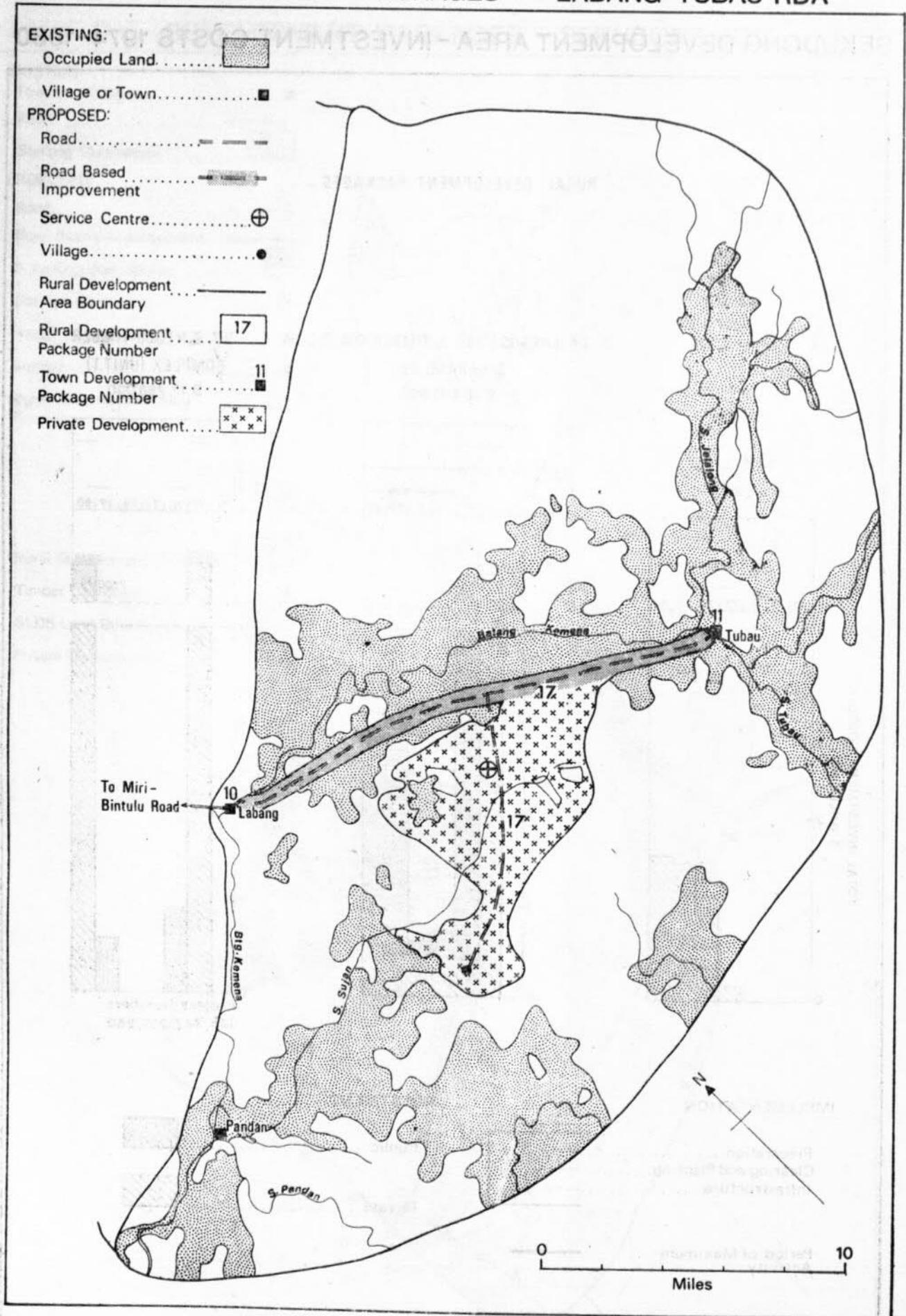
- Preparation.....
- Clearing and Planting.....
- Infrastructure.....

Period of Maximum Activity

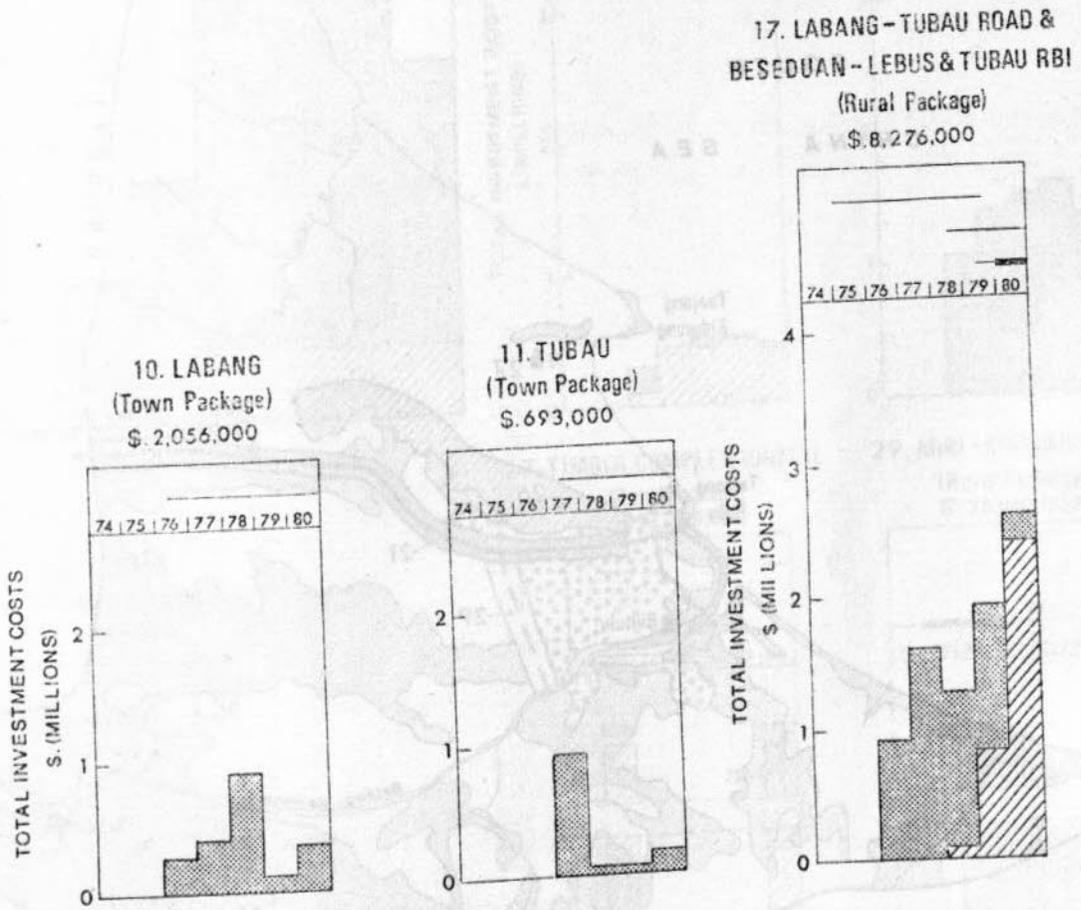
INVESTMENT:

- Public.....
- Private.....

DEVELOPMENT PACKAGES — LABANG-TUBAU RDA



LABANG-TUBAU DEVELOPMENT AREA - INVESTMENT COSTS 1974-1980



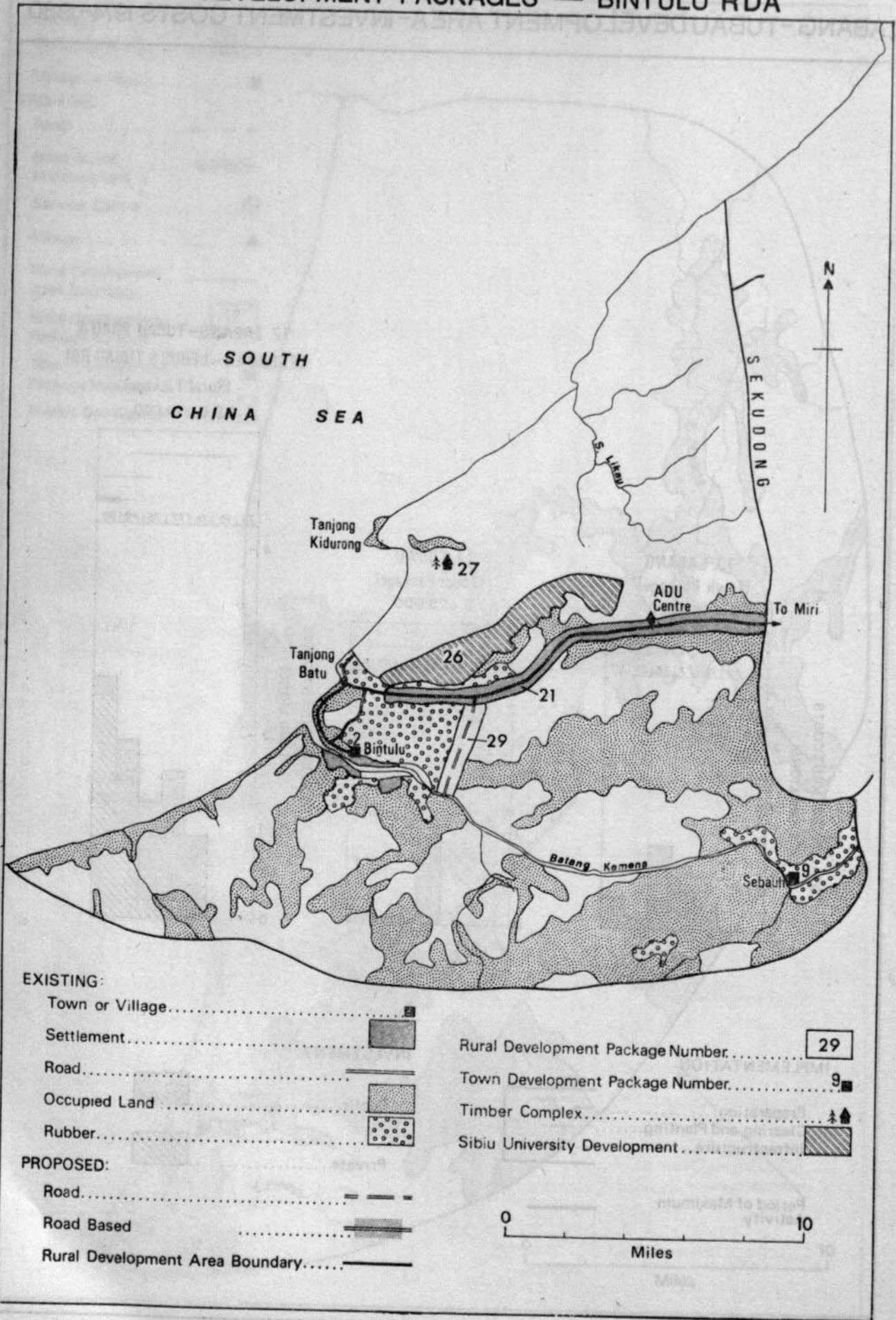
IMPLEMENTATION:

- Preparation.....
- Clearing and Planting.....
- Infrastructure.....

Period of Maximum Activity

INVESTMENT:

- Public.....
- Private.....



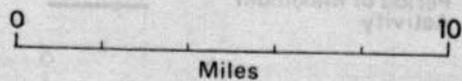
EXISTING:

- Town or Village.....
- Settlement.....
- Road.....
- Occupied Land.....
- Rubber.....

- Rural Development Package Number..... 29
- Town Development Package Number..... 9
- Timber Complex.....
- Sibi University Development.....

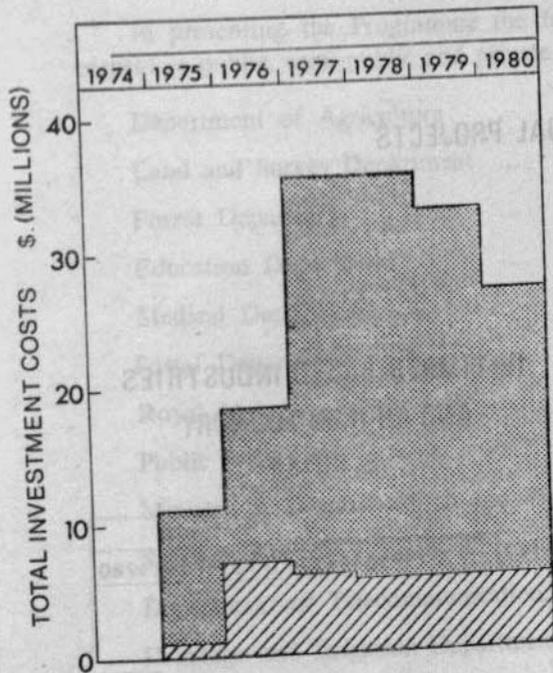
PROPOSED:

- Road.....
- Road Based.....
- Rural Development Area Boundary.....

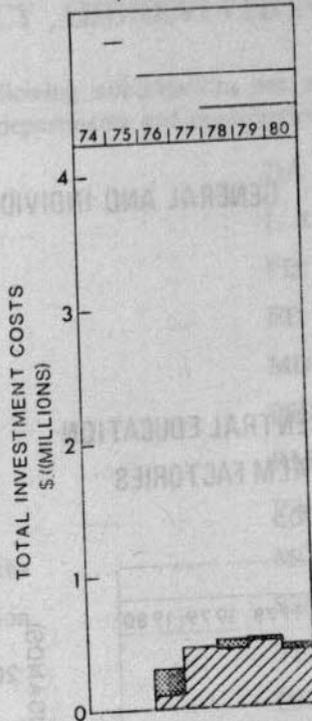


BINTULU DEVELOPMENT AREA - INVESTMENT COSTS 1974-1980

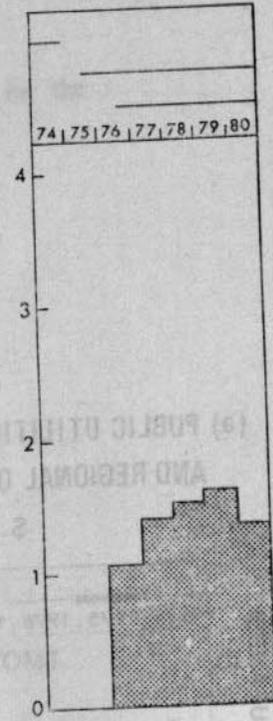
2. BINTULU
(Town Package)
\$.160,563,000



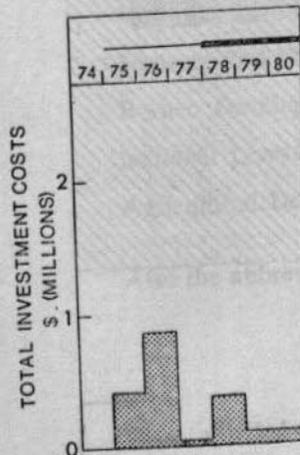
21. 10th MILE ROAD RBI
(Rural Package)
\$.2,255,000



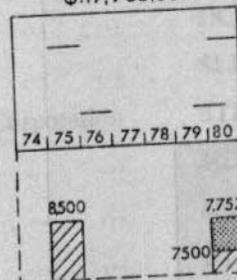
26. UNIVERSITY (SIBIU)
(Rural Package)
\$.6,971,000



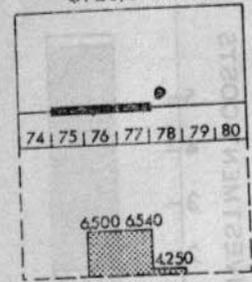
9. SEBAUH
(Town Package)
\$.1,878,000



27. TIMBER COMPLEX (UNIT.1)
(Rural Package)
\$.17,788,000

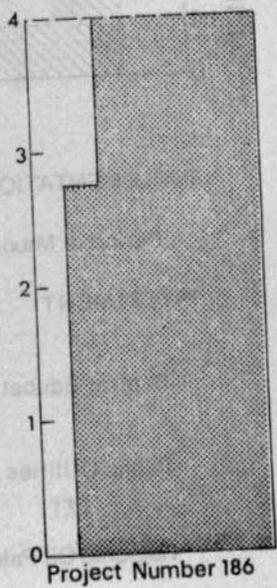
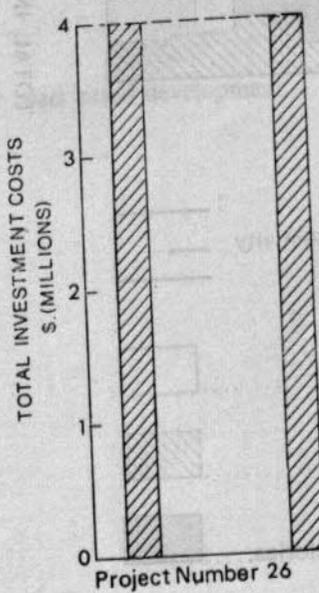


29. MIRI - BINTULU ROAD
(Rural Package)
\$.28,040,000



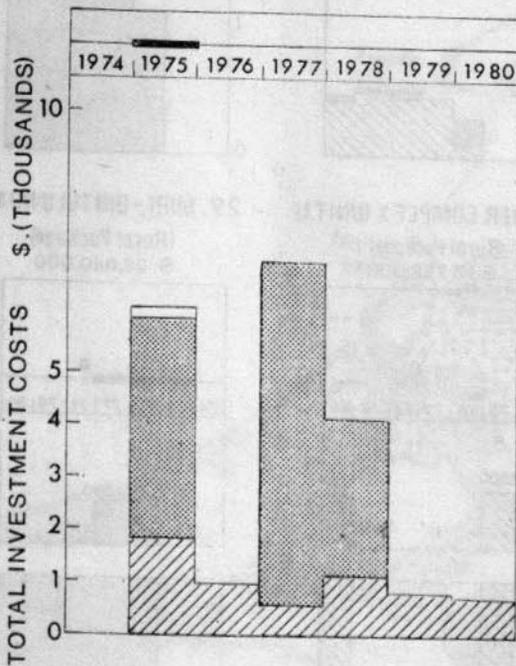
IMPLEMENTATION :
 Period of Maximum Activity.....
 Preparation.....
 Clearing and Planting.....
 Infrastructure.....

INVESTMENT :
 Public.....
 Private.....



GENERAL AND INDIVIDUAL PROJECTS

(a) PUBLIC UTILITIES, CENTRAL EDUCATION AND REGIONAL OIL PALM FACTORIES
\$. 21,005



IMPLEMENTATION:

Period of Maximum Activity

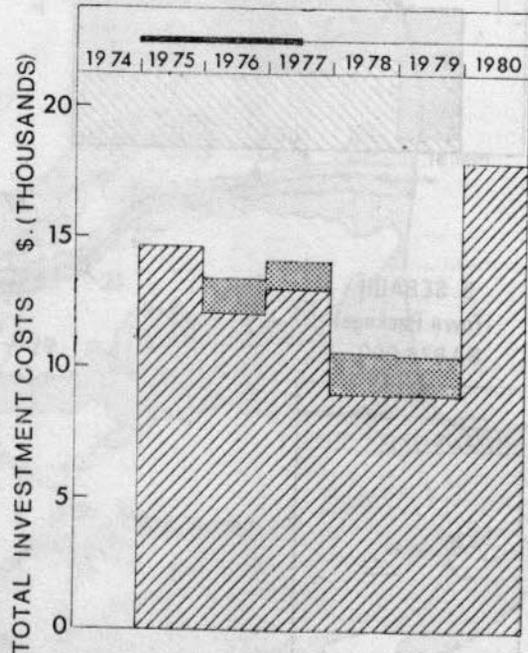
INVESTMENT:

Central Education.....

Public Utilities.....

Regional Oil Palm Factories.....

(b) TIMBER BASED INDUSTRIES AND AN IRON FOUNDRY
\$. 81,155



IMPLEMENTATION:

Period of Maximum Activity

INVESTMENT:

Public.....

Private.....

GLOSSARY OF AGENCY ABBREVIATIONS

In presenting the Programme the following abbreviations are used for the respective public, semi-public and private departments and organisations:

Department of Agriculture	...	...	...	...	DA
Land and Survey Department	...	...	...	...	L & SD
Forest Department	...	...	...	...	FD
Education Department	...	...	...	...	ED
Medical Department	...	...	...	...	MD
Postal Department	...	...	...	...	PSD
Royal Malaysia Police	...	...	...	...	RMP
Public Works Department	...	...	...	...	PWD
Ministry of Communication and Works	...	...	...	...	MCW
Sarawak Electricity Supply Corporation	...	...	...	...	SESCO
Department of Telecommunication	...	...	...	...	TELECOMS
Drainage and Irrigation Department	...	...	...	...	DID
State Planning Unit	...	...	...	...	SPU
Residents Office	...	...	...	...	R & DO
District Council	...	...	...	...	DC
Sarawak Land Development Board	...	...	...	...	SLDB
Sarawak Timber Industry Development Corporation	...	...	...	...	STIDC
Housing and Development Corporation	...	...	...	...	HDC
Borneo Development Corporation	...	...	...	...	BDC
National Livestock Corporation	...	...	...	...	NLC
Agricultural Development Unit	...	...	...	...	ADU

Also the abbreviation RBD is used for road based development.

MIRI - BINTULU REGIONAL PLANNING STUDY
 GOVERNMENT OF MALAYSIA AND STATE OF SARAWAK

THE ACTION PROGRAMME

AGRICULTURE

- Settlement Agencies - SLDB
- Private Development
- Existing Occupied Land
- Road Based Improvement
- Existing Development Schemes

SETTLEMENTS

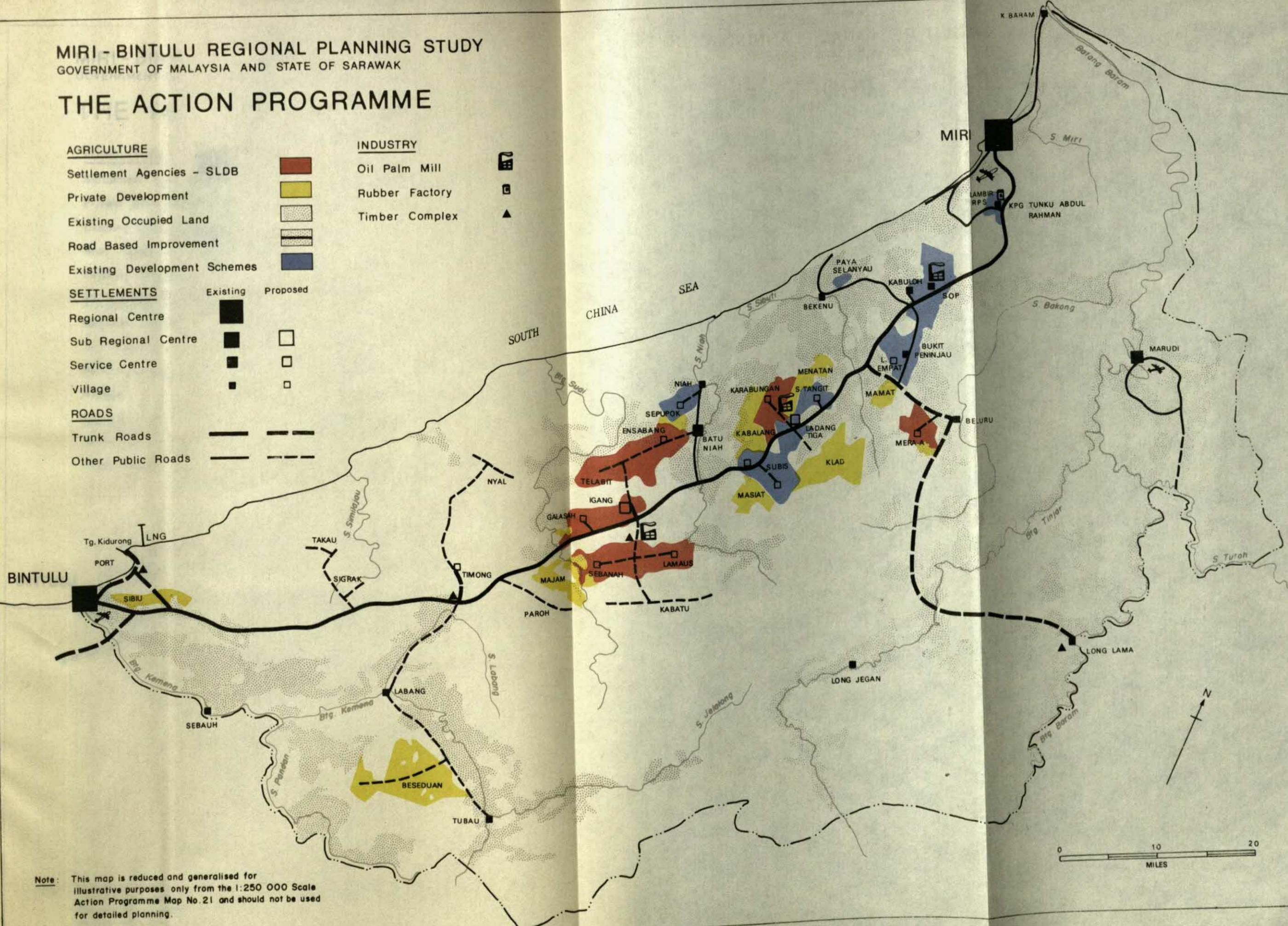
- | | Existing | Proposed |
|---------------------|---|--|
| Regional Centre | | |
| Sub Regional Centre | | |
| Service Centre | | |
| Village | | |

ROADS

- Trunk Roads
- Other Public Roads

INDUSTRY

- Oil Palm Mill
- Rubber Factory
- Timber Complex



Note: This map is reduced and generalised for illustrative purposes only from the 1:250 000 Scale Action Programme Map No. 21 and should not be used for detailed planning.

