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THE GOVERNMENTS OF MALAYSIA AND STATE OF SARAWAK

**MIRI—BINTULU**  
**REGIONAL PLANNING STUDY**

**SUMMARY REPORT**

MALAYSIA-227E

Map one Location of the study area

THE GOVERNMENTS OF MALAYSIA AND STATE OF SARAWAK

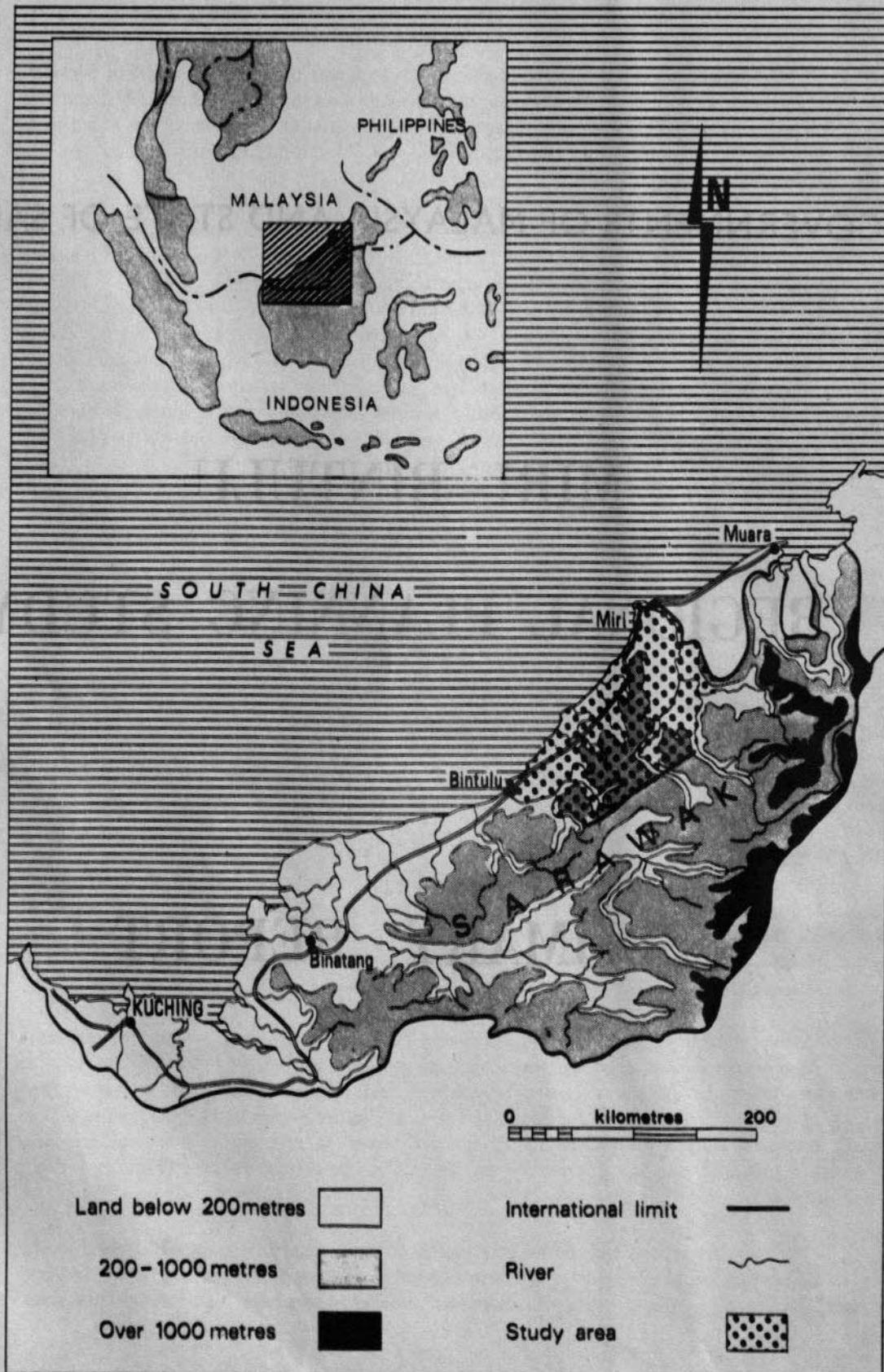
MIRI—BINTULU

REGIONAL PLANNING STUDY

SUMMARY REPORT



Map one Location of the study area



**SARAWAK**  
**MIRI-BINTULU REGIONAL PLANNING STUDY**  
**A SUMMARY**

The preparation of a development plan for a large part of the 4th Division of Sarawak was commissioned jointly by the Malaysian and Sarawak Governments in April 1972 and the work was finished two years later. The plan itself and the studies on which it was based have been fully described in the Final Report presented by the Consultants who carried out the investigations and planning.

The area for which the plan was required is about 3.5 million acres, extending inland from the coast between Miri and Bintulu (Map 1). Roughly 80 per cent of the area is under forest, part of it already exploited for log export, and agriculture consists mainly of shifting cultivation under hill rice with some scattered rubber and pepper gardens. There are however the beginnings of organised settlement for oil palm production in the Lambir Subis Development area. The exploitation of off-shore oil and natural gas has stimulated urban expansion in Miri and together with possibilities of larger timber exports has created great interest in the prospects of a port near Bintulu; but the rural population is widely scattered in traditional settlements whose distribution is determined by river access and a very restricted road system.

In commissioning the preparation of a development plan the Governments recognised the potential of the area, which has a high year-round rainfall (100-200 inches), vast forest resources, and considerable areas suitable for selective agricultural use. The wise utilisation and development of these resources, coupled with that of the off-shore mineral deposits, offered prospects of considerable industrial development and prosperity for a population far exceeding present numbers (115,000 in 1970).

The plan was to be based on agriculture and forestry and the settlement of people from any part of the State where conditions are such that people are not able to make a reasonable living. Diversification away from the present heavy reliance on rubber and pepper was desirable and the processing of agricultural and forestry produce would be important features in a general expansion of manufacturing industries and services, both public and private.

The Governments prescribed that the planning procedure should go through phases designed to identify broad zones for development and the general perspective in which it should take place. The final plan itself was to be in two parts; an integrated Regional Plan covering the whole 3.5 million acres over a twenty year period and an Action Programme of specific projects for the settlement of about 50,000 acres in the first six years of the Regional Plan.

The preliminary period of data gathering covered the physical features of soil and terrain, the appraisal of economic and market prospects of various feasible agricultural enterprises, the study of manufacturing possibilities and the whole range of socio-economic aspects of employment, settlement patterns and services for people. In all this the results of the recent inventory made by UNDP/FAO of 630,000 acres of reserved and protected mixed dipterocarp forests in the Study Area and the formulation of plans for their utilisation were of major importance.

The physical studies led to the preparation of land capability maps which emphasised the steep, broken nature of much of the terrain and the shallow depth and indifferent fertility of most of the soils. The consequent susceptibility to erosion under high rainfall intensities

imposes severe constraints on possible patterns of agriculture. But on the other hand two thirds of the forests inventoried by FAO were pronounced as being of "high volume density". It was evident from all these studies, as indeed it was to the Governments commissioning them, that transport communications would be critical in developing these resources and that the restraint of shifting cultivation would be crucial in preventing their destruction.

## THE REGIONAL PLAN

It is axiomatic that development based on the sustained use of natural resources must be ecologically sound. For this reason the Plan provides for the protection under forest of all river catchments and the steeper slopes. A result is that the area under official forest protection is increased by  $\frac{1}{2}$  m acres from 38 per cent of the total at present to 51 per cent, and the total protection of seven areas of special ecological or wild-life importance is recommended in the form of nature reserves or national parks. (Map 2).

Environmental considerations effectively limit the choice of large scale agricultural activities to plantation crops such as oil palms, rubber, cocoa and to grassland for livestock. But there are several optional agricultural systems available, from high disciplined public estates, through a range of private enterprises on various scales down to individual smallholdings. The Plan provides for all these, having much in mind the natural desire of many potential settlers to identify themselves with a piece of land and to manage it. Opportunity is given to people with capital and the necessary skill to open up and operate private farms, while employment opportunities are provided on large estates for those who wish to work as labourers. The existing population in legally occupied areas is catered for by providing intensive guidance and assistance in organised settlement close to existing roads or new planned roads within the main areas of present occupation. This is called road-based improvement. For persons illegally occupying land recommendations are made for their inclusion into the planned settlement schemes.

Again, in the rural settlement patterns several options exist involving various combinations of towns and villages. The Plan, amending slightly the present policy of the Sarawak Land Development Board (SLDB) proposes a limited number of relatively large centres each associated with several interdependent satellite villages. This pattern permits the modernisation of rural life by facilitating the provision of certain urban services and amenities and access to more diversified employment.

The Plan aims to use existing infrastructure and investments to their optimum capacity, and to give priority to the development of the more accessible resources. Thus development will start in areas accessible to the Miri-Bintulu road and in the urban growth poles of the terminal towns themselves. It will subsequently expand into remoter areas as communications are extended and processing and port facilities are improved to handle their products.

The physical structure of the Plan divides the region into 9 Rural Development Areas (RDA), each a composite geographical unit whose size is determined by physical, organisational, processing and management factors (Map 3). Though capable of a large measure of independent development, RDAs are generally mutually supporting in a balanced regional context with a network of communications linking them with the port sites at Bintulu and Miri.

In each RDA the Plan aims to concentrate development around an existing nucleus

**MIRI - BINTULU**  
**GOVERNMENT OF MALAYSIA**  
**THE REGIONAL PLAN**

**AGRICULTURE**

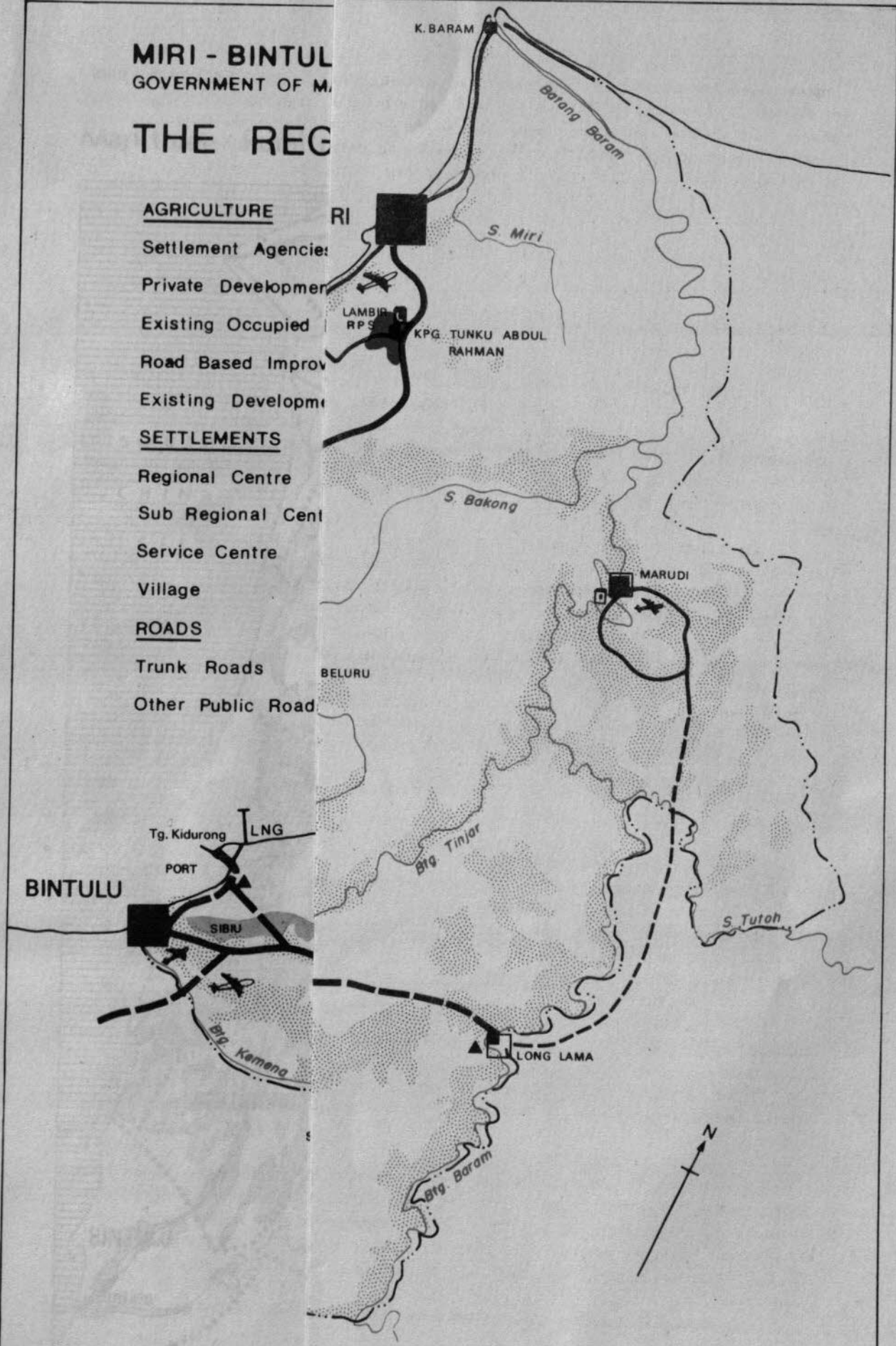
- Settlement Agencies
- Private Development
- Existing Occupied
- Road Based Improvement
- Existing Development

**SETTLEMENTS**

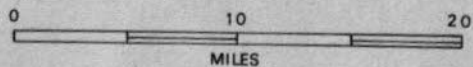
- Regional Centre
- Sub Regional Centre
- Service Centre
- Village

**ROADS**

- Trunk Roads
- Other Public Road



**Note:** This map is reduced and illustrative purposes only.  
**Regional Plan Map No. 2:** detailed planning.



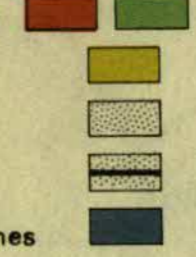
**MIRI - BINTULU REGIONAL PLANNING STUDY**  
 GOVERNMENT OF MALAYSIA AND STATE OF SARAWAK

**THE REGIONAL PLAN**

**AGRICULTURE**

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

1974-80 1981-90



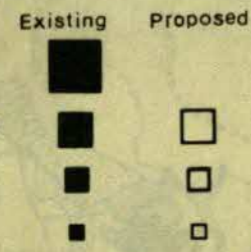
**INDUSTRY**

- Oil Palm Mill
- Rubber Factory
- Timber Complex



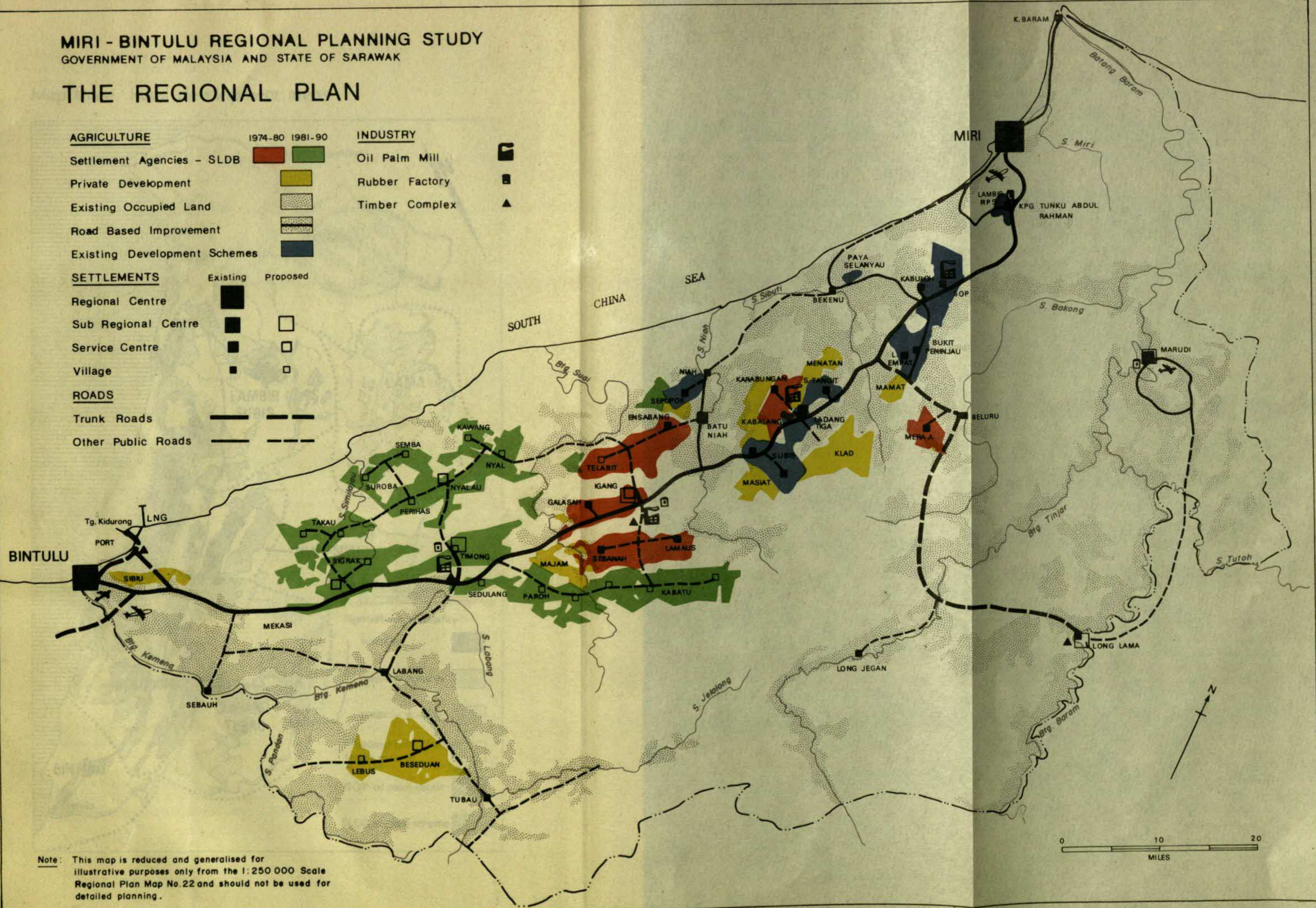
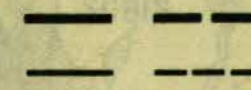
**SETTLEMENTS**

- Regional Centre
- Sub Regional Centre
- Service Centre
- Village



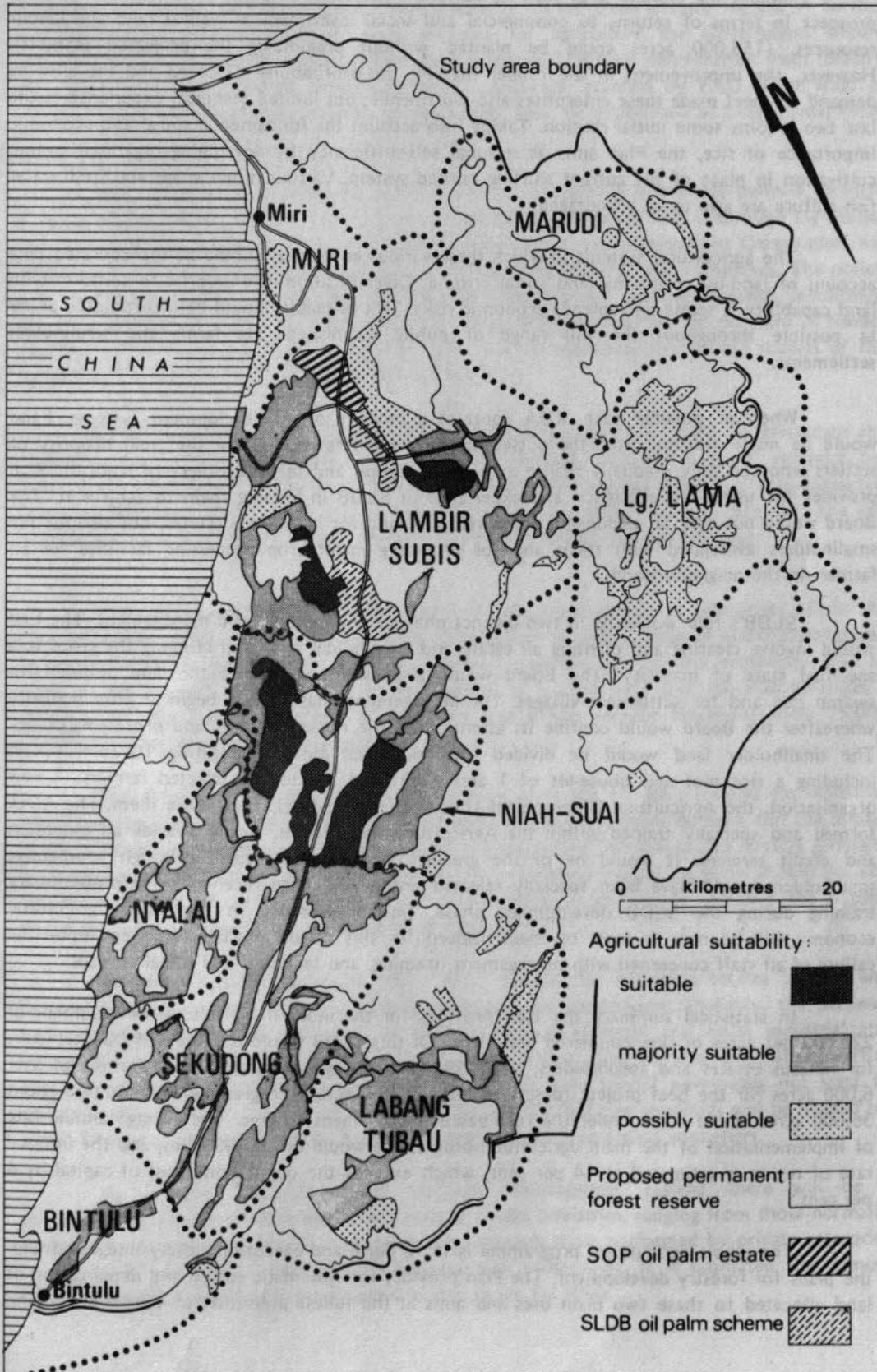
**ROADS**

- Trunk Roads
- Other Public Roads



Note: This map is reduced and generalised for illustrative purposes only from the 1:250 000 Scale Regional Plan Map No.22 and should not be used for detailed planning.

Map three Rural development areas



enterprise or to create one for the purpose. Thus in the Miri, Marudi, Lambir Subis and Bintulu RDAs agricultural progress will be oriented towards either supplying the growing urban markets or reinforcing the established estates.

Among the feasible large scale agricultural enterprises, oil palms are the most attractive prospect in terms of returns to commercial and social investment as well as land and labour resources. (155,000 acres could be planted without prejudicing the projected markets). However, the improvement in the rubber market, the profitability of cocoa and the growing demand for beef made these enterprises also worthwhile; but limited technical experience in the last two enjoins some initial caution. Taking into account the fundamental social and economic importance of rice, the Plan aims at regional self-sufficiency by developing organised swamp cultivation in place of the current shifting rainfed system. Various minor crops and fresh-water fish culture are also to be encouraged.

The agricultural systems in which these various enterprises should be incorporated take account of land-use, economic and social criteria. Diversification of enterprise to conform with land capability is sound and spreads economic risks. This principle should be incorporated as far as possible throughout the full range of public estates, private farms and smallholder settlements.

Wherever possible each RDA contains a mixture of all development systems. Land would be made available from the outset for private enterprise, but for the great majority of settlers who can only gradually realise an aim to occupy and manage a piece of land, the Plan provides for using the efficiency and experience of SLDB in helping them to achieve it. The Board would not only be responsible for developing land for its nucleus estates, but also for the smallholders associated with them and for providing major crop processing facilities for all farmers in the neighbourhood.

SLDB's role would be in two distinct phases - development and management. The first would involve clearing and planting all estate and smallholder land and bringing the crops to a specified state of maturity. The Board would also clear and prepare the land destined for swamp rice and for settlement villages. The Management phase would begin at crop maturity whereafter the Board would confine its attention to the nucleus estates, and processing plants. The smallholder land would be divided into individual plots (aggregating 16 to 17 acres including a rice plot and house-lot of 1 acre each) and allotted to selected farmers. A new organisation, the Agricultural Development Unit (ADU) would help and advise them. The ADU, formed and specially trained within the Agricultural Department, would provide all extension and credit services. It would be of the greatest importance because, although prospective smallholders would have been specially selected and would have received some probationary training during the SLDB development phase, settled existence in a modern agricultural economy will be new to most of them. Indeed for this reason much will depend upon the calibre of all staff concerned with management, training, and technical and social services.

In statistical summary the Plan provides for the modern agricultural development of 225,000 net acres of unencumbered State land. Of this SLDB would develop 155,000 net acres for nucleus estates and smallholders, some 59,000 acres would be in private farms and over 6,000 acres for the beef project (described later in the Action Programme). In addition about 36,000 acres would come under the road-based improvement scheme. The average annual rate of implementation of the main agricultural programme would be 10,000 acres, and the internal rate of return is estimated at 14 per cent, which exceeds the opportunity cost of capital by 4 per cent.

The whole agricultural programme is in its form and execution closely integrated with the plans for forestry development. The Plan provides for systematic survey and demarcation of land allocated to these two main uses and aims at the fullest utilisation of timber from land

scheduled for agriculture. There is a particular significance in "maximum exploitation" on such land because of the early revenue to be derived from timber in a development process based largely on long term crops with a delayed economic return. It is recommended that the possibility of using mixed residual trees for the chipping market be urgently explored. The problem of implementing this integrated agricultural and forestry policy in the Plan is eased somewhat by siting early agricultural development in forest areas already logged. A further recommendation is that in forest areas destined for agriculture the Government should construct the permanent main roads before logging begins. The main contribution from forestry will come from the three big forest 'industrial complexes' planned by FAO to be sited at Bintulu, Igang and Sekudong (a fourth complex may later be established at Long Lama) (Map 4).

The forest units are designed, as far as present silvicultural knowledge permits, to yield a steady phased production over a 25 year harvesting period and to feed it through big timber saw mills and processing plants. The Sarawak Timber Industrial Development Corporation has recently been formed to facilitate and control the establishment of the complexes. The policy aims at high efficiency utilisation, employing modern plant for making plywood, mouldings, etc. in gradual substitution for log exports which currently account for 80 per cent of timber harvested. It will be appreciated from the map that an important key to the success of the future forest industry is a deepwater port near Bintulu.

Of no less importance, though in a different direction, is the need to strengthen the research and organisational capacity of the Forest Department, since the economic prospects for forestry are impressive. In the years up to 1980 alone the average volume of logs extracted from the Plan area is estimated at one million tons Hoppus with a value of \$90 mn. The net revenue would average over \$ 50 mn, yielding royalties of about \$10 mn per year.

Although agriculture and forestry and their associated processing enterprises will be the main industries of the region, the Plan aims to stimulate as wide a range of manufacturing and service activities as possible in order to improve economic balance and prosperity, and to increase and diversify employment. In this context it is significant that the Plan envisages a doubling of the local population in 20 years and would include absorbing some 75,000 immigrants from other parts of Sarawak.

The Regional Plan does not deal specifically with the off-shore oil and gas industries which are the particular concern of the Government and Sarawak Shell Berhard, but the impact of these industries on the size and location of manufacturing, commerce and services generally is clearly important. Oil off Miri and proposals for a liquified natural gas plant at Bintulu, and the possibility of cheap fuel which these developments offer, greatly enhance the natural advantages of these two towns as industrial growth poles.

The Plan includes proposals and outline designs for industrial estates in Miri and Bintulu and recommends that the existing machinery of Government (notably, the Sarawak Economic Development Corporation) be strengthened to promote and assist industrial and commercial development at all levels. By these several means a considerable range of enterprises could be developed. Wood-based manufactures clearly have special advantages not least in satisfying the enormous increase in demand for houses: 20,000 new dwellings will be needed by 1985. There are also opportunities for iron foundry products and glass containers.

As primary production and industrial development expand there will be a corresponding growth of both public and private service industries, ranging from those normally provided by Government (health, education, etc.) through those performed by private enterprise in wholesale and retail trade, general business and professions. It is estimated that almost 13,000 additional people will be absorbed in this sector by 1990.

Throughout the Plan the dependence of development on adequate infrastructure is stressed. Not only are transport communications and port facilities obviously essential for exploiting the physical resources, but the interest and active participation of the people cannot be sustained without the public services and amenities on which modern society relies.

As an indication of the commercial part to be played by the transport system, agricultural exports alone will rise from about 8,000 tons in 1970 to between 400,000 and 500,000 in 1990; forest products may approach double this figure and imports will increase four or five times. The Public Works Department (PWD) will play a major part, and it is to be hoped that the port studies commissioned by the Government at Bintulu and Miri will reveal good prospects of efficient terminals for this essential communications network.

The infrastructure services for people in the rural areas are geared to the pattern of small towns, service centres and satellite villages proposed. The urbanisation makes it both desirable and necessary to have safe and dependable water supplies, sewerage, electricity and telecommunications. The Plan provides for these, and also sets out a structure of public services (health, education, posts, police and government administration) operating at different levels in the different communities, but facilitating access by all to each through a public bus service.

An important aspect of the recommendations for this 'urbanisation of the rural areas' is that the SLDB labour and staff required for opening up and operating specified areas as public estates should be housed within one urban area. This creates as quickly as possible a concentrated population sufficiently large to warrant a high order Service Centre catering also for the associated nearby villages occupied by smallholders and private farmers.

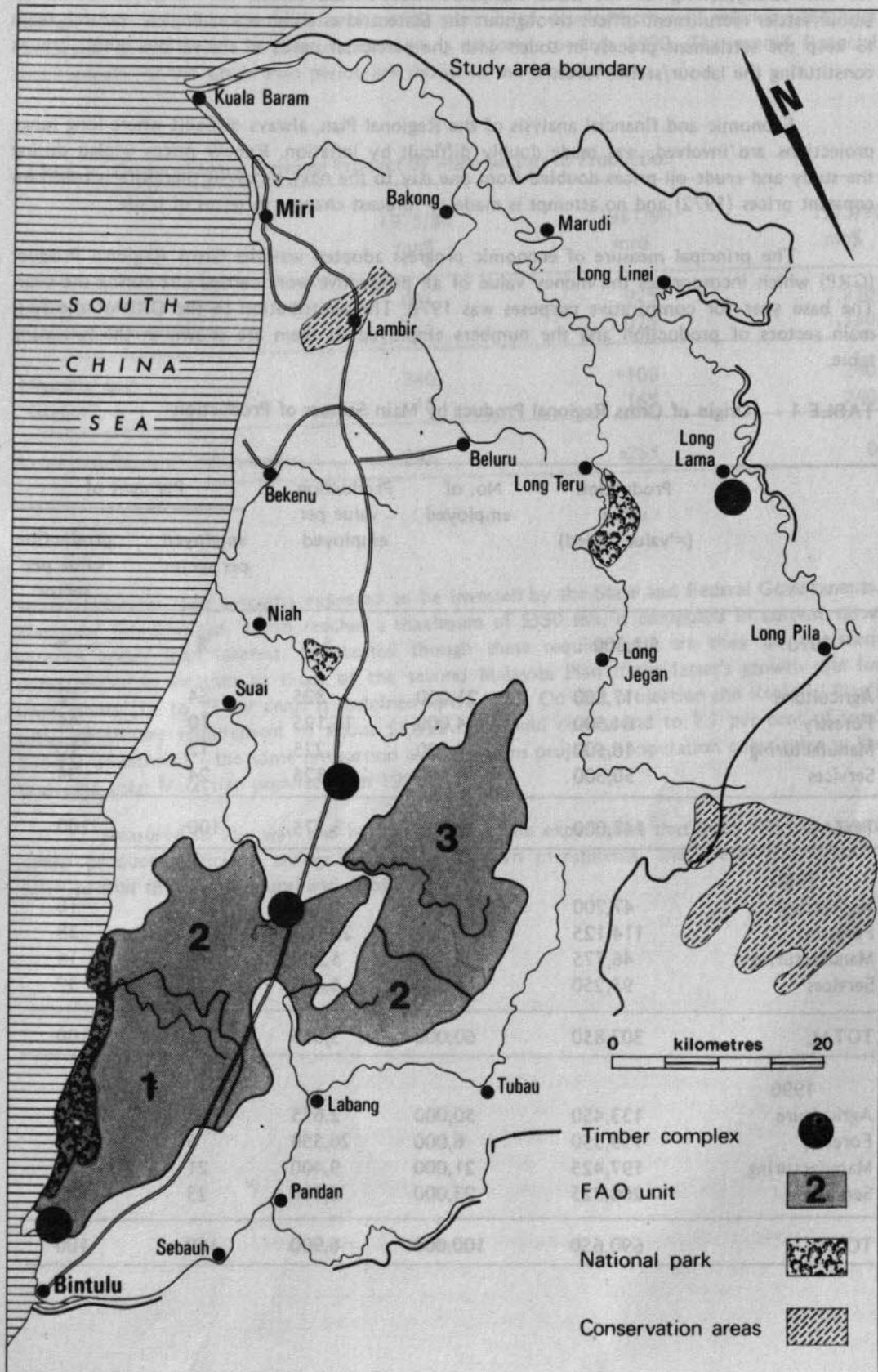
In addition to good services, the Plan gives prominence to satisfactory housing. Projected incomes indicate that, initially at any rate, over 60 per cent of demand will be in the 'low' or 'lower middle' income groups where houses costing between \$ 4,500 and \$9,000 will be needed. Over 8,000 such houses will be needed in the first six years, and only a highly efficient industry could fulfil these requirements. The Plan recommends industrial production of prefabricated wooden buildings, the whole drive for lower construction costs being stimulated by more active participation by the Housing and Development Commission in the building industry.

In a large, complex, integrated plan of this kind the organisation for planning and development is clearly crucial. The basic recommendation is to build on the existing machinery of Government in preference to creating a special regional development authority. A suitable organisational Government structure already exists: to create a new one would involve extra expense, stretch the demand for experienced personnel and weaken the capacity, authority and morale of existing Government services. But to cope adequately with the substantial new responsibilities of regional development may require some reinforcement of the present structure.

Coordination of the efforts of all concerned at all levels is the essence of achieving integrated development. The existence of the State Planning Unit (SPU) and the Government's intention to form the Implementation and Coordination Unit (ICU) provide the necessary top level authority. At Divisional level it is recommended that the coordinating authority of the Resident, as chairman of the Divisional Action Committee (DAC), be strengthened by making the secretary (the Administrative Officer, Planning and Development) a member of the ICU with direct access to it. The aim must be to generate united action and a team spirit among the different departmental members comprising the DAC.

The Plan contains three further suggestions for improving the control of regional development. One is for a monitoring section to be established in the ICU. Another is for some

Map four Proposed forest industrial complexes



ministerial reorganisation to bring SLDB into the Ministry of Agriculture, so that all agricultural agencies may be coordinated, and to make the Ministry of Lands and Mineral Resources responsible for overall physical planning, including the broad classification of land and the location of major land development activities. The third particular organisational suggestion is for the strengthening of the State Manpower Section sufficiently to enable it to set up labour/settler recruitment offices throughout the State and establish a sociological research team to keep the settlement process in touch with the particular needs of the various ethnic groups constituting the labour/settler force.

Economic and financial analysis of the Regional Plan, always difficult where long range projections are involved, was made doubly difficult by inflation. Rubber prices tripled during the study and crude oil prices doubled from one day to the next. Analysis therefore is based on constant prices (1972) and no attempt is made to forecast changes in terms of trade.

The principal measure of economic progress adopted was the Gross Regional Product (GRP) which incorporates the money value of all productive work carried out during the year. The base year for comparative purposes was 1970. The contribution to the GRP of the four main sectors of production and the numbers employed in them are shown in the following table.

**TABLE 1** 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
1970	\$ 1,000		\$	%	%
Agriculture	17,500	21,000	825	54	12
Forestry	64,500	4,000	16,125	10	44
Manufacturing	16,500	4,500	3,225	12	10
Services	50,500	9,500	5,325	24	34
<b>TOTAL</b>	<b>147,000</b>	<b>39,000</b>	<b>3,775</b>	<b>100</b>	<b>100</b>
1980					
Agriculture	47,700	32,000	1,500	54	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
<b>TOTAL</b>	<b>303,850</b>	<b>60,000</b>	<b>5,050</b>	<b>100</b>	<b>100</b>
1990					
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
<b>TOTAL</b>	<b>690,650</b>	<b>100,000</b>	<b>6,900</b>	<b>100</b>	<b>100</b>

The figures show that agriculture and especially manufacturing (which includes timber processing) are expected to grow at rates above average due to increased employment and more efficient output from modernisation.

Analysis of the use of GRP over its main purposes - consumption, investment and savings - indicates that the early and middle periods of development will require substantial loans and grants before a surplus situation is restored towards 1990. The overall financial requirements for the whole Plan period are shown in the table below:-

**TABLE 2 Origin of Gross Regional Product by Main Sectors of Production**

	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 / repayments	265	+265	0

"Grants" are amounts expected to be invested by the State and Federal Governments. The total financial gap, which reaches a maximum of \$350 mn, is computed in current value without added loan interest. Substantial though these requirements are they do not seem unreasonable in relation to those of the second Malaysia Plan if the latter's growth rate for investments (12 to 13 per cent) is sustained up to 1985. On that projection the Regional Plan's total investment requirement of about \$1,000 mn would correspond to 1.7 per cent of total Federal investment - the same proportion as the regions projected population constitutes to the projected total Malaysian population in 1990.

Measured in this way and having regard to the expectation that from 1985 the region could produce sufficient savings to sustain its own investments, the overall conclusion is justified that the Plan is sound and viable.

## THE ACTION PROGRAMME (1975-1980)

The Action Programme consists of detailed proposals covering all sectors for the first six years of the Regional Plan, 1975-1980. This is not, however, a discrete plan period or phase of development, but only the start of a continuing process susceptible of adjustment and change.

The total Programme comprises over 500 separately defined activities conveniently grouped into 40 development packages for rural and urban progress. All have been fully costed in a phased sequence and ascribed to the agencies responsible for implementing them. The main ingredients of the packages are:-

Agricultural development in the public and private sectors, in road-based schemes and the beef project;

Forest exploitation on land schedules for release to agriculture;

Establishment of manufacturing industries, mainly wood-based;

Improvement and construction of rural and urban roads;

Construction and improvement of towns and villages, including housing, public services, and facilities.

Map 5 indicates the approximate location of the main land development and infrastructural features of the Programme.

Within the broad list of projects summarised above, some important components of them have been formulated into separate "investible packages" of possible interest to those wishing to assist. The salient features of ten of them are given below. Three are for agricultural development and seven for manufacturing industries.

### 1. Public Development of State Land for Estate and Smallholder Schemes

Basically the programme is for SLDB to continue to develop the agricultural land in Lambir Subis RDA and in forming a nucleus in Niah-Suai RDA. It will include approximately 36,000 net crop acres, of which two thirds will be for smallholders and nearly 70 per cent under oil palms. The estimated total annual value of production by the mid-'80s would be between \$ 22-27 mn, giving commercial and social rates of return of 8.5 per cent and 14.6 per cent respectively, earning a surplus of \$ 16 mn over a 25 year period.

### 2. Establishment of a foundation herd of beef cattle:

A joint programme of development and investigation at Karabungan in Lambir Subis RDA to establish a breeding herd of imported cross-bred Brahman cattle with a view to commercial beef production on a 5,000 acre ranch and the supply of store stock to estates, private farmers and smallholders for fattening. The National Livestock Corporation would run the project in concert with an Agricultural Department's adjoining 1,000 acre Livestock Production and Animal Husbandry Training Centre, which would be responsible for technical and economic investigations and the training and advice of smallholders. Capital costs are estimated at \$ 6.8 mn and the commercial rate of return at 8.9 per cent.

### 3. Road-based improvement and agriculture in legally occupied land

A programme for the training, equipping and operation of the new Agricultural Development Unit in connection with the settlement of some 2,500 shifting cultivators in

organised farming on about 40,000 acres astride 180 miles of roads linking intensive development areas. The project includes the establishment of the first divisional headquarters of ADU at Kabuloh in Lambir Subis RDA, a training centre for ADU specialist staff and their operational activities. The market value of the crops produced is estimated to rise to \$ 50 mn by 1990, giving a commercial return of 15.9 per cent and an internal rate of return of 17.7 per cent at social prices.

#### 4. Wood-based industries:

The industries outlined below are separate from, and smaller than, the big UNDP/FAO complexes, and can be developed in association with logging licence areas. All are capable of management and operation by Sarawak personnel and should be in the vicinity of Bintulu.

(i) *Sawmill*: Designed with a monthly log intake capacity of 2,500 tons derived over a 25 year harvesting period from 40 to 50,000 acres of Mixed Dipterocarp forest. Total capital cost is estimated at \$ 865 mn and annual operating costs at \$ 457,000. At 1971-73 prices cash flow shows net present value of over \$ 3 mn at 7 per cent discount rate and an internal rate of return of 22 per cent.

(ii) *Drying Kiln*: Though capable of separate economic existence this unit is visualised in association with the sawmill and a moulding plant. It would turn out 12,000 tons annually at 8-12 per cent moisture content. Assuming power supplied by the Sarawak Electricity Supply Corporation, capital costs would amount to \$ 350,000 and, operating in conjunction with other wood-based industries, annual costs would be almost \$ 100,000. With kiln dried timber prices ranging between \$ 260 per ton for mouldings and \$ 315 per export, the internal rate of return would be 20-25 per cent.

(iii) *Moulding plant*: Designed to produce high quality standard frames, fittings, dowels, etc. from kiln dried planks for both export and local markets (notably prefabricated housing). Capital costs are estimated at \$ 355,000 and annual operating costs (with separate administration) at \$ 537,000. Assuming constant price relationships the internal rate of return might be over 25 per cent.

(iv) *Timber impregnation plant*: Vacuum/pressure impregnation of plants, using anti-fungal salts to approved standards, mainly for local prefabricated housing. The capacity of the plant would be 5,000 tons sawn timber annually; capital cost \$227,000 and operating costs (in association with prefabrication of houses) \$192,000. On present price estimates an initial evaluation gives an internal rate of return of about 22 per cent.

(v) *Prefabricated housing plant*: A factory located alongside the impregnation plant for producing standardised modular house components for low income local demand. Factory capacity about 800 houses per year with a capital cost of \$405,000. Annual operating costs would include staff and labour at \$240,000 and timber and other raw materials at over \$2 mn. To obviate the impact of material cost fluctuations it is proposed that house prices be linked to a construction-cost index. On this basis, an internal rate of return of more than 25 per cent might be expected.

### 5. Iron Foundry:

A project to manufacture standard cast iron items for building and domestic use (sewage pipes, cooking utensils, etc.) and jobbing orders for the oil production industry, ship-building and general construction. Estimated demand indicates a foundry capacity of 1,500 tons per year, using scrap iron from disused oil drilling plant, and imported pig iron. Estimated costs have been based on using 300 tons of imported coke per year; but Lutong, savings could be made. Capital costs are estimated at \$ 750,000 and annual recurrent costs about \$ 800,000. On a reasonable assessment of prices a rate of return of more than 25 per cent might be achieved.

### 6. Glass container factory:

Although there is excess production capacity of glass in Peninsular Malaysia, no glass is manufactured in North Borneo despite the availability of silica-sand, the basic raw material. Commercial production, initially of bottles and later of other items, to meet an estimated demand of 20-30 tons per day in Sarawak, Sabah and Brunei, is proposed, the location of the factory being near Bintulu. Capital costs are estimated at \$4.75 mn. Computer analysis of discounted benefits and costs show ratios varying from 1.82 to 1 at a 7 per cent discount rate to 1.49 to 1 at 14 per cent and an internal rate of return of 25 per cent. A joint venture is advisable between Sarawak entrepreneurs and outside interests contributing expert advice in construction and management for the first few years.

The composite table which concludes this summary indicates statistically some of the more important targets of the Action Programme.

**TABLE 3 Action Programme Targets**

	1975	1976	1977	1978	1979	1980	approx. total of % increase
Land developed to agriculture cumulative net acres)	12,700	30,200	51,000	75,200	100,200	121,000 *	
Forest areas outside FAO Units logged for release to agriculture (acres)	26,850 **	25,300	38,900	20,850	10,500	5,200	127,000
FAO forest Units and swamp forests logged (approx. acres)							100,000
Road construction (miles)	57	48	43	33	40	28	250
Road improvement (miles)	13	33	26	21	20	17	130
Village commencement	5 ***	1	2	1	1	1	11
House construction:							
existing settlements							3,545
new settlements							3,064
road-based and private schemes							1,503
Population projections: ,000	140	145	151	157	163	170	21

Notes: \* 33 per cent oil palms, 30 per cent rubber, 11 per cent beef ranch

\*\* Includes 1974

\*\*\* Includes 1974

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

INDUSTRY

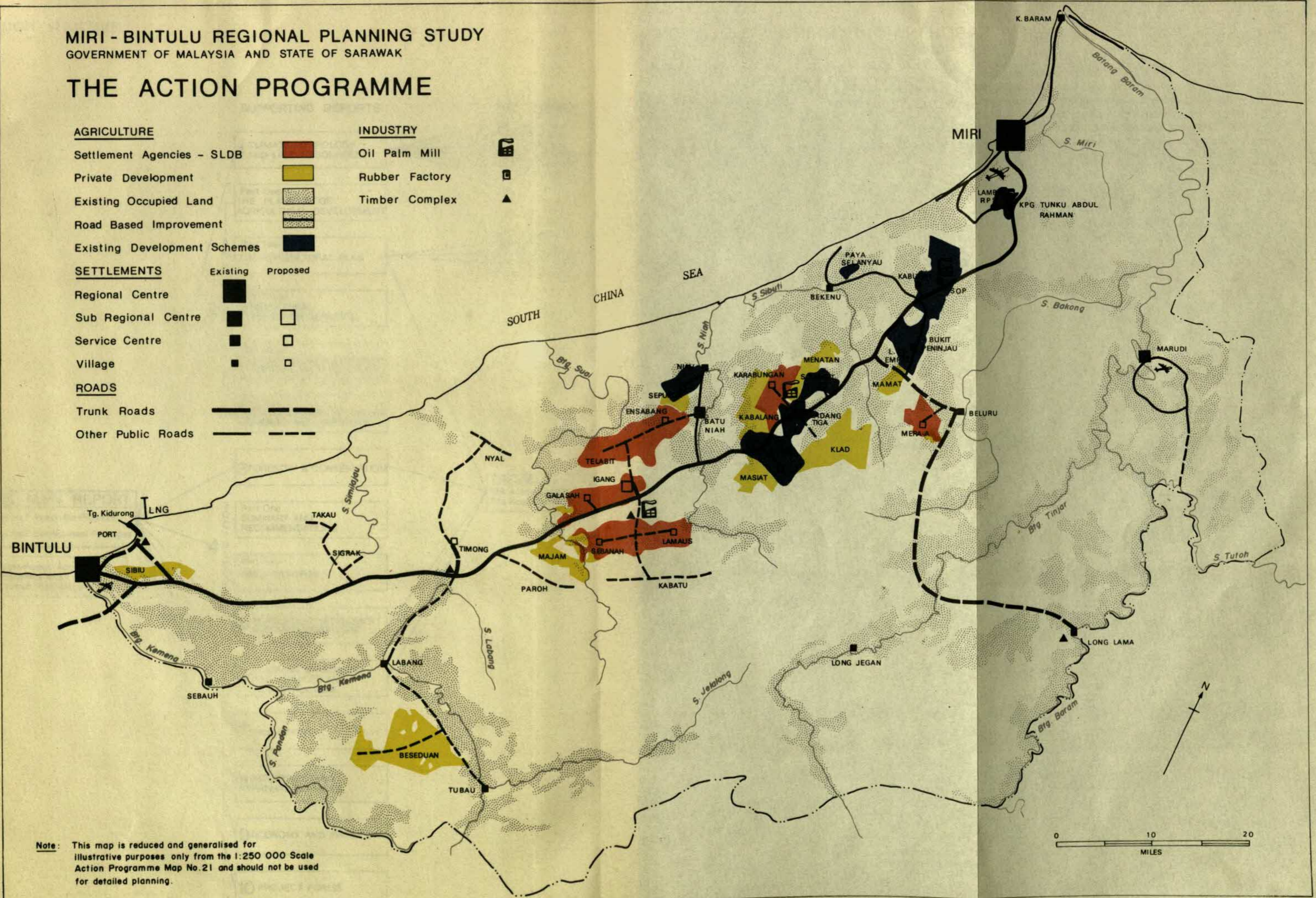
- Oil Palm Mill
- Rubber Factory
- Timber Complex

SETTLEMENTS

- |                     | Existing  | Proposed   |
|---------------------|---|--|
| Regional Centre     | <span style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 2px solid black;"></span> | <span style="display: inline-block; width: 15px; height: 15px; border: 2px solid black;"></span> |
| Sub Regional Centre | <span style="display: inline-block; width: 10px; height: 10px; background-color: black; border: 1px solid black;"></span> | <span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black;"></span> |
| Service Centre      | <span style="display: inline-block; width: 8px; height: 8px; background-color: black; border: 1px solid black;"></span>   | <span style="display: inline-block; width: 8px; height: 8px; border: 1px solid black;"></span>   |
| Village             | <span style="display: inline-block; width: 5px; height: 5px; background-color: black; border: 1px solid black;"></span>   | <span style="display: inline-block; width: 5px; height: 5px; border: 1px solid black;"></span>   |

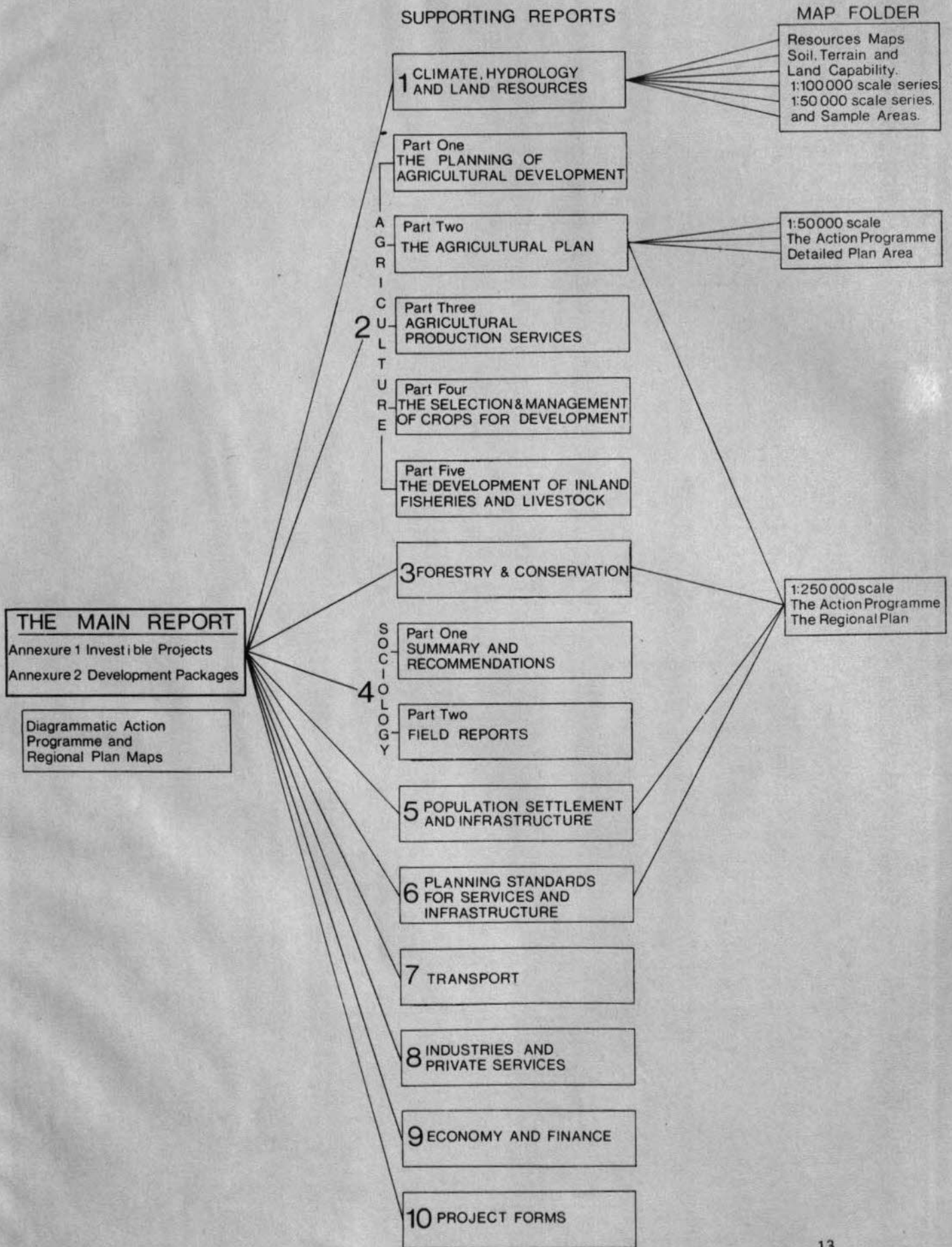
ROADS

- Trunk Roads
- Other Public Roads



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.

# Report structure



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