

MIRI - BINTULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER

ALTERNATIVE STRATEGIES
FOR RURAL DEVELOPMENT

An Interim Report for
Discussion with the
Steering Committee

— JANUARY 1973 —

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ALTERNATIVE STRATEGIES FOR RURAL DEVELOPMENT

S U M M A R Y

The object of this interim report is to outline certain strategies for agricultural development in the Study Area and to promote discussions on the subject with the Steering Committee. Several types of development are described and, although details of cropping patterns and acreages involved have not been sufficiently studied, some principles for locating development have been suggested. Based on these principles some areas for development have been indicated as shown diagrammatically in Figure 1. Although some indication is given of where development could be started no serious attempt has been made to draw up a phased programme.

There is agreement with Government's present policy of developing unencumbered State Land as well as giving attention to improved farming of agricultural land already occupied. On this occupied land, the majority of which is Native Customary Land, the main objectives of development remain:

- gradual reduction and eventual elimination of hill padi cultivation;
- the adoption by people of a viable form of settled agriculture and where possible concentrating it into part of the area over which they presently have customary rights;
- improvement of the amenities of rural life.

It is believed that the people are generally receptive of, and willing to adopt, new ideas aimed at obtaining these goals. The suggestion is made that an integrated institutional approach to development should be considered for implementing the changes. The basis for the approach would be the construction, or presence, of an access road and a land use plan of the area served. The aim would be to introduce simultaneously the following services under an integrated scheme:-

- agricultural extension and practical research;
- farmers organisations supplying farm inputs and arranging marketing, storage and processing of farm produce;

- banking for lending and saving;
- medical care;
- legal and social welfare, services;
- education;
- administration.

Though this broad based approach is not new in principle in Sarawak it is suggested that:-

- personnel from the various services should be combined into a single management team operating from a centre attached to an existing settlement in the area, or so sited that it would form the nucleus of a coming new town;
- road alignments should be chosen to pass close to existing long houses or villages and to pass through cultivated areas;
- farming should be encouraged and supported (by the development services) only in specified areas generally reasonably close to the roads and the centres, thus obtaining the concentration required.

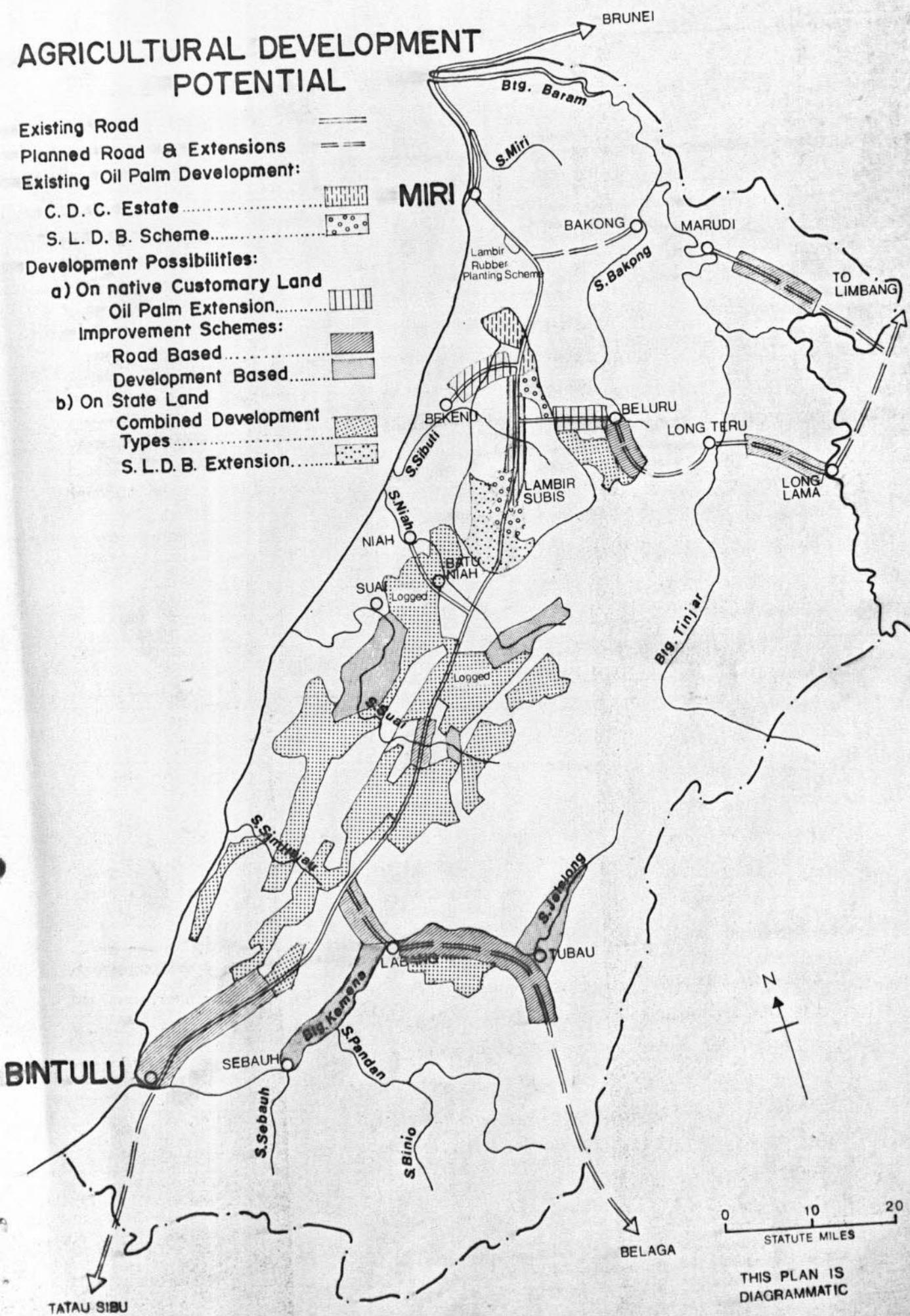
Such improvement schemes could be planned as:

- development into presently remote areas;
- development accompanying the construction of the State trunk road system;
- extension outwards from existing development;
- extensions planned in conjunction with future development on State Land.

Extensions outwards from existing developed areas could be undertaken in the near future in areas adjacent to the oil palm plantations in the Lambir-Subis Development Area . Planning could be done by the Consultants for sample areas following soil investigations and using enlargements of recent aerial photographs together with existing contour maps. These detailed plans could be used as examples for planning development on other similar land in the Study Area, probably also in other parts of Sarawak.

AGRICULTURAL DEVELOPMENT POTENTIAL

- Existing Road 
- Planned Road & Extensions 
- Existing Oil Palm Development:
- C. D. C. Estate 
 - S. L. D. B. Scheme 
- Development Possibilities:
- a) On native Customary Land
- Oil Palm Extension 
 - Improvement Schemes:
 - Road Based 
 - Development Based 
- b) On State Land
- Combined Development Types 
 - S. L. D. B. Extension 



0 10 20
STATUTE MILES

THIS PLAN IS
DIAGRAMMATIC

On State Land there are several systems of development already operating:

- the Sarawak Land Development Board (SLDB) estate type in which settlers will obtain a share in the profits but no title to individual parcels of land;
- the Commonwealth Development Corporation (CDC) mono-crop estate development;
- a multi-crop multi-institutional system represented by the youth settlement scheme at Pujut Lopeng near Miri;
- the Lambir Rubber Planting Scheme.

In the latter two types land is issued under title to the settlers.

As a consequence of studying these existing schemes it is believed that similar methods of development and settlement will be needed in the future. However, some modifications are suggested:-

- that the concept behind the youth settlement schemes is used as the basis for future settlements involving individual holdings, but that the criteria used for selection of settlers is widened;
- that the acceptance of issuing individual titled holdings is extended to the allocation, within planned schemes, of large holdings of sufficient acreage to attract investment and ownership by persons who are capable and willing to develop the land themselves using their own resources. This would involve in agricultural development a valuable forward looking section of the community which is at present, for all intents and purposes, excluded from the agricultural sector.
- that settlement schemes involving smallholders and individual investors (as opposed to SLDB type settlement) should be managed by an organisation formed by personnel from the departments and institutions involved in providing infrastructure and in which there is settler representation and participation;

- that mono-crop schemes should be avoided except possibly on some SLDB and estate systems of development. The consequence of correctly planned land use on other types of settlement would generally be a mixed cropping pattern perhaps including livestock.

The suggestion is made that development within an area could advantageously include two or more systems, each system being allocated a specific section of land. The importance of each system could vary from one area to another as well as over time. It is believed that at present, and in the near future, the SLDB and estate types will be the most important, but in time, though all types would continue, those involving individual holdings would become paramount.

ALTERNATIVE STRATEGIES FOR RURAL DEVELOPMENT

1. Introduction

The rural land in the Study Area can be divided, for development purposes, into two categories: areas presently unoccupied, usually State Land, and areas with an existing population, mostly Native Customary Land. (see Appendix II Glossary, for particular meanings of land categories). In the unoccupied areas found suitable for agriculture several development policies might be practical. For example, the traditional large-scale developments applied by the FELDA, SLDB or private company estates could be used, but also forms of settlements in which discipline and control appear to be less rigid would be practical. In areas with existing populations, the largest group of whom practice shifting cultivation of hill padi, the SLDB or estate forms of development would be generally impractical because much of the land is already under customary right utilization or is individually owned. Although plantation-type crops could often be grown, other ways will have to be found to implement schemes in these areas.

Development in the unoccupied areas will entail the movement of settlers from other parts of the Study Area and partly from other Divisions in Sarawak. Consideration must be given to the satisfactory integration of these new settlers and the land they develop with the existing population and their farming areas. In this part of Sarawak compared with the First and Second Divisions, the pressure on land from the existing population is at present considered negligible. However, there are already numerous examples of illegal infringements and squatters moving into State Land. This could be a result of a desire by the people to lay claim to more and more land as an insurance for their future generations, or it could result from the need to open new land because the already used land is unsuitable or worked out. Probably both reasons are involved, but it is clear that it would be unwise to devote development effort to the settling of migrants on State Land without a considerable, probably equal effort, to improve the conditions on existing occupied land. If no schemes are undertaken to make better use of this land it can be expected that the illegal occupations of the State Land will increase as population increases.

It is believed that this pressure on land could be alleviated if the shifting hill farming could be changed to settled farming in which correct land use and more suitable cultivation practices could be developed and established. A peaceful co-existence of the two groups of people, new settlers and the existing rural population, appears to depend on a change in agricultural practices of the shifting cultivators. With these thoughts in mind, the development possibilities of the two categories of rural land are discussed below.

2. Development Possibilities in the Occupied Areas Shifting Cultivation

The desirability of persuading the peoples practicing shifting cultivation to accept a viable form of settled agriculture is no new theme to the Government of Sarawak. Not only is the system a wasteful method of using land but its end result, as increases in population force shorter and shorter rotations, is reduced yields and an impoverishment of the farmers. There are numerous examples, particularly in the First and Second Divisions, where this stage has been reached and it is from such areas that many of the participants for settlement schemes in the Study Area are expected to come. Government has long since realised the need to prevent such disasters occurring over an ever widening area in Sarawak. Therefore, a series of agricultural and educational schemes have for many years been directed at the shifting cultivator population. Despite the widely dispersed nature of these schemes and their narrow base, usually a subsidy for one crop or enterprise, there has been success in some parts of the country. Success in the form of small rubber plantations, swamp padi fields, pepper, coffee, coconut and fruit tree gardens, which indicate that the people are willing to try new farming methods. However, there is also considerable evidence that little progress has been made on one fundamental aim of these schemes, namely to reduce and eventually eliminate the practice of shifting hill padi cultivation. This suggests that the basic reasons for the people to undertake hill padi cultivation are not being changed.

It is well known how closely the cultivation of hill padi is interwoven into the everyday life of these people. But besides the religious connections there are more secular reasons. In some parts of the country where these people live there is no other way of producing their staple food, also there is considerable evidence that the customs attached to hill padi cultivation arise from fear of starvation. The groups have perhaps learned from bitter experience in their history that a crop failure, in even one year, could mean extreme hardship for many of them. These people have therefore developed a cultivation system which, under the prevailing conditions, invariably provided some food. It would appear that if this inborn fear of starvation could be removed then a major obstacle towards abandoning hill padi cultivation would be overcome.

There is ample evidence of the peoples willingness to adopt certain changes in their way of life. The almost complete acceptance of schooling for their children, the purchase of outboard motors for their long boats, the use of pressure lamps in their houses, the migration of numerous rural people to the towns. These and other examples are proof that the people appreciate the advantages of a more diversified life and understand that participation in the money economy of modern society is the way to realise these advantages.

An obvious and, under some circumstances, a practical way of minimising the build up of pressure on the land due to a rising population would be to attract the increase in population from these areas to industries created in or near large towns. Thus the people left behind would at least maintain their present standard of living. However, that in itself is an inadequate objective and would be leaving much of Sarawak's limited agricultural land producing at a very low level. Thus improved farming must be an objective of overall development and the long term measures adopted should combine modern farming methods wherever suitable land exists, the provision from some source of an assured cash income with which to buy rice, and the assurance that rice would be available, if necessary by initial guarantees of food relief.

A Comprehensive Development Approach

The concept of a comprehensive development approach emerges from considerations of these requirements; an approach which would combine the services of agricultural extension, education and research; the supply of credit; provision of marketing, processing and storage facilities (perhaps in the form of cooperatives); transport arrangements together with the building of schools, health clinics, shops etc., around a planned service centre which would form the nucleus of a town.

Road Based Development

In Sarawak generally, but particularly in the Study Area, the possibility of improving communications provides a key which, if carefully used, could open the door for acceptance by the shifting cultivator of an improvement scheme. In the majority of the areas of shifting cultivation the main lines of communication are still the rivers, and the main means of transportation the long boat and the humans themselves. Very often the rivers do not lead directly to service centres where facilities such as schools, hospitals, markets, administration etc. exist. The desire on the part of the people to avail themselves of better communications is widely evident in the way cultivation follows so closely behind the construction of almost any road. This is evident even on timber extraction roads if they open the way to a service centre, but the evidence is far more apparent on the trunk road between Miri and Bintulu.

Though this spreading-out of the people could be associated with land acquisition it strongly suggests that the provision of a road into a remote area of shifting cultivation would act as a magnet and draw people to cultivate close to it. It would be important that the alignments of the roads should be chosen to serve existing settlements and pass through agricultural land rather than necessarily follow the easiest line of construction. Possibly the building of the road could be used as a powerful argument and incentive towards obtaining the peoples acceptance of a complete range of development inputs designed to ensure the establishment of a viable form of settled agriculture.

A condition that should be satisfied before constructing roads should be that the capability to accompany the road construction with a planned development scheme exists, also that the people who would benefit from the road have been consulted and are receptive to the idea. Once such a community has become sedentary around the road and the service centre they would have left their more remote holdings which would then be available, by purchase if necessary, for settlement of other people based on a new or an extended road system.

Concentration of Cultivation

The concept of the shifting cultivators agreeing to concentrate their cultivation into only a portion of the land over which they have customary rights and to relinquish their rights on the remainder, even if purchased, is one open to doubt at present. However, it is an important objective towards, which any improvement scheme in these areas should be aimed because current investigations show that the average land holding of a longhouse family in the Study Area varies between 40 and 80 acres, though it is known that this is seldom in one block. If concentration could take place there would be, in some cases, considerable land available, not only for the natural increase within a particular longhouse but also for settlers from other areas.

Initially there should be no intention of developing more land than would be necessary to provide each existing family with, for example, some 10 to 15 acres. (The acreages have been chosen merely for illustrative purposes.) The improved area would be around the scheme service centre and in a ribbon bordering the access road with some spur roads to provide sufficient area. The extent of the development away from the road and the service centre would depend on two main factors;

- (a) the type of crop to be grown, or conversely how far is it reasonable to expect a person to carry the produce of the crop. For example, oil palm and tapioca would be grown only close to the road, say within 200 yards, while rubber up to half a mile and coffee, anatto, pepper and cocoa could be grown up to perhaps one or two miles away.

(b) the distance that the scheme extension staff can be expected to penetrate, work and return on foot each day; perhaps two miles.

The problem of rearranging individual land ownership within the improvement area should be left to the people themselves but would best be done before the planting of permanent crops. Government and the scheme authorities would, in respect of land allocation, generally only offer services for land use classification, mapping and surveying; in fact provide a land use plan. The concept suggested is one whereby road construction to previously inaccessible areas should be automatically accompanied by an integrated, widely based development scheme.

At present there is only a rudimentary road system in the Study Area and though many new roads will be required (some are already planned) for administrative purposes, the justification for them will be greater if they are accompanied by planned agricultural and/or forestry development.

Mixed Cropping Patterns

Improvement schemes in areas of Native Customary Land and in Titled Land should aim to develop a mixed cropping system and not a mono-crop culture of the estate type of development. The agriculture should be based on developing the land according to its capability. For example, low lying land not liable to excessive flooding should be developed for wet padi or fish ponds if it were mineral soils, or if it were peat, left alone or perhaps planted to suitable species of trees; but generally no large-scale attempt should be made to drain that land to make it suitable for dryland crops during the main padi season. Gently undulating and/or well drained land with deep soil should be planted, depending on its location to crops such as oil palm, cocoa, coffee, bananas, anatto, cashew nuts, essential oil crops, fruit trees, vegetables, tapioca, pepper and other spices; the more steep slopes planted to high yielding rubber, while areas with shallow soil might be planted to pastures or, if very steep, left to forest. Not all these crops would be grown in any one improvement area but each of the farmers would have their economy based on at least two, possibly more, crops.

The crops for which assistance would be available would be a matter of deliberate development policy based on the particular attributes of the area and on the special requirements and market possibilities of different crops. For example, oil palm would in general not be encouraged at distances greater than about 15 to 20 miles from the nearest oil extraction mill because the cost of transporting the fresh fruit bunches would become too great. Also because the fruit bunches are large, heavy and difficult to handle, and because the farmer is initially likely to have only human labour to extract the bunches from the field, the planting of palms would only be encouraged and supported within 200 yards of a collection road. The bulkiness of tapioca tubers would impose a similar restriction on this crop. Other crops such as rubber, cocoa, coffee, pepper, some other spices and essential oils require only relatively cheap primary processing facilities which can be built close to concentrations of such crops. Thus, an important aim of development policy would be to ensure that sufficiently large plantings of these crops occur in a given project area to warrant the construction of at least a primary processing unit. Concentrations of plantings could be assured through the credit policy and by the provision of specific storage, processing and marketing facilities together with encouragement by the advisory service of selected crops in specific areas.

A further development possibility, for which the investigations are still incomplete, is that of making fuller use of the existing, often small, scattered rubber plantings. In some cases, when reasonable concentrations of rubber occur, it may be possible to organise daily collection of fresh latex for processing in a central factory. For the more scattered and remote plantings a system of collecting coagulated latex, tapped by the polybag system, may be possible. An important aspect in this connection is a Government proposal to build a rubber processing factory in Bintulu.

3. Development Possibilities on State Land

3.1 Description

At present there are four types of organised development being undertaken on State Land in the Study Area. Two are based on oil palm planting; an SLDB settlement scheme and a CDC estate. Both are in the Lambir Subis Development Area. The third development system is a youth settlement scheme at Pujut Lopeng, near Miri; it is under the direction of the Settlement Section of the Department of Agriculture (Education Branch). The fourth system is the partially completed Lambir Rubber Planting Scheme 'B', about 9 miles south-east of Miri. These schemes are briefly described below, followed by a discussion on the suitability and desirability of continuing with these methods in the future.

The SLDB Settlement Scheme

Operations started in 1970 and up to date about 6 000 acres of oil palm have been established. The future programme is 7 000 acres in 1973 and 10 000 acres in 1974; a final total of 23 000 acres. Eventually there will be roughly 2 300 families living in six villages, each of about 400 houses.

The settlers, when they are introduced, will be organised for work purposes into a labour force similar to that on an estate. It is present policy that each settler will have a share in the scheme equivalent to 10 to 15 acres of the crops planted but there will be no identification of a settler with any particular piece of land. Thus no individual land titles will be issued except in so far as 0.2 of an acre is attached to each house bought by the settlers. On this land they will be able to grow what they wish, but potential settlers have expressed dissatisfaction at so small an area.

The CDC Estate Development

This was started in 1969 and there are already 5 500 acres of oil palm established. The future planting programme is to expand the oil palm area as rapidly as possible to reach a maximum of 10 000 acres. An oil extraction mill, to handle fruit from this area, will be built in 1973. The whole organisation is planned and run as a commercial estate and there are no known plans at present for any future changes in policy.

The Pujut Lopeng Youth Settlement Scheme

This scheme is the first in the Fourth Division of a planned programme of schemes for the whole of Sarawak designed to provide opportunities for the increasing number of secondary educated youths emerging from the expanding education system. Special agricultural training is given to selected students at various farm institutes with the intention that the youths should then become settlers in a development scheme.

The first group of 17 students, a mixture of all ethnic groups, from the Kabuloh Farm Institute in the Fourth Division completed the course at the end of July 1972 and started work on the scheme. Title to about 13 acres of land will be given to each settler in the second or third year depending on how well the scheme as a whole progresses. The settlers will be entitled to assistance from the various subsidy schemes, such as the Coconut Planting Scheme and Assistance to Padi Planters Scheme. Once titles have been issued credit will be obtainable from the Sarawak Economic Development Corporation for housing and farm projects.

The Lambir Rubber Planting Scheme 'B'

The scheme started in 1964, covers about 1 900 acres. Land clearing and the establishment of high yielding rubber seedlings was undertaken in phases by Government. Settlers were given title to roughly eight acres each of the rubber plantation two years after establishment. About 160 acres of the latest planted rubber is unallocated. The present number of resident settlers is 146 and there are 28 non-resident lot-owners. The settlers are based in a well established village.

3.2 Discussion

Estate Model Holdings

There is a need in Sarawak for the SLDB type of settlement because here, as in every community, there are people who prefer to be employed and directed in their daily work and other people who are not able to organise their own productive activities independently, especially when production and marketing of produce becomes complicated. These types of persons are likely to form the majority of the SLDB settlers as a result of the

present recruitment policy which is designed to select those persons presently without employment, very little capital and no land; it is necessary that such persons are catered for in the development of the country. Thus there is no expectancy of terminating this method of settlement, but there is considerable doubt if it should be the only method or that once a settler is enrolled into such a scheme that there should be no chance of changing to a more liberal type where an individual's initiative and energy can be applied in a wider range of activities leading to a higher personal income and accordingly a higher national income.

For different reasons there is a need to continue with the estate type of development. It is an ideal method of pioneering large-scale development in new areas. The organisations which are willing to undertake such development have the capital required and personnel of the right type, with sufficient training and know how, to run such schemes. A well run estate, by demonstration and by providing processing and marketing facilities, can act as a catalyst and a focal point upon which to base other types of development. In this way the limited resources of Sarawak, particularly in personnel, could be used to take advantage of this initial development. Hence it is thought that estate type of development could continue for some time yet.

Small Holdings

The existence of the Lambir Rubber Planting Scheme shows that the authorities are aware of the need for a type of settlement based on small holdings. However, this particular scheme has in some ways not been successful and rings a warning that these schemes, like any other forms of development, must be very carefully planned and implemented. They must be flexible and capable of adjustment to changing technical, social and economic conditions.

The Lambir Scheme has been investigated by the Planning Teams' Sociologist and his findings are incorporated into an interim report "The Human Factor in Development". Conclusions concerning small-holder settlement schemes that can be drawn from the report are:

- (a) There must be a workable channel of communication between the settlers and the scheme management. Settler participation in the management would be important;
- (b) There must be provision for obtaining an early income so that earnings are balanced over time. Similarly there must be scope for meaningful work over time;
- (c) Settlers must understand clearly their rights and obligations on the scheme;
- (d) Land should be issued on a firm security of tenure basis but there should also be provision for cancellation of tenure rights if development agreements are grossly violated.
- (e) Settlers should be consulted concerning their housing; if possible the settlers should build the houses themselves;
- (f) If cooperatives are to be part of the supply and marketing systems in a scheme they must be efficiently run and prices must be at least equal to nearby private shops.

Youth Settlements

The Youth Settlement organisation in Sarawak has the aim of filling the need for a type of settlement based on individual holdings where the criteria for selection is aimed at obtaining a more advanced type of settler than is obtained under the SLDB or Lambir Rubber systems. It is vital that some form of employment or advancement opportunity is given to the increasing number of partly educated youth emerging from the expanding education system.

The ideas and aims of the Youth Settlement organisation are admirable however, it is believed that the criteria for selection in the present Youth schemes are too narrow. The demand that the settlers should have at least a Form 3 education and a 12 month course at one of the Farmers Training Institutes probably provides the best educated settlers in any developing country, but they are an unnecessary luxury. There is no need to have settlers with such high standards of education or training. Furthermore such restricted selection can only result in an settlement community whose age structure would be unbalanced.

There appears to be a need to widen the qualifications to include, for example, older persons with some proven success in agriculture, such as owning a well run holding but one which is too small to provide a reasonable living. The disposal of the holding would be a prerequisite for joining the settlement scheme. There is a need too, to lower the minimum education standard so that a wider range of youths can be accepted. The criteria should aim at obtaining people with initiative and with sufficient education or natural talent to be able to undertake efficient modern farming. They must be willing to accept advice as well as being aware of the need to have an organised approach to the development scheme as a whole and their own farm enterprises in particular.

Such settlers would still require considerable help and support in becoming established; help would be needed for land clearing, provision of roads, houses, domestic water supply, schools, clinics; and credit would be needed for the purchase of planting material, fertilizer, pesticides etc; support would be required in the form of agricultural advice and training as well as organised processing and marketing of the farm produce; but each settler would work on an area of land which in due time would become theirs under title.

Individual Investors

There is need too for a settlement system for yet another group of potential settlers; those who have enough capital or are sufficiently credit worthy to enable them to finance the development of a holding themselves.

These are the citizens who wish to invest their money in the agriculture of the country. These persons would be capable of developing a parcel of land, considerably larger than a small holding envisaged in a small-holder scheme, but would still need to be within an organised and planned project where all the infrastructure of roads, service centres, processing and marketing facilities are provided. However, physical assistance in the form of land clearing, house building etc. need only be at a minimum, but technical advice and all the other agricultural inputs, seed, fertiliser, pesticides etc. would need to be made available. Credit could be provided on a much larger scale than for the small-holders and it could be individually negotiable from special funds in a commercial bank. Credit worthiness would be a major criterion for selection to the scheme. Specific clauses written into the title deeds for the land could provide a lever whereby correct and timely development of the land could be assured.

Settlement by Ethnic Groups

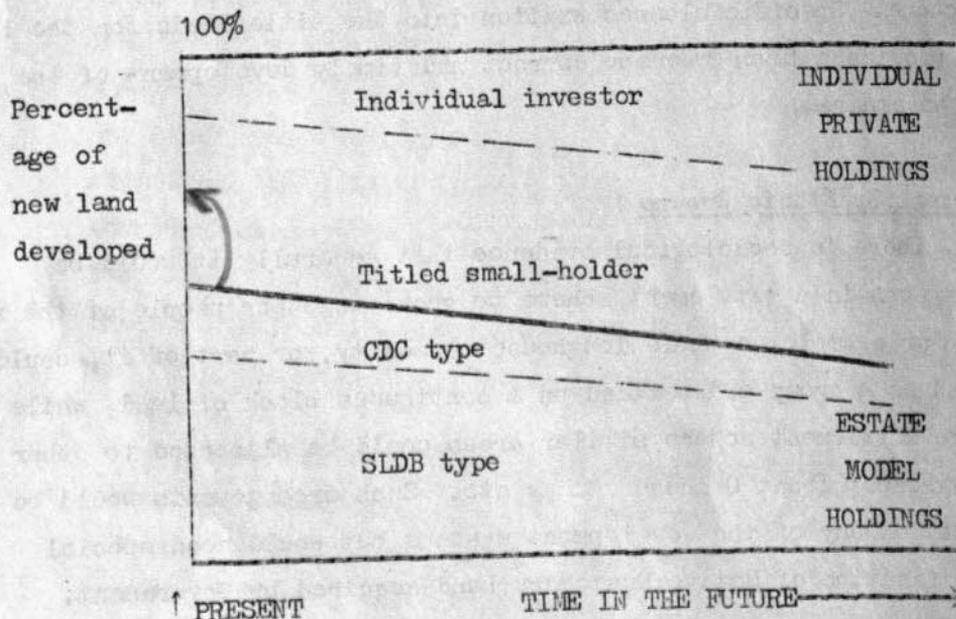
There is sociological evidence that generally it would be advantageous in a settlement scheme to group together people of the same race. For example, a whole longhouse community, or part of it, could be moved as a group and settled on a contiguous block of land, while in the same settlement scheme similar areas could be allocated to other ethnic groups, Iban, Chinese, Malay etc. Such arrangements would be practical on any of the development systems but would need special reclassification of Native Customary Land acquired by Government.

Development by Combining Systems

There is no reason why all types of development should not be combined within one development area, each type allocated its own area around one common centre but administered differently. The proportion of the whole project allocated to each type of settlement would be important and would depend on the particular circumstances of the project.

At present in Sarawak the immediate need is probably greatest for the SLDB type of settlement, followed in order, by the titled small-holder type, the individual investor type, and lastly CDC estate type of development. But in future, as education in the country improves, these priorities would probably change, a need could be expected for an increase in the titled small-holder and individual investor schemes at the expense of the SLDB and estate types. This concept is illustrated in Figure 2.

Figure 2. The Relationship Over Time Between Different Types of Development on State Land



The combining of different types of development into one area does not necessarily dictate that only one crop should be grown. Although in any one given development area there will probably be only one main crop, oil palm for example, and this will be grown on the major portion of the area, it need not, in fact should not, be the only crop grown by the small-holders and individual investors. Other crops suitable to the area should be encouraged. Having the SLDB and/or CDC types of development in a scheme area offers the opportunity of providing processing and marketing facilities for a whole range of selected crops, not only for the main one. In addition, it would offer the opportunity for settlers or labourers to change easily from one type of organisation to another; the SLDB and CDC type schemes could readily

become the source of well trained settlers for adjacent small-holder schemes. In addition a multi-type development would provide a population of wage earners who would require supplying with vegetables, fruits, meat and eggs thus widening the possible enterprises on the adjoining farms.

4. Possible Locations of Different Types of Development

In this report consideration for development has only been given to those areas which in the Zonation Plan were assessed as possibly having agricultural potential. Before any area of land is actually chosen for improvement or development it should be subjected to further topographical and soil investigations. The various areas mentioned as possible locations for schemes are indicated in Figure I (following page ~~ii~~ in the summary)

Areas with existing populations

There are blocks of shifting cultivation well situated for the road based improvement approach. For example, the lands east of Beluru towards Long Teru, again around Long Lama, near Labang, Tabau and south east of Marudi. Construction has already started on the extension to Long Teru of the existing Beluru road, and on the road south eastwards from Marudi to Linei. A road joining Labang and Tabau to the Miri/Bintulu road is planned to start in 1974. Suggestions have been made for a road to be built to join Long Teru and Long Lama but at present there are no firm plans for this.

In other parts of existing cultivation, such as along the main Miri/Bintulu road and the secondary roads to Beluru and Bekemu, the pre-construction leverage for obtaining the cooperation of the people bordering the roads has been lost. Nevertheless, the opportunity still exists for improvement in the areas which border these roads leading to the developing oil palm schemes. It should be relatively easy to persuade the people to plant oil palm under schemes which would provide the full range of facilities including arrangements for collection of the fresh fruit bunches and their sale to the neighbouring oil palm schemes.

Improvement schemes in narrow, road-based strips would be directly applicable to the Native Customary Land along the road to Beluru and along the main Miri/Bintulu road where the amount of titled land is negligible. The development could be limited initially to sufficient land bordering the roads and around Beluru to cater for all the families now resident in the blocks of Native Customary Land.

..... Around Bekenu; and along the road leading to it, much of the land is held under title; thus the same degree of concentrated development could not be expected as could occur in a purely Native Customary area. Therefore, a spur road system would have to be contemplated to serve those areas of titled land some distance from the existing road.

Development in these areas could start in the near future. Detailed planning of sample areas along the roads could be undertaken using existing aerial photographs and contour maps followed by soil studies. Sample areas along the Bekenu and Beluru roads together would cover two land tenure situations which are reasonably representative of large tracts in the Study Area, perhaps also in other parts of Sarawak. The detailed plans could, it is believed, be used as examples of development planning for these other areas.

Road based improvement schemes could also advantageously be undertaken later in those Native Customary Lands bordering future SLDB or CDC type development schemes on State Land. The planning of such schemes should automatically include extensions into the adjacent Native Customary Land. Also with the possible development of Bintulu into a major service and timber industry centre the opportunity will arise for considerable expansion of market gardening into the occupied lands north of the town along the Miri-Bintulu road.

Unoccupied Areas

The locations of development on State Land will be dictated by the distribution of the land found suitable for agriculture. In Figure 1 large blocks of land possibly suitable for agricultural development are shown to be reasonably close to the Miri-Bintulu

road, also adjoining the eastern boundary of the Lambir Subis Development Area and close to the planned road extension to Labang and Tubau. These areas are likely to prove the most convenient on which to commence development schemes but those lands which have already been logged will probably take precedence.

5. Development Organisations

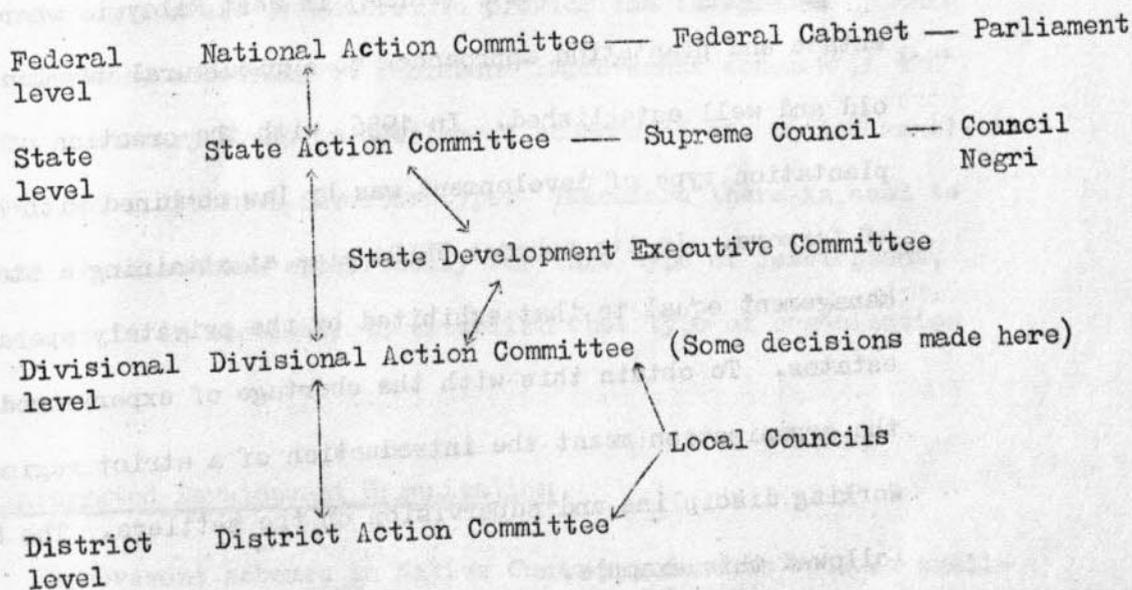
The organisational requirements of the different types of agricultural development and settlement vary considerably, and if the need for different types is accepted then the need for different organisations to implement and manage them must also be accepted. For this reason the existing organisations dealing with agricultural development and settlement have been briefly studied and their suitability assessed for the multiple-type approach envisaged in this report.

State Control of Development

The central chain of command and decision making in Malaysia and Sarawak is shown in Figure 3.

Figure 3

Decision Making Process



The functioning of this process and the composition of the committees and councils are described in Appendix I. The

implementation of a scheme by SLDB or any Government Department (e.g. a Youth Settlement Scheme by the Agricultural Department) is supervised by the State Action Committee through the State Development Executive Committee and the Divisional Action Committees. Together these executive bodies are responsible for the overall coordination, priorities and timing of individual Departmental inputs. The funds for carrying out these inputs although held within the respective Departments, the allocation of them will have been previously scrutinised by the State Action Committee. It is clear that provided the executive power of this arrangement is fully used it is adequate to direct, control and support all rural development in Sarawak. Thus there is no apparent need for additional executive bodies.

The SLDB Organisation.

This organisation has a structure like that of the Federal Land Development Authority (FELDA) in West Malaysia where the estate and plantation approaches to agricultural development are old and well established. In 1956, with the creation of FELDA the plantation type of development was by law combined with settlement of farmers. In its schemes FELDA aims at attaining a standard of management equal to that exhibited by the privately operated company estates. To obtain this with the shortage of experienced people in the organisation meant the introduction of a strict regime of working discipline and supervision on the settlers. The SLDB has followed this example.

The SLDB is a semi-autonomous organisation with a board of directors. It is allocated its own funds and has a high degree of administrative freedom in executing land settlement schemes under a policy directed by the Sarawak State Action Committee. However, as has been explained, its powers and resources do not cover all aspects of land development. For example, after land is made available by the State Government the surveying of the land and investigations into tenure problems call for the cooperation of several separate Government Departments, furthermore implementation of such aspects as timber extraction, road construction, building of schools, health clinics etc. are the responsibility of the respective Departments in charge of these activities.

There is no obvious need to alter the organisation of the SLDB which need only be enlarged to undertake more development of its present type. However, neither the SLDB nor the estate type of organisation are orientated to provide the integrated organisations necessary to implement improvement schemes in the Native Customary Lands or settlement schemes of the titled smallholder and individual investor type. Therefore there is ^a need to create organisations specifically for this type of development, but first it is necessary to establish what type of organisation is needed.

An Integrated Development Organisation

Improvement schemes in Native Customary Land as well as smallholder settlement schemes and individual investor schemes on State Land all have similar basic requirements for an integrated development approach whereby a wide range of services are made available to the settlers through a central management. This

approach although hinted at in the Sarawak Development Plan 1964-68 is not actually described and it is not being used at present in Sarawak. However, in some parts of the world the approach is already being applied, for example, in Comilla in Bangladesh; at Asela in Ethiopia by the Swedish International Development Aid; and in Lilongwe, Malawi, by the International Bank of Reconstruction and Development.

The services which need to be made accessible to independent farmers include:-

- (a) basic agricultural research as well as experiments and trials on practical farming problems;
- (b) agricultural advisory and training services to farmers and their families;
- (c) banking service for lending and saving;
- (d) supply of farm materials;
- (e) storage, processing and marketing of farm produce;
- (f) special services in plant protection, animal health, soil conservation etc.;
- (g) legal and social welfare services;
- (h) medical care;
- (i) administration.

The harnessing of all these services would be needed to implement a planned agricultural improvement scheme in occupied land or a development scheme in unsettled areas. Moreover the services would be required simultaneously. Research is ineffective without advisory services; advisory and credit services to farmers will not function properly without the simultaneous supply of farm materials or efficient marketing of the farm produce. The services are complementary and their balanced operation is essential; regulations too stringent and

centralised on one institution or service would hamper operation of the others.

From Appendix I it can be seen that the concept of integrated development is feasible in Sarawak. A development centre, built at a strategic place, could be the headquarters for the various services and institutions for each major development area. The size of such centres would be determined by conditions such as the aim and scope of the project, accessibility to the area, transport facilities, type and quantity of production. Generally a development centre would include inputs from all the services previously mentioned. It can be visualised that over time several development centres could be established in the Study Area each one either attached to an existing town or village, or forming the nucleus from which a new town could grow.

Staffing of a service centre would require the allocation of personnel from the various organisations involved. These persons would form the management authority. The representatives could, however, still be responsible to their respective organisations or Government Departments but they should be delegated the power of decision necessary for the day to day operations of the centre. In this way the flexibility in operations needed in agricultural development would be provided. Each development centre would be under the overall leadership of a senior officer who, besides having close cooperation with local authorities, could have access to the Divisional and State Action Committees.

It is believed that the promotion of farmer participation in the leadership of the central services would be in line with Government policy. Their representation in the management authority could be by election from among themselves. The development of farmer's associations and cooperatives could be encouraged and could be formed when farmer leadership has developed and a sound economic reason for them is established. The success of a project would be measured by the degree it is able,

- (a) to repay the investments;
- (b) to keep the farmers content; and
- (c) thereafter leave a surplus of capital to expand activities.

Within a project operating under an integrated institutional system, whether in an existing farming area or in a new development area, the economic assistance to farmers for establishing and maintaining their crops would, it is believed, best be in the form of controlled credit. This method is likely to lead to lower public expenditures than are incurred in the present method of subsidy schemes but it would call for a change in government budget allocations from subsidy schemes to a fund for credit in the development organisation. The integrated system would ensure that the credit service (budgeting, supervision, marketing) would be efficient. The risks would be minimised because the concentration of the technical services should ensure good agricultural production and reasonably high farm incomes.

The allocations of funds and staff to initiate an integrated institutional scheme would need to be larger during the project implementation period than later, because the requirement for expertise, training and field staff would be at a maximum at the start but would progressively decrease during the running-in and maturity periods, thus releasing staff for other activities.

DECISION MAKING, IMPLEMENTATION AND FINANCING
OF DEVELOPMENT PROPOSALS

I.1 Introduction

The purpose of this paper is to see how decisions on development proposals are made; and how the proposals, after being decided upon, are implemented and financed. The findings are largely based on meetings with the Resident, Fourth Division; Administrative Officer (Planning/Development), Fourth Division; Secretary, Miri District Council; Divisional Education Officer, and on some publications from the AO(P/D)'s office. Development proposals, which are likely to be incorporated in the National or State Development Programme could either originate from the top or bottom levels of the hierarchy. The existence of various action committees, at the top (the Federal level) - the National Action Committee; and at the bottom - the District Action Committee, facilitates the formulation of National and State Development Plans. Most of the development proposals originate from one or other of these action committees - Federal, State, Divisional, or District - whose compositions show a representation of people from every walk of life.

I.2 Development Organisations

Within Malaysia, several action committees with varying functions exist at different levels of responsibility. The existence of these committees helps the National or State planners to identify projects which are urgently needed by the people or projects which could benefit the Federation or State in terms of employment creation, increased revenue, Gross National Product etc.

In Sarawak, at State level there is the State Action Committee (SAC), at Divisional level the Divisional Action Committee, while at the District level the District Action Committee.

The National Action Committee

The National Action Committees membership consists of the Cabinet Ministers, Chief Secretary to the Government, Chief of Staff of the Armed Forces and the Inspector General of the Police. It has a working subcommittee consisting of the Prime Minister, Deputy Prime Minister, Minister of National and Rural Development, Minister with Special Functions, Deputy Minister to the Prime Minister and Chief Secretary to the Government. This subcommittee works closely with the Coordination, Implementation and Evaluation Unit of the Prime Ministers Department. In addition, at the Federal level there is the National Economic Council.

The State Action Committee (SAC)

The SAC includes members of the State Cabinet, Federal Secretary, Federal Minister for Sarawak Affairs, State Secretary, State Financial Secretary and State Development Officer. The committee has the following functions:

- (a) to consider proposals for development work from Divisional Development Committees and to weld them into a State Plan reflecting national development objectives and aspirations;
- (b) to review cases of delays and difficulties in the implementation of the Plan and to propose specific solutions;

- (c) to make recommendations for necessary adjustments in the development programmes of the State as a result of changes in the economic situation;
- (d) to consider any subjects brought to its notice which have a direct or indirect bearing on development;
- (e) to prepare annual development estimates for approval of the Council Negri and Parliament (through the National Action Committee);
- (f) to co-ordinate the work of Departments at State level for the implementation of development projects;
- (g) to ensure that development work is implemented according to the Plan;
- (h) to liaise closely with the National Action Committee.

This committee has a working sub-committee (the State Development Executive Committee) consisting of Heads of Government Departments, and Permanent Secretaries of the State Ministries, while the Chairman of the Sarawak Economic Development Corporation and the State MARA Officer are co-opted members. The sub-committee has the following terms of reference:

- (a) to examine and to make recommendations on any problems on development which need detailed consideration before submission to the SAC.
- (b) to execute decisions made by the SAC.
- (c) to implement any other responsibilities allocated to it within the framework of the policy of the National Action Committee.

Divisional Action Committees

The membership consists of, Divisional Heads of Government Departments, all District Officers, all members of Parliament and all Council Negri members living in the Division. The Committee is chaired by the Resident of the Division and has the following functions:

- (a) to collect and consider proposals for development work from the District Action Committees;
- (b) to prepare for submission to the SAC annual detailed proposals and priorities for development work within the framework of the Plan;
- (c) to co-ordinate the work of Government Departments ensuring that cooperation is achieved in the implementation of development projects.

The Divisional Action Committee has a sub-working Committee, the Divisional Development Executive Committee whose members consist of; the Resident, Administrative Officer (Planning/Development), Divisional Engineer, Divisional Agricultural Officer, Divisional Education Officer, Superintendent of Lands and Surveys, Sarawak Economic Development Corporation and Divisional Superintendent of Police.

District Action Committee

This committee is the lowest in the hierarchy. Its functions are: (a) to prepare and collect a Red Book plan for its decision;

(b) to collect, consider and submit proposals for development work (within the framework of the Red Book) to be carried out during the following year in the District and to set down priorities for submission to the Divisional Action Committee.

The membership is; the District Officer, who acts as Chairman and Secretary; Chairman of District Council; members of Parliament and Council Negri members living in the District. Representatives of various departments are co-opted if the Chairman so wishes.

Besides these committees, there is a State Development Officer, who is a Federal Officer from the Co-ordination, Implementation and Evaluation Unit of the Prime Minister's Department. He acts as a co-ordinator between Ministries and Department at State level, and liaises closely with the Federal Ministries, while the Resident performs this function at the Divisional Level.

I.3 Decision making on development proposals

Within Sarawak, the highest decision making body is the State Action Committee. As its membership and functions imply, it is here that various development proposals from the Divisional Action Committee are given consideration. Those proposals receiving approval are incorporated into the State Development Plan, which is only part of the National Plan. Though decision on these proposals is already made at the SAC, still final approval for them comes from the Supreme Council, which brings up the matter with the Council Negri or passes it to the NAC to be brought up in Parliament.

Nearly all Government Departments, whether State or Federal, have representative (Divisional Heads of Departments) in all the **Five** Divisions in Sarawak. In addition in each **D**ivision there are Local Authorities or Councils which have their own responsibilities, function and jurisdiction over certain matters. The Divisional Action Committee prepares and formulates Divisional Development Plans before submitting them to the SAC for final approval. The SAC then considers and has to act within the financial constraint

of the Government. Besides considering those matters which need to pass through the Council Negri, the SAC also considers those which are for the Federal Parliament.

I.4 Implementation of Approved Development Proposals

In Sarawak, responsibility for development is vested in the Chief Minister. The Chief Minister is aided by various State Ministries which have their responsibilities executed through various Departments. The present organisation of the executive responsibility of the State Government is shown diagrammatically in Figure I.1

The following shows roughly the various Government Departments responsible for the implementation of:

Land Development Schemes

- (i) Land and Survey.
- (ii) Agriculture Department.
- (iii) Sarawak Land Development Board.
- (iv) Sarawak Economic Development Corporation.

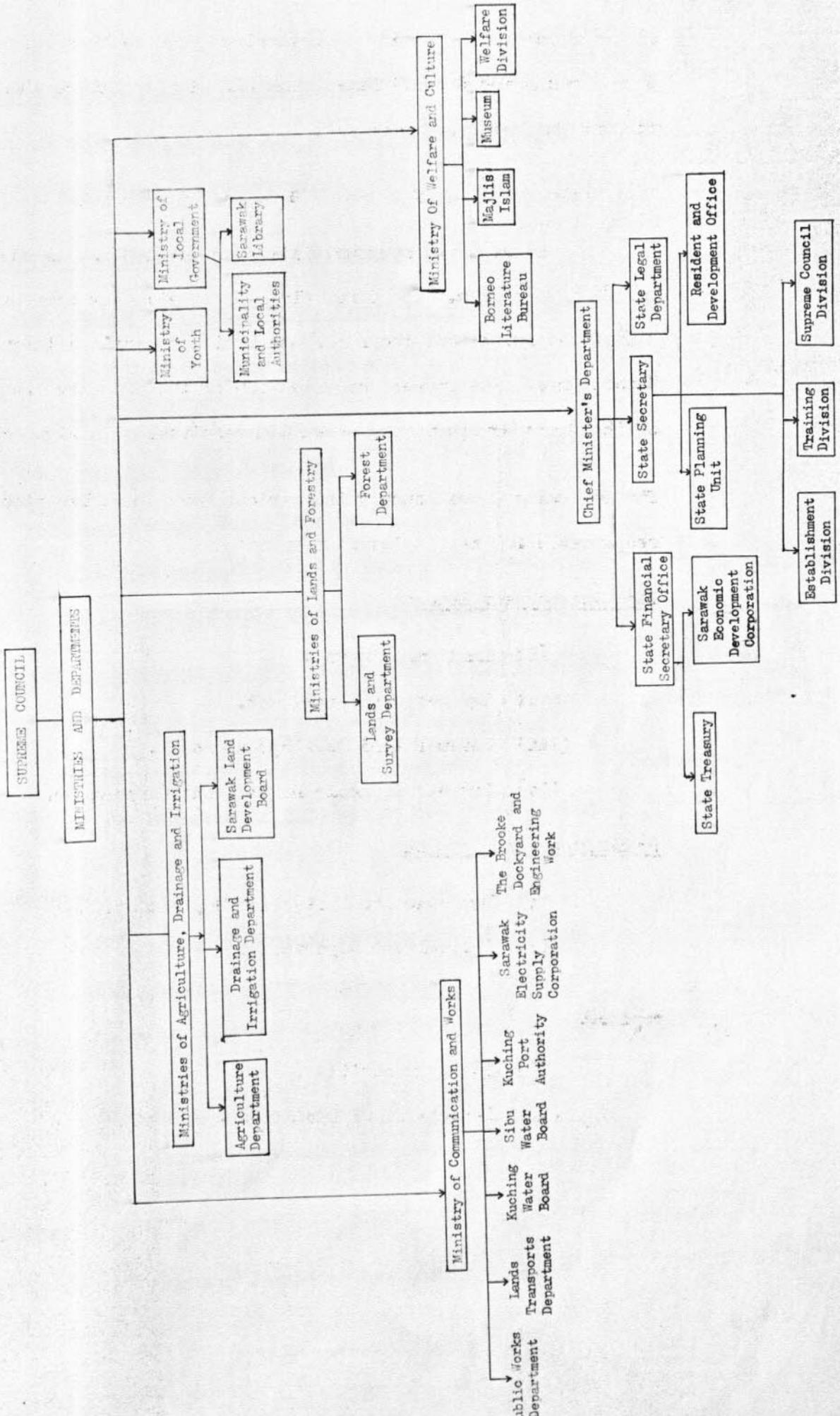
Drainage and Irrigation

- (i) Drainage and Irrigation Department.
- (ii) Agriculture Department.

Schools

- (i) Local Authorities.
- (ii) Department of Education - Federal.

Figure I.1 The Organisation of Executive Responsibility of the State Government.



Hospitals, dispensaries, clinics, etc.

- (i) Medical and Health Department - Federal.
- (ii) Local Authorities.

Utilities and Infra Structural Development

(a) Roads, Bridges, Ports, Airports, wharves and riverwalls.

- (i) Public Works Department.
- (ii) Sarawak Port Authority.

(b) Water, Electricity, Gas.

- (i) Public Works Department.
- (ii) Sarawak Electricity Supply Corporation.
- (iii) Water Boards of Kuching and Sibiu.

(c) Telecommunications, Postal Services and Radios

- (i) Department of Telecommunication.
 - (ii) Department of Postal Services.
 - (iii) Ministry of Information and Broadcasting.
- } Federal

Industrial

- (i) State Industrial Development Committee.
- (ii) Sarawak Economic Development Corporation.

Rural Credit

- (i) Agriculture Department.
- (ii) Sarawak Economic Development Corporation.

Housing

- (i) Sarawak Economic Development Corporation.

I.5 Financing of approved Development Proposals

Development programmes implemented by either Federal or State Ministries, can be financed by Federal, State or foreign funds. Most of the development expenditure in Sarawak is borne by the Federal Government though the State Government also contributes. The funds either from Federal or State, are channelled into the Consolidated Trust Account Development Fund, and each Ministry in the State is allocated appropriate amounts in accordance with the development plan. Withdrawal of such amount is controlled by each Ministries' Permanent Secretary.

GLOSSARY

The Meaning Given to Land Categories in the

Miri Bintulu Study Reports

FOREST RESERVES

Permanent forests gazetted as reserves. They are under the control of the Forest Department and will normally be productive forests, destined to be the principal permanent sources of the country's supplies of timber and other forest produce.

PROTECTED FORESTS

Permanent forests under the control of the Forest Department but in which wide rights are permitted to the people of Sarawak to take forest produce for their own domestic use.

COMMUNAL FORESTS

Permanent forests under the control of the local Administration and set aside to provide the domestic needs of a settled community.

CURRENTLY LICENCED
EXPLOITABLE FORESTS

Forests, other than those included under Reserves, Protected and Communal Forests for which current exploitation licences have been issued.

CURRENTLY LICENCED
REMNANT FORESTS

Forests, other than those included under Reserves, Protected and Communal Forests in which licenced exploitation has been completed.

MIXED ZONE LAND	Land within an area demarcated by Government in which people of all races in Sarawak can obtain land under title.
NATIVE AREA LAND	Land within an area demarcated by Government in which only natives of Sarawak can obtain land under title or native customary rights established legally.
NATIVE CUSTOMARY LAND	Land, on which before the promulgation of the Land Code in 1954, rights of usage had been established under native law and custom. In fact there is no accurate record of the boundaries of such land. For planning purposes this category is taken to be represented by the areas shown as "area of Shifting Cultivation" in the Government of Sarawak map Series T735 Scale 1:50,000 and based on aerial photography of 1963-64.
TITLED LAND	Land held under title in either of the categories Mixed Zone or Native Area Land.
INTERIOR AREA LAND	Land not included under any of the previous categories. It belongs to the State.
STATE LAND	Land over which the State legally holds complete control; including Forest Reserves, Protected Forest, Currently Licenced Forests, and parts not held under title within Mixed Zone, Native Area, and Interior Area Land.

UNENCUMBERED STATE LAND

State Land which has not yet been committed to a permanent use; in effect this category consists of Currently Licenced Forests, and parts not held under title within Mixed Zone, Native Area and Interior Area Land.

DIPTEROCARP HILL FORESTS
OR
HILL FORESTS

Those forest areas which are on mountainous, hilly, undulating or flat land which is not peat swamp, estuarine or alluvial swamp.

SWAMP FOREST OR PEAT
SWAMP FORESTS

Those forests which are growing on peat, estur^aine or alluvial swamps.

APPENDIX III

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MIRI - BINTULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER

THE HUMAN FACTOR IN DEVELOPMENT

An Interim Report for
Discussion with the
Steering Committee

— JANUARY 1973 —

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THE HUMAN FACTOR

IN DEVELOPMENT

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By C. A. SATHER

JANUARY 1973

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THE HUMAN FACTOR IN DEVELOPMENT

1. Introduction

1.1 This paper presents some of the findings of the Study's sociologists. The conditions referred to are primarily those observed at the Lambir rubber planting scheme located in the Study Area, but information relating to other schemes is also included.

1.2 The approach to problems of land development is chiefly through the reactions and point of view of those directly involved and the concern here is with response of settlers and their families, as individuals and members of different ethnic groups, to the incentives, difficulties and opportunities arising from settlement scheme development.

1.3 The criticisms and suggestions contained in this paper are therefore formulated primarily from this viewpoint. Although there has been frequent and current interchange between the sociological team and the agricultural planners of the Study, it still remains to bring the findings of these two groups together in a set of more elaborate recommendations. In this connection reference is made to the working paper on 'Alternative Strategies for Rural Development'.

1.4 However, it is considered preferable at this stage to present to the Steering Committee this paper in order to stimulate consideration within the relevant Government units, as well as dialogue between the Government and the Consultants.

2. Background and Objectives

2.1 Basic to any consideration of land development policy are questions of human potential and need. Among these are questions of what type of person is likely to participate in land development programmes; who should be encouraged to do so; what are these persons likely to want once they become participants; and how are their demands likely to conflict with other development goals. Answers to these questions are clearly important to the design of recruitment programmes and forms of settlement organization that will meet both individual needs and long-term development objectives.

2.2 In discussing the human factor in development, the major concern of the present paper is with the settlement scheme, a type of land development strategy in which land is developed in blocks consisting either of unencumbered land or land to which existing rights have been extinguished by surrender or by adjudication and compensation and settled by relocated populations made up either of outsiders or of indigenous people to whom the land formerly belonged by customary right. Settlement schemes, by requiring resettlement and acquisition of land, are expensive to implement, require considerable social adjustment and heavily indebted those who join them; when centrally managed and dependent on a single crop they may additionally hamper development of initiative and risk taking and tie incomes to a fluctuating world price system. therefore the alternatives, - i.e. the improvement of individually owned holdings through extension services, credit, etc. or the block development of land belonging to existing communities without relocation or transfer of rights, need to be carefully weighed before settlement schemes are planned. On the other hand, settlement schemes offer certain advantages and these are briefly discussed in Section 2.3.

2.3 Settlement schemes are recent in Sarawak and were first introduced under Rubber Planting Scheme 'B' in 1964. The original statement of objectives for the Scheme clearly sets forth the advantages of this type of land development programme, and, as they relate to settler populations, these objectives may be summarized as follows (SDFC paper No.1/65):-

- (a) to move a segment of the population from the subsistence sector to the cash economy;
- (b) to provide land to those who are landless or near landless, and
- (c) to supply amenities to a segment of the rural population which cannot be so supplied under existing circumstances.

2.4 Under certain conditions, particularly with regard to (b) and (c), settlement schemes may be the most effective, or only practical, way to achieve these ends; however, these conditions require careful examination to insure that alternative strategies are not equally suitable.

2.5 Settlement schemes, as they currently exist in Sarawak, are designed, in summary, to meet the needs of several types of presently disadvantaged rural people: subsistence farmers, the landless, and those without access to social and economic services. While these objectives are sound, and continue to guide land development policy, consideration needs also to be given to the contribution which settlers themselves can make toward the realisation of these goals, and future policies should be designed in specific ways so that existing potentialities for economic growth, in the form of skills, education and experience, are fully utilized and the most capable persons are attracted to land development programmes generally.

3. The Settlement Scheme Community

Land development schemes have produced a new type of community, the planned village, and the following paragraphs briefly discuss the social organisation, economic basis, and level of service facilities that characterise these communities as they now exist.

3.1 Social Structure

While new, scheme villages do not, by any means, represent a total departure from existing social systems, and to a large degree settlers have succeeded in recreating in the new environment forms of community organisation, leadership, kin and familial relations characteristic of their home communities. This is not to say that social change and adaptation are not required by life in new settlements, or have not occurred, only that settlers have responded to these demands through existing cultural institutions and values and find in their continuance an important source of security.

(2) New villages pose a greater problem of adjustment to some groups than to others, and, in general, the greatest demands are made of Iban and other longhouse people. To these groups, the scheme not only presents new physical surroundings and patterns of settlement but also an unfamiliar routine of work, leisure and new problems of budgeting and consumption. While most Iban prefer to live in longhouses, these are not always provided, and for families required to live in individual dwellings, the problems of adjustment are likely to be even greater. Indeed, some effects of single family dwelling, such as a breakdown of inter-family contacts and community constraints on social behaviour, may be socially undesirable. Many Iban settlers report that because they can no longer work together on the veranda, or in their fields, they feel less inclined to work and may remain at home, rather than go to their lots, because their actions are unlikely to provoke adverse comment; others are not apt to see them and, if they do, community opinion is no longer so important. On the other hand, settlers who live in longhouses appear to be no more conservative economically than those who live in single-family dwellings. In the future, therefore, consideration might be given to the construction of short longhouses of five or six doors with provision for possible future extension. The leaders of these longhouses might be included in the organisational set-up of the scheme and, as such, could provide an important link between settlers and management.

At the present time individual Iban families, whether they live in a longhouse or not, recognize a community leader (tuai rumah) who deals with minor offenses, settles disputes among his followers and, in general, performs essentially the same role as a traditional longhouse headman. The scheme, as yet, provides no institutionalized alternative. However, the role of the tuai rumah is not clearly defined in the scheme set-up particularly in relation to the management. While this is also true of the headman of Malay settlement communities, it is less serious as the Malay have greater experience with hierarchical political relations above the village level than the Iban do and, in general, feel less estranged from the management.

In mixed villages made up of settlers from different ethnic groups, the members of each group tend to sort themselves out into separate communities and the only multi-ethnic organisations are those, like village councils or school committees, initiated from the outside that have a membership restricted to group leaders. While there is some visiting between families on Hari Raya or Gawai Dayak and settlers meet at work, while shopping, or in the scheme office, there are few close voluntary ties between families of different groups, and the great majority of settlers prefer to live in their own community. This does not mean that mixed settlements are a **failure** or are undesirable. Inter-group relations are generally harmonious and are likely to improve still further as members of different groups gain a better understanding of one another. Integrated schemes, in short, are feasible, if 'integration' is understood in the relatively restricted sense used here.

At the moment the division between settlers and management is great and needs to be bridged. This can be done in a number of ways, by giving greater recognition to existing community leaders, delegating increased responsibility to settler organisations - particularly in matters relating to community affairs -, recruiting settlers and their children into management and staff positions, etc. These possibilities are discussed later on in connection with the closely related problems of social adjustment and settler development.

3.2 Income Levels

Income creation is crucial to the success of a scheme, and in planning, careful attention must be given to selecting crops, deciding on holding size or shares, providing market or processing facilities, etc., so that settlers are assured of a relatively high level of income. On existing rubber schemes inadequate income is a major source of settler dissatisfaction.

Experience with rubber also reveals the economic hazards of total reliance on a single crop, without subsidiary activities or sources of employment, on or off the scheme, for settlers or their dependants. Incorporation of wet-rice holdings in existing schemes may be partial answer, and where possible such holdings might be increased to allow still further diversification and encourage more initiative in the selection of crops, etc. Experience at Lambir suggests that in order to encourage permanent cropping and avoid conflict such land should be available on a long-term basis and surveyed and subdivided before being turned over to settlers. Once allotment are assigned, settlers' rights should be clearly defined and safeguarded to prevent misunderstanding. In addition, the labour available per family may be greater than is assumed, and varies widely from one household to another, so that larger holdings or greater flexibility in holding size may be desirable to prevent underemployment and increase incomes. It might be desirable to increase holding size over time, reducing the number of settlers per scheme, by encouraging unsuccessful settlers to drop out and increasing the holdings of those who are more successful. At Lambir active tappers whose trees have reached maturity, work an average of only 13 days per month, 6 hours per day, suggesting some under-employment of labour even at a rate of one tapper per family, whereas the average number of adults capable of employment per family is 2.5 persons.

Another serious problem is income distribution over time. On existing rubber schemes, a family receives a \$40 per month subsistence allowance debited to its loan account until its trees reach maturity and begin to produce. This amount is insufficient to maintain a household at a reasonable level of productivity and is a serious disincentive to migration. Particularly this is true of just those persons, young couples with small children, who are the most desirable settlers; under present circumstances, young settlers may be forced to sacrifice educational opportunities for their children, if they join a scheme, simply to make ends meet. This problem is a serious one, and most settlers report that low incomes and the absence of meaningful work during the period that immediately follows their settlement on a scheme is a highly discouraging experience. Moreover, it lays the basis for a later pattern of labour instability and possible non-residence.

A third problem arises in connection with indebtedness and loan repayment. Monthly average incomes from rubber tapping for Phase I holdings at Skrang Land Development Scheme are between \$50 and \$60 (Tawi P, 1972). At Lambir they are roughly \$75 for fully producing lots. The average loan debt on both schemes is over \$6,000 per settler. While incomes are increasing slightly, they are still relatively low given this scale of indebtedness. In addition, loans are subject to 7.5 per cent interest compounded annually. This brings average debts, minimally, to over \$8,000. Given the present terms of repayment - 10 per cent of rubber incomes - such debts can never be repayed by most settlers. Besides creating permanent indebtedness, repayment deductions are likely to depress incomes still further and make it impossible for most settlers to realise an immediate improvement in income upon moving onto a scheme. Moreover, settlers are likely to discover that with deductions the amount they are paid for their rubber is less than that received by independent farmers, and, as a result, they may feel victimised or seek outside buyers.

In this connection there is also a serious information problem, and many settlers, particularly Iban at Lambir, are unaware of the fact that their house and subsistence allowance are debited to their loan or, if they know this, doubt that they will be asked for full repayment.

Finally, on ethnically mixed schemes, like Lambir, there are significant differences in income between ethnic groups. For most Malay settlers rubber is tapped by the wife or other dependants as a supplement to the family's main earnings which come from casual or permanent wage employment off the scheme. Few Iban, by comparison, have access to outside employment with the result that the economic position of the two groups is very different. Chinese settlers, who generally have the clearest understanding of the economic terms of scheme entry, are likely to feel that their holdings are hopelessly indebted and insecure. Like Malay settlers, they therefore often turn to outside employment, if they remain on the scheme at all.

3.3 Services

The availability of social, health and educational services is a major incentive for joining a scheme and these facilities are heavily used. Special consideration should therefore be given to the spatial concentration of schemes, as was planned in the original formulation of Rubber Planting Scheme 'B', so that they can sustain secondary schools, permanent clinics, and so on, - in short, provide an even higher level of service facilities than now exists. In this way, land development programmes can contribute to eliminating disparities between urban and rural life.

In general, settlers appreciate what has been done for them in this regard and point to primary schools, maternity clinics, piped water, visiting medical teams, and so on as features of settlement life they like best. Improvements, of course, are possible and two features of settlement life are sources of widespread dissatisfaction: cooperative stores and housing. Regarding the first, it may be preferable to open schemes to licenced privately-owned shophouses, or to settler owned scheme shops, unless the organization of cooperatives can be improved. As to housing, settlers generally feel that the house they have been sold is too expensive (\$2-3,000), too small, constructed in a style that they do not appreciate or is so badly made that it will not outlast the mortgage. In an unpublished report on the Triboh Scheme (Dixon, 1971), it is noted that most families construct at their own expense an additional house on their rubber lot, which a full 70 per cent prefer to the house built for them in the scheme settlement. This suggests that settlers might be allowed to build their own houses, being provided only materials, minimum specifications and possibly skilled carpenters for technical advice, although the practicability of this must be carefully examined beforehand. As a more immediate solution, the present cumbersome restrictions on making improvements to existing dwellings should be relaxed in order to encourage a greater sense of ownership and better standards of maintenance.

4. Settlers

4.1 Background and Selection

The objectives of existing settlement schemes have already been outlined in Section 2.3 and these define the types of settlers, which schemes are meant to attract. What is needed is a thorough assessment of the potential settler population as defined by these objectives. The extent of landlessness, overuse, or the degradation of land under shifting cultivation through too frequent clearance; remoteness of farm families from markets, etc. need to be measured and areas of highest priority identified. Until such an assessment is made and potential settlers can be identified, and reached through an effective programme of publicity, schemes are likely to face a shortage of active applicants.

At the moment communication is a serious problem. In addition to publicity itself, and, perhaps, even more important, is the accuracy of information about scheme life that is conveyed to potential settlers. Many accepted settlers are disappointed to find scheme conditions different than they had imagined or were led to expect. To deal with this settlers themselves might be used to recruit others and visits to a scheme might be arranged for accepted applicants prior to permanent settlement together with an orientation course in which the terms of scheme entry are fully described. At Lambir those with first-hand knowledge of the scheme were generally able to make a more rational decision, and while many withdrew from the scheme, those who chose to take up residence are generally more satisfied than those who came without prior knowledge.

Finally many settlers are too old by the time they enter schemes; at Lambir over a third of all settlers, including those whose trees are still immature, are over 50, and a large percentage will have retired from active labour before their loans can be repaid, if repayment is possible at all.

4.2 Reasons for moving to a scheme

There are three major reasons for migration:

- (a) Landlessness or ownership of land that is uneconomical to cultivate.

This reason is mentioned by settlers of all ethnic groups.

Prior to moving onto the scheme most Malay settlers were semi-urban wage labourers and, in addition to a rubber lot, some were attracted to the scheme by the possibility of acquiring a house from which they could not be evicted where their children might remain to care for them in their old age. A number of Iban settlers, in addition to having no land or inadequate land to support their families, sacrificed their individual interests in that by moving to the scheme they relinquished land in their original longhouse for the benefit of kinsmen left behind.

- (b) Large family size. Having a large number of dependants to support may also be an important consideration, although few settlers mentioned it explicitly as such. This is particularly true of Malay settlers whose mean family size at Lambir is 7.2 persons. While Iban families are considerably smaller (4.9 persons), this is due partly to the fact that they split, particularly three - generation families, in order to be eligible for a maximum number of plots when entering a scheme.

- (c) Low or irregular income. As was noted earlier (3.2), most Malay settlers continue to hold outside employment and scheme earnings are viewed primarily as a source of supplemental income. Most Iban, on the other hand, found farm incomes inadequate in their home areas, and many were already migrants from the countryside who were unable to find other forms of steady employment before moving onto the scheme.

A final factor is security. The interest of Malay settlers in acquiring a house is partly related to their concern with being looked after when they are too old to support themselves. In addition both Iban and Malay feel a strong sense of obligation to pass onto their descendents an inheritance and scheme land may be important for this reason even to those who are relatively urbanized. Some settlers feel that by moving to a scheme their welfare is now in the hands of the government and they can expect to be looked after.

4.3 Adjustment to scheme life

Settlers come from various kampongs, towns and longhouses with their own localized patterns of leadership, social organization, and so on, and while these patterns are maintained to some degree, settlers, from the moment they enter a scheme, must also adjust to a new organizational set-up made up of

- supervisory and clerical staff, service personnel; and
- formal and informal settler organizations.

In order to ease the process of adjustment and allow for better use of technically trained personnel on established schemes, settler organizations need considerable strengthening and should be granted more responsibility particularly in the matters pertaining to settlement life. At present most of these organizations are management-sponsored and need to be tied more closely to existing leadership within the settlement community.

Appointment of a Settler Affairs and Settler Development Officer is recent, but those persons and their assistants can make an important contribution along these lines by encouraging the development of such organizations, voicing settler grievances, and, in general, acting as a communication link between settlers and staff.

Most Malay settlers at Lambir have continued in the occupations they held before moving to the scheme and the move is therefore mainly a change in residence and the problem of adjustment is relatively minor. Home communities are generally close enough to allow for frequent visits and most Malay settlers had a reasonably informed idea of what life would be like on the scheme before they took up residence. In comparison, much greater change is required of Iban settlers; they generally come from a greater distance, know less about scheme conditions, and must frequently sever ties with former friends and relatives. Organized activities, such as film showings, are either not present, or insufficiently developed, to overcome the sense of isolation they are likely to feel.

4.4 Factors influencing the stability of settler populations

It is sometimes argued that a major reason for non-residence, poor maintenance of scheme lots or, in general, instability of labour is the previous practice at Lambir of granting settlers immediate title to their land without writing in conditions for its transfer that would prevent abuse of this type from occurring. While contracts must certainly contain conditions, this, by itself, is only part of the problem that schemes face. Conditions, in themselves are no guarantee against abuse, and even when they exist it may be impossible, for political or other reasons, to evict settlers, as experience in West Malaysia shows. To successfully attract settlers, and satisfy their demands, schemes must be able to produce a reasonably high level of income and be sufficiently flexible to accommodate changing market conditions and future population growth. At Lambir, many settlers are not working their rubber lots because it makes no economic sense to them to do so, given the existence of other alternatives, and what they see as the long-term future of rubber production. Moreover, many feel that the scheme holds out little opportunity for themselves or their children, except as a source of minimal income to fall back on, should all else fail.

In fact, the situation with regard to titles appears to be much more complex than it is sometimes assumed to be, and many settlers at Lambir have either not received their titles or regard them as insecure. The latter view is particularly common with Chinese settlers, some of whom argue that the chief reason for non-residence (as well as for resignation from the scheme) is not that settlers received title to their land, but, on the contrary that, because of restrictions on loan repayment, clear titles are unobtainable, and they are, consequently, reluctant to invest their time in developing land to which their rights are ambiguous. They see little reason for describing as 'theirs' land which is permanently indebted, must be worked under supervision, and over which they have no control of the crops grown or the way they are marketed. All currently resident Chinese settlers indicate that they would welcome restrictions reserving their land for agricultural use in order to prevent it from being lost to speculators. Most feel that such restrictions, plus careful screening of applicants, would satisfactorily prevent abuse. On the other hand, the present situation, so far as titles are concerned, appears neither to define settlers' rights with any certainty nor grant the Land Development Board unequivocal power to evict settlers.

A major attraction of existing schemes is the possibility of acquiring a house and land (see 4.2). The whole idea of land settlement hinges on the geographical mobility of people, and land and the need for land has been a powerful motivating force in past migration (5.1). In this connection, an estate-type scheme, organized on a share-holding basis, is likely to face a considerable problem of settler recruitment, however desirable it might be as a source of foreign exchange or a basis for future industrial development. In addition, the rural population of Sarawak, in contrast to West Malaysia, or even Sabah, has had little experience with estates or the highly managed work regime that estates imply. Lack of independence is, therefore, likely to be another disincentive of estate development. Under existing circumstances, with few alternative employment opportunities available, unstable incomes as employed labourers, and the lack of pensions or other retirement provisions, concern with land among the existing rural population is rational. On the other hand, land is not the only factor that may cause rural people to move; in the Baram District, for example,

interior people are moving downriver, in some cases out of relatively land-rich areas into those of marginal agricultural potential, because of the attraction of wage employment, easier travel, access to markets, schools, and other amenities. However, if settlers are not to be offered land, the objectives of land development are changed and alternative incentives must be provided.

4.5 Settler Development

At the moment existing schemes offer too few opportunities for the second generation. To older settlers, whose children are reaching maturity, this is a matter of genuine concern. At the present time, with undivided inheritance and a high birth rate, settlement schemes are generating an excess work force resulting in underemployment and the out-migration of landless dependants. While part of this force might be absorbed in future schemes, the degree to which this is possible is limited by the rate at which new land can be opened for settlement. Moreover, it may be socially undesirable to absorb all of this growth internally, even if it were possible, in as much as the purpose of schemes should be to broaden and equalize, rather than restrict, opportunities. Therefore careful thought should be given to subsidiary employment, including entry into scheme management positions, and planning should be done with consideration to total regional development and the creation of economic opportunities, both off and on schemes, throughout all sectors of the economy.

5. Migration

In order to make the movement of people onto schemes easier, a settlement board might be established with responsibility not only to screen potential settlers but also to create a labour force drawn from newly accepted applicants to use in clearing and developing future schemes. In this way newly accepted settlers would be provided employment and receive an income until their scheme holdings become productive and can absorb their labour. Training might also be undertaken during this time and settlers given an opportunity to adjust to settlement conditions. If labour demands warrant it, employment might also be offered to dependants of established settlers.

5.1 Attitudes toward movement

In Iban society there exists a well-developed tradition of migration, in the form of bejalai (to journey for the purpose of prestige or material profit) and pindah (to move permanently as a family or community), that continues to play an important role in the movement of families to scheme settlements. While many older people are unwilling to leave their longhouse, younger families can and do move, and one of our findings from Lambir is that most Iban settlers are already migrants before they decide to join a scheme. Table 5.1 shows the place of birth of Iban household heads and the geographical spread of present migration.

With Chinese and Malay settlers there appear to be somewhat greater obstacles to movement, particularly in the latter case. Malay migration at Lambir is restricted largely to the surrounding area as shown in Table 5.2, and it may require a reorientation in values to alter this pattern. The lack of scope for individual initiative built into existing schemes is a strong disincentive to Chinese settlers many of whom have experience in commercial farming. A more attractive programme to such persons would be one that makes land available for agricultural development, perhaps on a long-term lease basis conditional on development, but leaves the choice of crops and so on to the settlers themselves. While such a programme might be most attractive at the moment to Chinese settlers, others could also be drawn in if it were tied to a system of training and farm extension.

TABLE 5.1 PLACE OF BIRTH OF IRANI HOUSEHOLD HEADS

Community leaders (<u>Thai Runah</u>)	Second Division				Third Division				Fourth Division			Total household head by <u>Thai Runah</u>					
	Saribas Lapor	Bt. Undop Pantu Antu	Lubok Saratok Skrang Banting	1	Saribas Oya Rejang	Bt. Kapit Entabai Machan Sarikei Kanowit	Tatau Bintulu Bakong Miri	1	1	1	1		1				
Spitt	1			1	13	2	1						21				
Kiroh			1	4	1	2	5	1	3	1	2	1	23				
Anding	5				1							1	7				
Ka Ju		4	1	9	1	1				1	2	1	22				
Lamai			10	1	1								15				
Mitoh			10			3							13				
Bangrang						4					2		6				
Totals	6	1	4	1	29	2	5	1	3	17	14	2	3	1	2	2	107
Percentage of total	46												40	14			

Table 5.2 Place of birth of 'Malay' household heads

Ethnic Group	Fourth Division			Third Division		First Division	Total	
	Miri	Baram	Bintulu	Mukah	Sibu			
Melanau			1	3			4	
Kedayan	5						5	
Narum		2					2	
Miri Malay							13	
Malay					1	3	4	
Totals	18	2	1	3	1	3	28	
Percentage of total	75					14	11	100

5.2 Existing patterns of migration by ethnic community

Iban migration onto existing schemes is largely by groups under a recognized leader. While there is some movement of individual families, these persons are usually among the original followers of a leader already settled on the scheme or, if not, quickly ally themselves with such leaders once they take up residence. While leaders exercise little real control over their followers, their role in mobilizing migration is significant and needs to be taken into account in designing recruitment policies.

Iban out-migration is well established and frequently involves movement over long distances. At Lambir 46 per cent of resident Iban settlers are from the Second Division, 40 per cent from the Third Division, and only 14 per cent from neighbouring areas of the Fourth Division. This is shown in Table 5.1.

What is significant is that such migration is rarely direct from the settlers' home area. Except for schemes such as Skrang, where settlers were relocated in intact or partially intact communities, most settlers are migrants, and have already left their home area in search of land, work, or for other reasons, prior to their arrival on a scheme. In regard to voluntary migration, then, potential settlers are most likely to be persons who are already detached from their traditional homes. Moreover, in moving to a scheme, they often come under a tuai rumah who is not necessarily a leader from their own area, and the groups that take form as a result frequently have a scattered geographical origin (see Table 4.1).

In contrast, Malay migration is mainly over short-distances and ties with friends and relatives left behind are usually maintained. At Lambir many Malay settlers first learned of the scheme, and were persuaded to join, due to the presence of resident kinsmen. Consequently the Malay feel less isolated, and, although ethnically heterogeneous, tend to be more unified than the Iban, and internal subgroupings have much less social importance and are not so great a hindrance to cooperation. Islam is also an important unifying factor. Malays also have higher incomes and greater access to jobs off the scheme and so are able to travel more and maintain a wider field of social relationships generally. Resident Chinese settlers are either Hakka or Foochow and are generally the least exclusive group, although the two dialect communities have their own leadership and keep largely to themselves.

6. Conclusion

Settlement schemes, in conclusion, need to be seen against alternative strategies for rural development. From the viewpoint of the individual participant a major disadvantage of existing schemes is their lack of flexibility. While highly managed schemes may be desirable as a way of improving the status of the currently disadvantaged sector of the rural population, they hold out little attraction for others, and more flexible programmes appear to be necessary in order to involve those who are especially able to contribute to economic growth because of education or previous experience.

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MIRI - BINTULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER
DEVELOPMENT
STRATEGIES

An Interim Report for
Discussion with the
Steering Committee

— DECEMBER 1972 —

HUNTING TECHNICAL SERVICES LTD.,
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MIRI-BINFULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER

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By C. J. MATHIESEN

S. JORGENSEN

DECEMBER 1972

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CHAPTER 1

1. SUMMARY AND CONCLUSIONS

1.1 Purpose of the Report

This interim report is a revised and continued edition of an earlier working paper which was used, together with other papers, as a basis for the briefing of the State Action Committee in Kuching and members of the EPU staff in Kuala Lumpur. The report contains ideas and considerations resulting from these discussions and from deliberations in Steering Committee and Task Force meetings. The purpose of this report is to present a basis for a discussion between the Government, (represented by the Steering Committee,) and the Consultants of certain main aspects of development in the Study Area during the period 1971 to 1990.

The aspects are:

- (a) how large should the 1990 population of the Study Area be; or vice versa how extensive should the development efforts be;
- (b) how should the production and occupation structure develop;
- (c) where in the Study Area should the development be undertaken and the population be settled;
- (d) which measures and actions can be applied to lead the development in the desired direction.

It has not been the purpose of this report to deal with all relevant subjects of these aspects, but it has been found appropriate, at this stage, to initiate a discussion on development strategies based on information now available.

1.2 Basis of the Report

The considerations and calculations are based on data obtained by the Consultants through travelling throughout the area, from interviews and conversations with Government officials and other influential persons, from previous reports and official statistics. Some of the calculation results are obtained by applying certain planning keys, such as the relation between total population and labour supply, and between basic and derived employment. These planning keys are described in special working papers which are mentioned in the reference list. Some of these papers will be subject to further considerations following the expected discussion on this report.

1.3 Conclusions

No attempt has been made to come to very specific or firm conclusions; the primary purpose of the report has been to raise relevant questions for discussion. In accordance with the directions of the Terms of Reference agricultural development has been given high priority and the starting point for the considerations has been the potentials which were tentatively identified in the Zonation Plan. A full utilisation by 1990 of all the 860 000 acres of land assessed as possibly suitable for agriculture within the Study Area would alone lead to a population growth, in the Area, of seven percent annually, which would result in a fourfold increase in population by 1990. This would imply that more than half the total population increase of Sarawak during the period 1971 to 1990 would be accommodated in the Study Area. Unless a major in-migration from West Malaysia could be considered an appropriate issue, this development rate seems to be unrealistic. Therefore two other situations have been considered which would result in lower population growth rates, namely four percent and five percent annually.

For both of these growth rates an occupation structure has been worked out. These structures are not forecasts of expected events but are illustrations of two situations among many which could occur. The purpose of presenting them is to give a basis for discussions on such questions as: are these situations desirable?; are they realistic?

The 1970 population of the Study Area was roughly 12 per cent of the total in Sarawak. The theoretical situations presented would result in the Study Area's percentage of the total population rising by 1990 to 15 percent and 18 percent respectively. In both the situations employment within all the main sectors of production; agriculture, forestry, manufacturing and services (private and public) is expected to grow. However, agriculture and services are expected to decline relatively during the 20 year period while forestry and manufacturing are growing. This trend is shown in Table 1.1.

TABLE 1.1

	<u>Occupation by Main Groups</u>		
	Percentage of Total Occupied Persons		
	1970	1990 (at 4% growth rate)	1990 (at 5% growth rate)
Agriculture	53	48	49
Forestry	9	13	13
Manufacturing	14	20	19
Services	24	19	19
Total	100	100	100

The basis for these hypotheses are the ideas that agriculture would be modernised not only by planned development of new land, but also by improvement schemes in the existing Native Customary Lands; that forestry would be developed as a basis for a new and strongly expanding timber and wood processing industry; that manufacturing would be developed not only for processing local products, but also for supplying the growing population and enterprises with various goods. The manufacturing could perhaps also extend to industries of a more general character, such as components for sophisticated machinery and equipment.

The industrialisation would need to be based on a deliberate Government policy and positive measures would be needed with respect to attracting industries by investments in infrastructure such as roads, power supply, building sites, housing, hospitals and by training of an adequate labour force. A particular problem facing development in the region is its transport connection with the world outside. Because this problem is closely connected with transport development throughout Sarawak, it is appropriate for the regional problems to be considered as part of an overall development of sea ports, airports and trunk roads.

The distribution of population is influenced by a number of factors; for example, nature largely decides the location of those who rely for a living on agriculture, forestry, mining and oil extraction. But so long as these resources are not fully utilized, priority in developing them further can be given to selected areas thereby controlling, to some degree, the distribution of growth. The same holds true with respect to location of urban areas and urban productions.

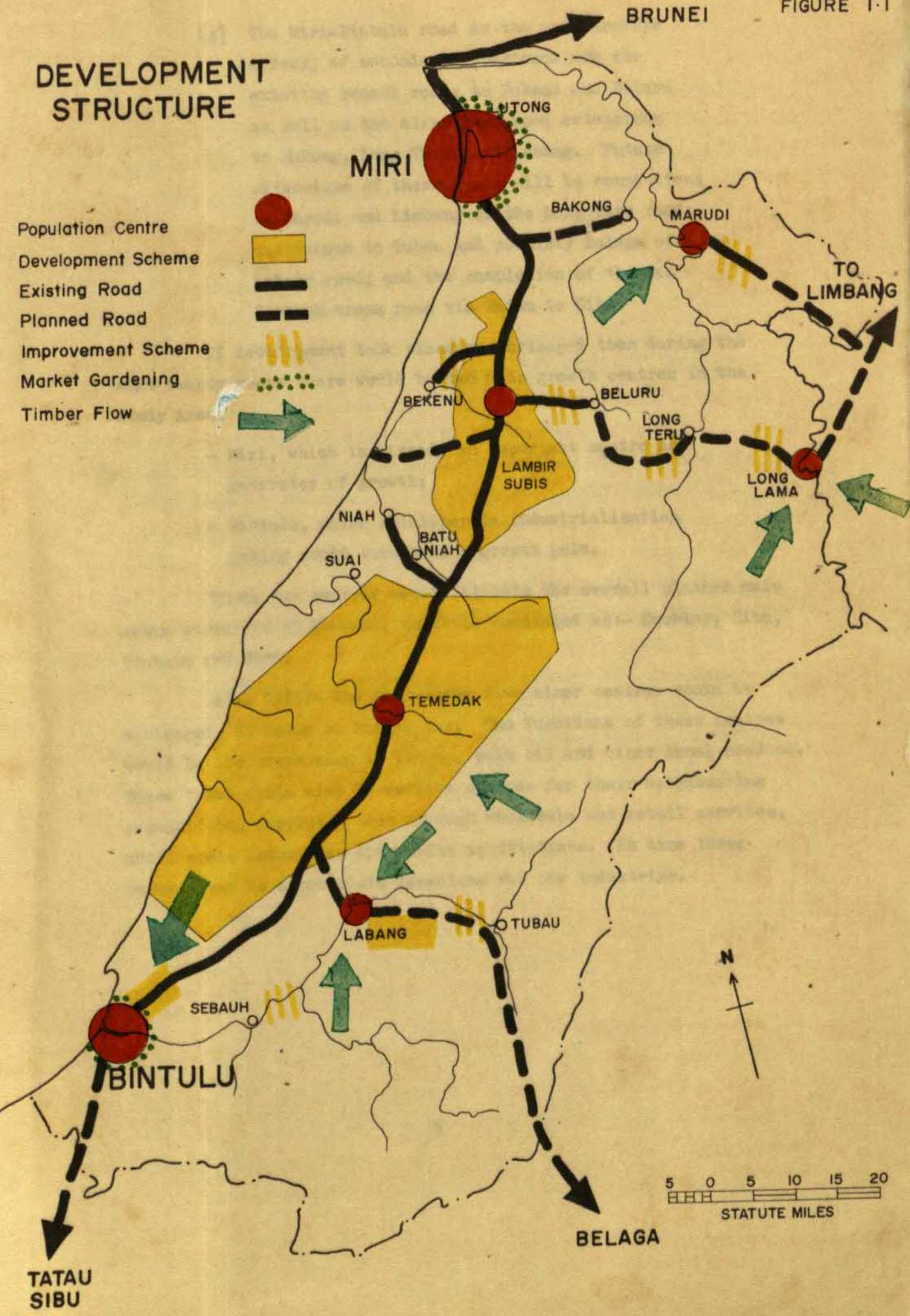
In so far as deliberate influencing of location is possible there are two, sometimes conflicting, goals; efficiency of operation and equality of opportunity within the region. The demand for efficiency may lead to a relatively concentrated development, while the demand for equality will lead to a more dispersed development. A method to combine the two goals would be to concentrate the development in a limited number of growth poles, each of which could develop sufficient efficiency and create a congenial environment for modern production while also giving a large number of people access to employment opportunities and services of the centre. The conclusions if this fundamental philosophy is applied in the Study Area are summarised below:-

Geographically the development structure of the Study Area would be as shown in Figure 1.1, and would consist of:-

- (a) The main industrial and service development in Miri and Bintulu primarily based on oil, natural gas and timber.
- (b) Large scale agricultural development schemes, mainly but not wholly, on State Land around the Miri-Bintulu road in the area delineated in the Zonation Plan for the commencement of soil surveys. Another concentration might be in the Labang/Tubau area.
- (c) Agricultural improvement schemes located mainly on Native Customary Land (if it is found suitable) around Marudi, Long Lama, Beluru, Bekenu, Sebauh and Labang.
- (d) Immediate timber industrial development in the Temedak area (named after a nearby hill), Labang and Bintulu based on the logging of hill forest areas identified by the FAO Forest Investigation Team as Unit 2.
- (e) Later timber industrial development in Long Lama and Marudi. The former based on the logging of FAO Unit 7, the latter on the peat swamp forest west of Marudi.
- (f) Market gardening around Miri and Bintulu.

DEVELOPMENT STRUCTURE

- Population Centre
- Development Scheme
- Existing Road
- Planned Road
- Improvement Scheme
- Market Gardening
- Timber Flow



5 0 5 10 15 20
STATUTE MILES

(g) The Miri-Bintulu road as the main traffic artery; of secondary importance are the existing branch roads to Bekenu and Beluru as well as the already planned extensions to Bakong, Long Teru, and Labang. Future extensions of these roads will be connections to Marudi and Limbang of the Long Teru road; extensions to Tubau and possibly Belaga of the Labang road; and the completion of the Pan Sarawak trunk road via Tatau to Sibiu.

If development took place as envisaged then during the next twenty years there would be two main growth centres in the Study Area:

- Miri, which is already an important centre and generator of growth;
- Bintulu, which a deliberate industrialisation policy could turn into a growth pole.

These two centres would fit into the overall planned main urban structure of Sarawak, which is envisaged as:- Kuching, Sibiu, Bintulu and Miri.

Also within the Study Area five minor centres could be envisaged, as shown on Figure 1.1. The functions of these centres would be the processing of timber, palm oil and other local produce. These towns could also be service centres for their neighbouring populations, supplying them through wholesale and retail services, small scale industries and public institutions. In time these centres may be appropriate locations for new industries.

The ideas presented in this report will influence the course of the second phase of the Study which largely consists of a semi-detailed master plan for 250,000 acres and detailed project plans for 50,000 acres. The Terms of Reference for this Study indicate that the second phase should deal primarily with unencumbered State Land preferably in one or a few contiguous blocks. However, present thinking confirms the ideas presented in the Zonation Plan and favoured by the Steering Committee, that development should take place simultaneously on State Land as well as on already cultivated land, mainly Native Customary Land. Possible locations for these developments are roughly indicated in Figure 1.1 and are further detailed in a report now being written on "Alternative Strategies for Rural Development". In that report it will be suggested that detailed development plans are produced of representative pilot areas on Native Customary Land, thus providing examples of development approaches which could serve as a guide for extending the techniques to other similar parts of the Study Area and possibly the State of Sarawak. This approach may call for a review of the text of the Scope of Work concerning the second phase of the Study. It is necessary to find an interpretation which meets the needs of the Government for planned schemes to implement soon and guidelines for long term development yet, at the same time, falls within the stipulated services of the Consultants.

CHAPTER 2

THE PERSPECTIVE PLAN

The Terms of Reference for this Study state that a Perspective Plan should be prepared covering a 20 year period for all relevant aspects of development such as population, production, trade, finances, settlement patterns, transport demand and administration. However, neither the concept of a Perspective Plan in itself nor the wording of the Terms of Reference give a detailed and unambiguous guideline to indicate the character, purpose or use of this planning tool.

Generally a perspective plan can be regarded as a document setting out over-all targets for economic and social development, including a target rate of increase in total production in order to employ, nourish and supply with goods and services the expected future population of the plan area. The plan may then elaborate these general elements in more detail for various sectors of production, private and public consumption, investments etc.

However, a long range plan of this kind will be operating in a sphere of uncertainty. Therefore, certainty and exactitude should not be considered the primary qualities of long range planning. What is more important is the establishment of priorities for different undertakings and the maintaining of consistency in the various perspectives shown in the plan framework; consistency between available resources and the ideas and goals of future living standards including social services, sanitation, environmental amenities etc.

The total planning process can be illustrated diagrammatically as in Figure 2.1 which is divided into three main components:

- I. Establishment of goals;
- II. Programme and implementation;
- III. Control and review.

In a developing society the planning process will be continuous; changes will need to be made as new resources are created, new and improved information obtained and new ideas and wishes developed. In Figure 2.1 this continuation of the planning process is indicated by the vertical arrow between the main boxes. Only the first of the boxes, Establishment of Goals, is concerned with Perspective Planning. In this

process, wishes, ideas and aspirations of the people are weighed against the available potentials and acceptable means of obtaining them. Through this process an attempt is made to reach realistic objectives, that is objectives which can be achieved by a number of inter-related projects, the implementation of which can be carried out within the constraints governed by natural resources, manpower, financial funds etc using measures which are acceptable to the Government.

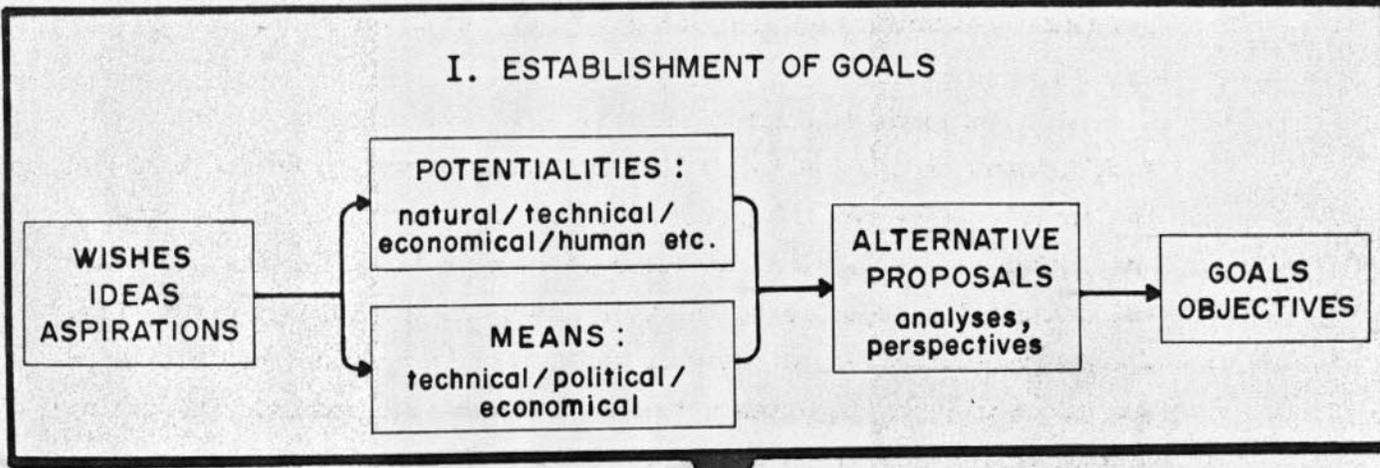
Perspective planning should be considered a tool for establishing contact between the policy and decision makers on one hand and the investigating and analysing advisors or consultants on the other; the latter people working out alternative ways to tackle the problems and achieve the objectives, in other words the development strategies. There may well be many strategies combining the various possible means and giving varying importance to the different objectives. The policy makers must decide which of the strategies they prefer.

There is no doubt that the future social and economic pattern of the region can be influenced by human decisions and efforts to implement these decisions. At the same time these decisions and the efforts to implement them must be kept within certain limits to be realistic. The limitations are set by factors such as the geography and climate of the area, the natural resources, the present level of culture, education and experience. Some of these factors like the last three are only temporary constraints on development, which in the course of time could be overcome, while the first three, although of a more absolute character, could be modified by such means as improved transport or careful regeneration and conservation of certain basic resources. It is part of perspective planning to identify the factors which can be influenced and those which cannot. For instance the present population and its natural growth (i.e. annual number of births less the number of deaths) is a clue to forecasting future social and economic patterns. So are the present settlement and occupation structures. But the future structures can be influenced in several ways:

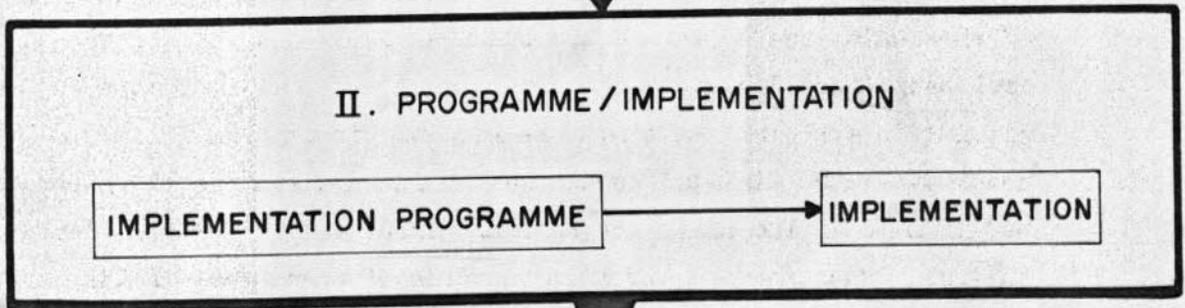
- improved medical care can reduce death rate;
- family planning can reduce birth rate;
- improved exploitation of natural resources or establishment of new manufacturing industries can give incentives for in-migration to the area;

THE PLANNING - PROCESS

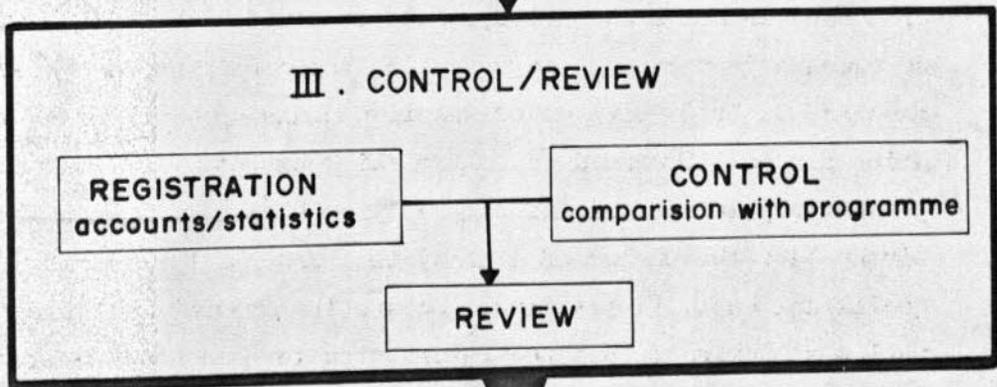
I. ESTABLISHMENT OF GOALS



II. PROGRAMME / IMPLEMENTATION



III. CONTROL / REVIEW



REPETITION OF THE PROCEDURE AS
A CURRENT PLANNING PROCESS

- education and vocational training together with investment in industries can contribute to a change in occupational structure.

However, the prospects of applying these measures will be limited because it takes time to change the attitudes of the population so that the new techniques are accepted, and when accepted it takes time to apply the techniques in the reshaping of the nation in accordance with the desired objectives.

Although financial constraints may be essential, especially in connection with financing import of goods and services for development, they have not been treated here. This report is primarily concerned with real conditions, i.e. quantity and quality of natural resources and the ability to organize human efforts to exploit these to the benefit of the population; not with the monetary system for channeling the movements of goods, labour and services.

The ability to draft alternative realistic future social and economic patterns depends on the quantity and quality of information on relevant development factors. The sources for information are the published official statistics; information from the various public departments and information collected through special investigations. Whereas all the information must be processed and evaluated in order to establish a foundation for assumptions on future development the perspective planning primarily treats the problems in broad outline and round figures and leaves the details for later studies and considerations.

CHAPTER 3

DEVELOPMENT STRATEGIES

3.1 General

The concept of "strategy" in the context of planning is used in several different ways, but as explained in Chapter 2 it is here taken to mean the answer to the question:

- what shall we do to obtain our goals? or
- what will we obtain if we act in such and such a way.

Broadly it is a description of a main line of action and of the results which can be expected from the action. By considering alternative strategies it will be possible to examine various degrees of objective fulfilment, and combinations of different measures and actions that can be applied for obtaining the expected results.

The various objectives of development can be mutually supporting or they can be overlapping and even conflicting. There can be many different means applicable for achieving the goals, but with varying side effects and varying political acceptability

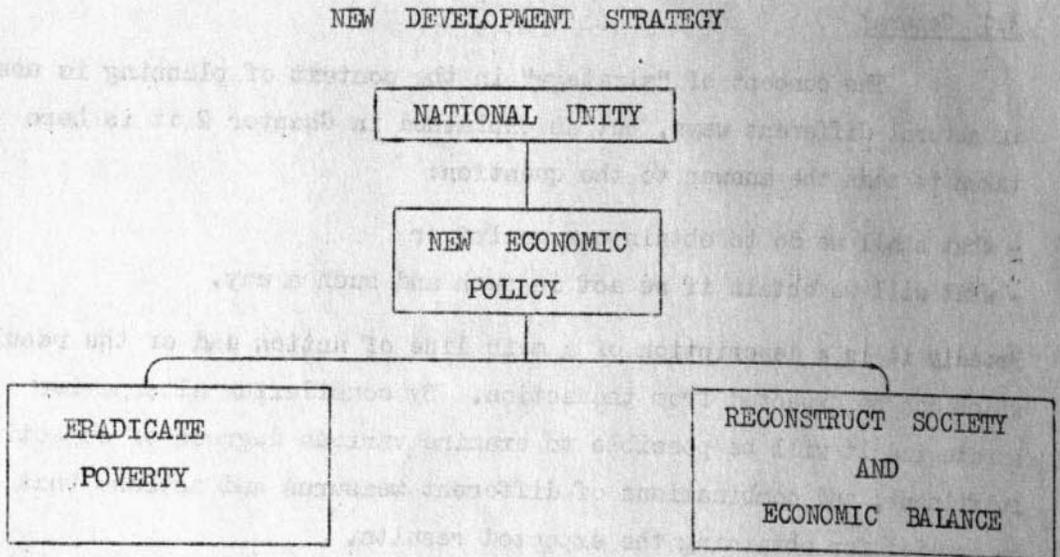
A strategy, therefore, need not attempt to achieve maximum fulfilment of all the separate objectives; that would usually be impossible; but it attempts to coordinate the approaches to the objectives in a balanced way.

When a strategy has been chosen policies and programmes must be worked out as shown in figure 2:1 presenting more specific ways and means to be applied and actions to be undertaken in the near future as concrete steps on the way to the goals.

3.2 The Malaysian National Development Strategy

The national development strategy is laid down in the Second Malaysia Plan (1971-75) and is designated the New Development Strategy. This is a hierarchy of goals, where a goal of lower order is a step to achieve goals of higher order. The lower order goals are more specific than the higher order ones. Figure 3.1 indicates the general goals of this New Development Strategy.

Figure 3.1



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.

The eradication of poverty will be obtained through;

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

The Second Malaysia Plan mentions several policies for raising the income and productivity of low income groups, for example, in agriculture the introduction of new crop cultural techniques, double-cropping, 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 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.

3.3 Development Goals and Strategies for Sarawak

Generally Sarawak identifies itself with the rest of Malaysia and therefore also with the goals and strategies already described. Expressions of this attitude can be found in many official statements, for instance in the Chief Minister's budget speeches to the Council Negri.

3.3.1 Sarawak Development Plan 1964- 1968

The Sarawak Development Plan (1964-68), published in 1963, states a number of objectives, of which several still seem to be valid:

"To improve the farmer's livelihood and make the countryside a pleasant place to live in;

To provide employment for the country's population of working age;

To raise the per-capita output of the economy and to protect per-capita living standards against the adverse effects of a probable decline in rubber prices;

To widen the variety of Sarawak production, emphasising the development of other suitable agricultural products in addition to rubber and also giving encouragement to industrial expansion;

Finally, while stressing the importance of development which will meet production and employment requirements, to improve and expand the social services needed to provide educational opportunities for the rapidly growing school-age population, to extend the public health services over a wider coverage of the rural as well as urban population, and to provide more adequately for rural utilities."

A special feature in Sarawak's production and economy is the shifting cultivation of hill padi. The 1964-68 Plan for Sarawak says that "There is no strategic argument for continuing hill padi cultivation as the fertility of the soil is gradually being reduced by it. If hill padi areas were allowed to revert to jungle and regenerate completely they would have greater potentiality for producing rice in a time of emergency than if they had been farmed continuously. In many areas, where the soil has degenerated, it is likely that the return on labour devoted to hill padi is so small that the price of, for example, rubber would have to fall to a low level before it became a less remunerative crop than hill padi."

The conclusion of the Plan was that the national income would grow by four per cent annually, while the population was expected to grow by 3.2 per cent annually, leaving only a 0.75 per cent annual increase in per capita national income. In the Second Malaysia Plan (1971-75), the national income per capita is planned to grow by a considerably higher amount, namely 3.6 per cent annually with an expected 2.9 per cent increase in per capita purchasing power.

3.3.2 Agricultural Development

The 1964-68 Plan identifies two main types of agricultural development schemes:

- opening up new land for agriculture;
- better use of land which is already being farmed.

For the former type of development planned, settlement, where roads and social facilities are provided in advance, is recommended. For the latter type the Plan states "Every encouragement must be given to the planting of padi on swamps instead of on hills; the steeper hills should be planted with tree crops (rubber) or allowed to revert to jungle, and other varieties of agriculture such as livestock and fruit-growing should be encouraged."

The plan furthermore says; "Again it is clear that the concentration of effort on an area selected as being likely to be capable of responding, is the best way of tackling this problem. For example, the results of the various subsidy schemes for planting rubber, coconuts and padi, and for farm improvement, are likely to be better if these schemes are supported by the work of agricultural extension teams. Furthermore, it is certain that the services of Government staff will be at a premium, and concentrating attention on one area at a time will help to make the best use of the available man-power. To take another example, considerable expansion is proposed in the way of agricultural credit and co-operative marketing. This will be of most use in areas which are advancing agriculturally, and conversely, agricultural improvements will be encouraged and supported by the availability of credit and improvements in commercial arrangements."

Much importance is given to "making the countryside a pleasant place to live in." The Plan says: "With improved standards of farming, it will be possible for a development area to support a fairly dense population, which in turn will make it feasible for Government to provide amenities. This has particular relevance to the native communities changing from hill-padi to more intensive farming. These populations have been especially scattered - and it has therefore been especially difficult for Government to help them - because of the large acreage of land needed to support each family. As they change over to more intensive agriculture, it will be possible for them to live closer together, and development areas should be a means of offering them the advantages of living near (or even in) villages."

Adoption of intensive agriculture will enable the native farmer to get a better income from a smaller area of land, but it still will not enable Government to provide him with amenities unless there is (or will be) a community of sufficient size and density to justify them. The key to this problem is in the layout of the holdings which are to be intensively cultivated and these must, from the outset, be arranged so that such a community can be based upon them. It is in fact impossible to separate the two aspects, and the planning of schemes in areas at present being farmed by traditional hill padi methods must be based on the twin aims -

- (i) to improve the farmer's livelihood by enabling him to take up intensive agriculture; and

- (ii) to make the countryside a pleasant place to live in by providing amenities."

As a means to obtain this it is recommended in the Plan, that many such schemes should involve of redistribution of land holdings.

The goals and strategies contained in the above quotations still seem to be generally valid. Since publication of the Plan, there has been a discussion in the State Government on the adequacy of the Land Code of 1957 as an instrument for agricultural development. A Land Commission convened in 1962 recommended a number of changes, which however did not find sufficient political backing when presented to the Government in 1965. Nevertheless it is still Governments' aim to modernise agriculture and to reduce the practices of shifting agriculture. This is to be achieved through education and persuasion, which implies agricultural extension services, credit facilities, marketing arrangements etc. These matters are further elaborated in the paper being prepared on "Alternative Strategies for Rural Development".

3.3.3 Forestry, Mining, Manufacturing, Trade and Commerce

Parallel to agriculture, a development of the activities mentioned in the heading is foreseen by the Government.

Forest exploitation has been carried out for some time, based primarily on the export of logs. It has, however, been made clear in recent political statements that the wood reserves of the State should to an increasing degree become the basis for local timber and wood manufacturing industries. The recommendations resulting from the FAO forest team's present studies are likely to influence decisively the goals and strategies in the forestry sector.

Apart from the offshore mineral oil and natural gas deposits, Sarawak does not seem to hold mineral deposits of any great importance to the economy. Development of manufacturing industries must therefore be based largely on processing of timber and agricultural products. These industries should be developed gradually from initial simple processing into more and more advanced manufacturing.

It may be necessary, also to look for industries which are not primarily based on local materials or other natural advantages, the so called, - "footloose"-industries. Manufacturing of components for electronics and other complicated and highly advanced machinery are examples. Such industries are particularly sensitive to labour costs, but relatively insensitive to transport costs. Nevertheless with Sarawak's globally remote location compared to the industrial centres of the world, it is not likely that foreign investors would, by themselves, find their way to Sarawak for that purpose. But with more and more industries settling and developing in West Malaysia, it might be possible to induce some of those to locate subproductions in Sarawak. A well functioning transport system is a primary prerequisite for this kind of industrialisation.

3.3.4 Location of Economic Activities

The location of economic activities is, to some extent, a result of natural conditions. Forests and land suitable for agriculture must be exploited where these resources are found; similarly, mining activities must go to the deposits. The selection of areas to be exploited first will be influenced by development of transport systems - and vice versa. However, manufacturing and other urban trades can normally be located where it is considered desirable by the investor or the society.

It is a generally accepted aim by the Federal and State Governments to spread the economic activity throughout the State, with special emphasis on a limited number of well equipped 'growth poles'. In Sarawak, these should be Kuching, Sibul, Bintulu and Miri. These towns will eventually be connected with a main road system; they are already connected by an internal air line system.

3.4 Development Strategies for the Study Area

The development goals and strategies for the Study Area have been broadly laid down in the Terms of Reference, quotations from which are;

"It is the intention of the Federal Government and State Government of Sarawak that this region be developed, primarily to permanent agricultural settlement and large scale forest management, exploitation and processing, and to other economic activities which a close study of the region may show to be viable."

"The plans will encompass public and private investment consistent with financial and managerial resources, and give special emphasis to the urgent need to improve the economic position of the rural population in the State as a whole and minimise rural under-employment and uneconomic practices. This emphasis is to be commensurate with the resettlement of the greatest number of people on holdings sufficient to provide reasonable incomes and to induce incentives for higher productivity and progress either through traditional, but greatly modified and more economic practices, or through the introduction of more modern agricultural systems, depending upon the social inclinations of particular settlement groups."

Agricultural development is clearly emphasised as the central initial theme and forest exploitation as the second major activity. "Processing of timber and agricultural products should be done within the region as much as possible, to form the basis of a future manufacturing industry. The establishment of other industries must follow whenever opportunities appear attractive."

The development of land and creation of employment opportunities will be carried out "to accommodate settlers, the majority of whom are expected to come from the First, Second and Third Divisions, at the same time safeguarding the legitimate interests of present farm communities in the region."

It has been found convenient to discuss development strategies for the Study Area with respect to five main aspects:

- scale of development;
- occupation structure;
- geographical distribution of development;
- policies and programmes for development;
- development in time.

These items are discussed with varying intensity in the following subsections depending on how much attention has been given to the subject so far. As the Study proceeds, considerations will continue on those subjects not yet fully covered.

3.4.1 Scale of Development and Occupation Structure

There is a close relation between these two first aspects; the first is concerned with the scale of development within the Study Area compared with that in Sarawak as a whole. Important factors to be discussed are the number of employment opportunities to be created within the Perspective Plan period, the total number of in-migrants to the Study Area, the use of its natural resources, the acreage of land to be developed for agriculture, the scope of forest exploitation and the total cost of development accruing from this development. The second aspect is concerned with the relative importance of the various main sectors of production, i.e. how many persons will find occupation within agriculture, forestry manufacturing industries, trade and commerce etc.

In the background material, accompanying the Terms of Reference, it was estimated, that the Study Area "... includes approximately 1 500 000 acres of land that is believed to be suitable for agriculture, of which approximately 1 000 000 acres is unencumbered State Land that is not under cultivation at present". These estimates have been modified considerably by the Zonation Plan studies, see Table 3.1, which indicates a total area of land possibly suitable for agricultural development, outside the Lambir-Subis Scheme, of around 863 000 acres, which is less than 60 percent of that expected. The area of totally unencumbered land - i.e. that which is available for almost immediate development and therefore without Native Customary Rights or reservation for Permanent Forest, (categories 3, 4 and 9 in the Table) - is (205 000 acres) or 20 percent of the acreage expected.

TABLE 3.1 ACREAGES OF LAND CATEGORIES IN THE STUDY AREA

Land Categories	Possibly suitable for Forestry acres	Possibly suitable for Agriculture acres	Total acres
1) Hill Forest Reserve and Protected Hill Forest	826 000	144 000	970 000
2) Proposed Hill Forest Reserve	123 500	21 000	144 500
3) Currently licenced exploitable hill forest	120 000	60 000	180 000
4) Currently licenced remnant hill forest	121 500	65 000	186 500
5) Communal Forest	500	NIL	500
6) Swamp Forest Reserve	242 500	NIL	242 500
7) Native Customary Land	372 500	451 000	823 500
8) Titled Land	67 500	42 000	109 500
9) Unencumbered State Land including Interior Area Land	360 500	28 000	388 500
Mixed Zone Land	96 000	36 000	132 000
Native Area Land	194 000	16 000	210 000
Sub-total	2 524 500	863 000	3 387 000
10) Lambir-Subis	21 000	144 000	165 000
Total	2 545 500	1 007 000	3 552 500

The criterion for agricultural suitability has been primarily the topography of the area, as assessed by aerial photographic interpretation, which has taken account of the height of hills and gradient of slopes. The quality and depth of the soil has yet hardly been considered. During further soil surveys it is expected that the 863 000 acres of possibly suitable land will be reduced. However, further investigations into the Study Area may also reveal smaller patches of suitable agricultural land, which have not yet been identified or are too small to map at the scale used, and which in total may be greater than the reduction due to poor soil. To this amount should be added suitable land within the Lambir Subis Scheme not yet developed. It is estimated at around 30 000 acres.

The importance of these figures might be illustrated by a few computations based on rather rough assumptions taken from a number of Working Papers. (see reference list)

- if development is restricted to the totally unencumbered land: 205 000 acres and to the remaining Lambir-Subis area: 30 000 acres; and
- if these 235 000 gross acres correspond to around 190 000 net acres, applying a factor of 0.8 for land being used for roads, villages etc; and
- if one fully occupied person can cultivate 12 acres, then 16 000 persons could be employed on this land, giving a direct livelihood to a total population of around 45 000. This conclusion is based on the following relationship between total population (P) and labour supply (LS), i.e. the number of persons who want to be gainfully occupied:

$$P = LS \times 2.86 \text{ or}$$

$$LS = P \times 0.35$$

In addition, this direct increase in employment would be accompanied by a derived employment from work generated by supplying and servicing the primarily employed persons. This has been estimated at an amount equal to the primary employment. The total number of persons employed by developing the 235 000 acres would therefore amount to 32 000 and the total number of persons having a livelihood would amount to around 90 000. These will not all be immigrants, however, because the natural growth in 20 years of the present population of the Study Area must also be accounted for. At an annual growth rate of 2.7 percent the present population would increase by 80 000, leaving space for an in-migration from other parts of Sarawak of only 10 000. This is not a significant number when considering that the natural growth of population in the rest of Sarawak, during the same period, will have been about 600 000.

This example suggests that any major agricultural development in the Fourth Division aimed at absorbing considerable numbers of people from the rest of Sarawak should therefore be based also on other lands, for example;

- (a) - lands possibly suitable for agriculture within 'Hill Forest Reserves, Protected Hill Forest and Proposed Hill Forest Reserve', (categories 1 and 2 in Table 3.1) which total 165 000 acres. Using the same assumptions as before, the development of these areas would lead to a total employment, direct and derived, of 22 000 persons and a total population accommodated of up to 65 000. This, together with the 10 000 possible net in-migration from the 235 000 acres, gives a total of 75 000 persons who could be accommodated from other parts of Sarawak and accounting for roughly 12 per cent of the increase in population (1971 - 1990) in the rest of the country.

(b) - a better utilisation of the Native Customary Land consisting of an area, possibly suitable for agriculture, of around 450 000 acres. Living within the total area of Native Customary Land, roughly 823 500 acres, consisting of possibly suitable and unsuitable land there are estimated to be 60 000 persons or about 11 000 families. Assuming this whole population was to be settled within the area found suitable for agriculture then each family could have about 40 acres. If in the perspective plan period an average allocation of land of 12 acres per family could be considered reasonable, then the present population occupied with shifting cultivation could be settled on a total area of around 135 000 acres, leaving 375 000 acres for another 140 000 settlers if each family were given the same acreage. These people could be expected still to cater for their own subsistence with elementary goods, so that only a smaller part of their activity would be directed towards the cash or money economy. The derived employment would therefore be smaller, say only corresponding to a total number of 60 000 persons. The total number of people accommodated would then be 200 000, corresponding to 30 to 35 per cent of the population increase (from 1971 to 1990) in the rest of Sarawak.

Adding the figures under (a) and (b) will result in a total accommodation of 265 000 persons, or 45 percent of the population growth (from 1971 to 1990) in Sarawak outside the Study Area. The total population in the Study Area could be presented as shown in Table 3.2.

Table 3.2 LAND DEVELOPMENT AND POPULATION INCREASE

	persons	persons
Population 1970		115 000
- increase from:		
235 000 acres	90 000	
a) 165 000 acres	65 000	
b) Native Customary Land	200 000	
Total increase		<u>355 000</u>
Total population 1990		<u>470 000</u> =====

The total increase would correspond to an annual growth rate of seven percent. More than half the expected growth of population in Sarawak would in this way be accommodated within the Study Area.

This appears unrealistic for several reasons:

- (1) - an extreme strain would be put on the administration and other public agencies in the Study Area;
- (2) - the population growth rate in the rest of Sarawak would be reduced to 1.7 percent annually, with consequently a relatively slow economic development. This would probably not be acceptable and would be counteracted by individual and political initiatives for development of these areas. The conclusion that seven percent growth is unrealistic could, however, be modified by a deliberate policy of in-migration to Sarawak from West Malaysia if conditions in Sarawak, from a national point of view, were considered more attractive for development than in West Malaysia;
- (3) - the shifting cultivators may not be prepared to accept the settling of themselves for the benefit of others on the present Native Customary Land, at least not to the extent envisaged here;
- (4) - However, if they were so prepared, then resettlement and relocation of similar people could take place on suitable lands in the other parts of Sarawak, thus reducing or even abolishing in-migration to the Study Area for the reason of land shortage;
- (5) - as a development of basic economic activities in other sectors, such as forestry and manufacturing must be expected - and is considered desirable - then this would lead to an even higher total growth in the Study Area.

For these reasons calculations have been made, based on estimates of the present occupation structure, presented in Table 3.3, to forecast the possible occupation structure in 1990 assuming two lower rates of population growth, namely four per cent and five per cent annually. The results of these calculations which are given in Table 3.4 imply an in-migration to the Study Area of about 60 000 and 110 000 persons respectively over a 20 year period.

Table 3.3 PRESENT OCCUPATION STRUCTURE⁽¹⁾

	No. of persons	Percentage of total persons
Agriculture		
traditional	21 000	45.6
modern	<u>4 000</u>	<u>8.7</u>
total	25 000	54.3
Forestry	2 500	5.4
Fishing	450	1.0
Manufacturing and Mining	4 000	8.7
Construction	750	1.6
Transport	1 500	3.3
Private Services	4 800	10.5
Public Services	2 000	4.3
Occupation not stated	5 000	10.9
Total	46 000	100

Note 1. Based on data from the 1970 Population Census together with locally collected information.

The traditional or low productivity sector of agriculture, which primarily consists of padi planters, is considered corresponding to only two thirds full time labour supply or 14 000, thus reducing the total full time labour supply to 39 000. 'Occupation not stated', 5 000 persons, have been distributed on the active sectors proportionally. For the sake of simplicity and convenience the above estimates in Table 3.3 have been grouped under 4 headings, as shown in Table 3.4 where:

Agriculture is full time labour supply in agriculture;
 Forestry is forestry and fishing;
 Manufacturing is manufacturing, mining and construction;
 Services are private and public services, including transport;
 Population is total population.

Table 3.4 shows possible future occupation structures in the Study Area. These patterns are not the result of objective calculations, but the figures are the modified results of judgements based on knowledge of a number of details concerning aspects such as soil conditions, FAO's ideas about the future development of forestry, etc.

With an assumed rate of natural growth of Sarawaks' population of 2.7 percent annually from 1971 to 1990, and with the total population shown in Table 3.4, the total population in the Study Area would constitute the following percentage of Sarawaks' population:

	Total population in Study Area	Percentage of Sarawak
1970	115 000	12
1990 at four percent	243 000	15
1990 at five percent	295 000	18

Both population growth rates would result in an increasing importance of the Study Area. This four percent growth rate would imply the absorption into the Study Area of eight percent of the natural growth in the rest of Sarawak; and at a five percent growth rate it would absorb 17 percent.

Table 3.4 shows that all main occupation sectors are expected to grow, but at varying rates. Although agriculture takes nearly half of the total increase in Labour Supply, it is expected to grow at a lower rate than average.

Behind the figures of Table 3.4 lie a number of considerations which could be summarised as follows:

(1) Agriculture

At a four percent population growth rate and with an average number of acres per occupied person as mentioned the increase in agricultural occupation would imply a development of around 75 percent of all possibly suitable state land (305 000 (12 x 20 300 x 1/0.8) acres out of 400 000). Part of this development must be for market gardening, rearing of poultry, pigs, cattle and the like for the supply of a growing urban population and people working within specialised agriculture (e.g. oil palm estates). This local supply agriculture could also be developed on that Native Customary Land which has good access to the relevant markets, thus leaving more State land for development by in-migrating settlers.

Table 3.4 FUTURE OCCUPATION STRUCTURES

	1970			Average growth rate four per cent				Average growth rate five per cent			
	Labour Supply thousand	percent of total	Labour Supply thousands	percent of total	increase in Labour Supply thousands	annual growth rate per cent	Labour Supply thousand	percent of total	increase in Labour Supply thousands	annual growth rate per cent	
Agriculture	20.7	53	41	48	20.3	3.5	50	49	29.3	4.5	
Forestry	3.5	9	11	13	7.5	5.9	13	13	9.5	6.8	
Manufacturing	5.5	14	17	20	11.5	5.8	20	19	14.5	6.7	
Services	9.3	24	16	19	6.7	2.8	20	19	10.7	3.9	
Sub Total	39.0	100	85	100	46.0		103	100	64.0		
Total Population	115.0	-	243	-	128.0	3.8	295	-	180.0	4.8	

The five percent population growth rate would give 9 000 more occupied persons in agriculture; this situation could be achieved partly by developing a greater percentage of state land and partly by a better utilisation of Native Customary Land. This development could be aimed at supplying the growing population, but could also be for production of food for export to large consumption centres, such as Singapore, Saigon, Hong Kong and Japanese cities.

The agricultural development foreseen in both situations assumes a considerable input of extension services, credit and marketing facilities accompanying large scale development schemes. These aspects are further dealt with in the paper on 'Alternative Strategies for Rural Development'.

(2) Forestry

In both situations forestry is expected to grow considerably. The FAO forest team has estimated the total increase in employment in all sectors of timber production, logging, transport and manufacturing, at 30 000 persons. Ten to eleven thousand of these new jobs are expected to be located in the Study Area with three to four thousand in manufacturing, and the rest in logging and transport, i.e. forestry. It has been assumed that the forest industry will expand also in the swamp forests and possibly in Native Customary Land unsuitable for agriculture. Another assumption is that plantations could be developed on logged land not suitable for agriculture.

(3) Manufacturing etc.

The main industries considered are extraction and processing of oil and natural gas; the processing of palm oil and products from other crops, timber and wood; also taken into account are all the different auxiliary productions and mechanical services supporting the primary industries, and finally the supply of some manufactured goods to the population in the Study Area. Building and construction activities are expected to increase considerably as well as small scale industries, some of which in the course of time may develop to supply larger markets. Processing of food for export may become important. Industrialisation on a scale indicated by the figures in the Table assumes a deliberate policy by Government which would include development of urban areas, increased transport facilities and an adequate education and manpower training programme.

(4) Services

This sector consists of a number of private and public functions which are dependent on the level of economic activity and the income level within an area. Both these factors are expected to grow; consequently this sector must also grow. The growth rate, however, has been kept on a rather moderate scale in the table because the sector is considered at present to employ more people than necessary for carrying out its functions. By increasing efficiency a higher output could be obtained with a moderate increase of manpower. The public sector will also expand but not necessarily parallel to the growth of population.

Generally the pictures shown by the two situations are a moderate relative decrease of agriculture from 53 per cent in 1970 to 48 or 49 per cent in 1990, and a corresponding increase in forestry, so that the share of total labour supply accruing to these two sectors is practically unchanged: 62 per cent in 1970 and 61 or 62 percent in 1990. Accordingly the urban sectors manufacturing and services, in total are also unchanged. This may seem to be meager result from a modernisation process. However, there are explanations for this apparent lack of change:

- (1) The reduction factor for underemployment having been applied to the present agricultural population means that in fact around 7 000 more persons than are indicated in Table 3.4 are absorbed into the agricultural and forestry sectors which together count for 68 per cent of the presently occupied persons;
- (2) it is assumed and expected that low productivity agriculture will be partly replaced by more up-to-date and productive cultivation practices;
- (3) development of agriculture and forestry has been given high priority in the Study Area by the Government;
- (4) forest occupation may have been overestimated at the cost of manufacturing and services;

- (5) the calculations assume full employment of the total Labour Supply, which could be considered unrealistic and unnecessary. An average unemployment of five percent would reduce the employment in 1990 by 4 000 to 5,000 persons, and accordingly also reduce the necessary investments in new work places.

Generally therefore the situations represented in table 3.4 imply a considerable development and modernisation of the Study Area. If the soil surveys prove the soils to be largely of good quality, there would seem to be sufficient state land to cater for the higher development alternative (five percent growth rate) and there would still be considerable reserves in the Native Customary Land for the future. The State might be able to initiate acceptance, by the shifting cultivators, of settled agriculture on only part of this land by combining, as a bargain with the people, the building of access roads, social amenities, and a wide range of development supporting services such as improved agricultural extension, providing improved seeds, plants, breeding animals etc. and credit, supplying water, electricity, processing and marketing services, hospitals and schools.

This is important because to obtain a balanced social development the existing population in the Study Area must also be led into a modernisation and improvement process. The Native Customary Land, the bazaars, the small and maybe uneconomic sawmills and other industries must all receive some of the attention and funds for development. This widespread approach will influence the geographical distribution of activities which is the subject of the following sub section.

3.4.2 Geographical Distribution of Development

Development considerations will often have to meet a conflict between demands for efficiency and for equality. It may, in the short run, be more efficient to locate new activities - production, institution etc. - in already developed centres or areas, thus leaving the outsiders undersupplied with amenities and facilities. More equal conditions for people in all parts of the country call for a more wide spread development.

There is no general or final solution of this conflict, but it is today widely accepted both internationally and by the Malaysian Government, that development should be reasonably well distributed to all parts of the country and undesirable concentration in and congestion of one or a few cities avoided. At the same time urban development needs to be concentrated on a limited number of growth poles, to enable efficiency and good economy to expand.

In the "Preliminary Report on the Delineation of Sarawak into Viable Planning Regions" by The Planning Division Land and Survey Headquarters, 1971, the broad settlement pattern in Sarawak is outlined in four main "growth poles": Kuching, Sibul, Bintulu and Miri which are served by the Pan Sarawak trunk road as the main artery. Within this framework for regional development, the Study Area will rely on Miri and Bintulu as its main generators of economic growth. The former is already a growth pole, the latter could be made into one through a deliberate industrialisation policy.

In the development of Sarawak and the Study Area it is necessary to emphasize the importance of centres which can generate spread effects to an entire region and react positively to a development in their hinterland. Hence, in order to create growth in the Study Area it is important to canalise industrial activities into Miri and Bintulu, so that a modern industrial environments can be established within them. As far as possible the industrial and agricultural development should be located in a way that they can support each other. For instance, in order to make Bintulu grow faster than future industrialisation alone would account for, major agricultural developments should take place sufficiently close to the town that it would serve as a trade and service centre for the agricultural population, who in turn would support and enjoy its growing supply of services. This would create a positive interaction between the population engaged in primary and non-primary activities.

However, the areas of unencumbered State Land with possible agricultural potentials are located too far from both Bintulu and Miri to have any direct supporting effect on their development and vice versa. It is therefore considered necessary for the population connected with large scale agricultural development to have two or more separate centres for the supply of basic services. One centre would be in the Lambir-Subis area and another possibly where the Miri-Bintulu road crosses the Batang Suai.

To obtain population growth rates of even four or five per cent per annum, as is explained in Section 3.4.2, demands development of a considerable part of the suitable and unencumbered State Land which has been identified. Thus, during the twenty year period a large scale agricultural development of Blocks A4, A5 could be envisaged. (These development blocks are illustrated in Figure I.1 in Appendix I)

Nevertheless to fulfil the agricultural requirements created by a five percent increase in population it may be necessary to spread development to areas of shifting cultivation. Ideally this would lead to a relocation and concentration of the people presently engaged in shifting agriculture onto a smaller total area and practising a viable system of settled agriculture. Such development should be attempted as widespread as is possible in order to limit migration within the Study Area and provide a more geographically balanced population growth.

The effects of various types of development on the geographical distribution of employment creation and population growth and on the settlement pattern in the Study Area are discussed in chapter 5, Development Potentials of the Planning Units.

3.4.3 Development in Time

The phasing of development over the perspective plan period can be roughly demonstrated by the following figures in table 3.5, indicating the average annual increase in employment in the Study Area in four 5-year-periods.

TABLE 3.5 ANNUAL INCREASE IN EMPLOYMENT

Period	<u>Number of persons</u> (Growth rate 4%)	<u>Number of persons</u> (Growth rate 5%)
1971 - 75	1 600	2 200
1976 - 80	2 200	2 800
1981 - 85	2 400	3 400
1986 - 90	3 000	4 400

Note: The table is based on Table 3.4

A first idea of the significance of these figures can be obtained by a comparison with the Second Malaysia Plan according to which a total number of 600 000 to 700 000 new jobs should be created during the period 1971 - 75. If the Study Area is to play its part in this development proportionate to its population presently about one percent of total Malaysia, then new employment for between 6 000, and 7 000 persons would have to be created during the five years; which is a rate of between 1 200 and 1 400 per year.

It has already been explained in Section 3.4.2, why the development of the Study Area could be higher than the average of the country.

Another problem to consider is whether the growth rate should be constant over the 20 year planning period. It may be found desirable and possible to accelerate development, in the Study Area during the early years of the planning period, more than is indicated in table 3.5 in order to alleviate the problems resulting from land shortage in other parts of Sarawak or because at present there is an undesirable level of unemployment in the country. Alternatively development may be retarded due to the physical difficulties presented by the Area's isolated situation with no road connection to the rest of Sarawak and with only small scale facilities for seaborne outward connections. Retarded development could of course also be planned as a deliberate policy in favour of other areas in Sarawak.

CHAPTER 4

THE STUDY AREA AND ITS DELINEATION INTO PLANNING UNITS

The Study Area extends roughly 130 miles from north to south along a direct line from the Brunei border near Kuala Belait to Bintulu, and it extends 60 miles inland at its widest point, from Kuala Niah to Long Pila on the Batang Baram. The total area is, at around 3.5 million acres, about 37 percent of the total area of the Fourth Division. For planning purposes the Study Area has been divided into 3 planning units and 8 sub-units which are shown in Figure 4.1 and listed below.

Planning Unit I: Baram

- Sub-Units: - Marudi
- Long Lama
- Bakong

Planning Unit II: Bintulu

- Sub-Units: - Kemena
- Bintulu/Similajau

Planning Unit III: Miri

- Sub-Units: - Miri North
- Sibuti
- Niah/Suai

Except for Unit I, the boundaries of the planning units are the same as the existing administrative boundaries. Most often these boundaries follow the natural topographical boundaries; generally the water sheds. However, in some cases the original boundaries of the Study Area were contiguous with rivers; for instance where the Area's northern boundary met the Sungai Tutoh, the boundary followed this river to the Batang Baram and along the Batang Baram to Long Pila. Also the southern boundary followed the Sungai Pandan to the Batang Kemena and then along the river to the coast. In Sarawak rivers are not suitable boundaries for delineating planning areas because, being the main transport lines,

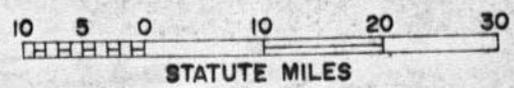
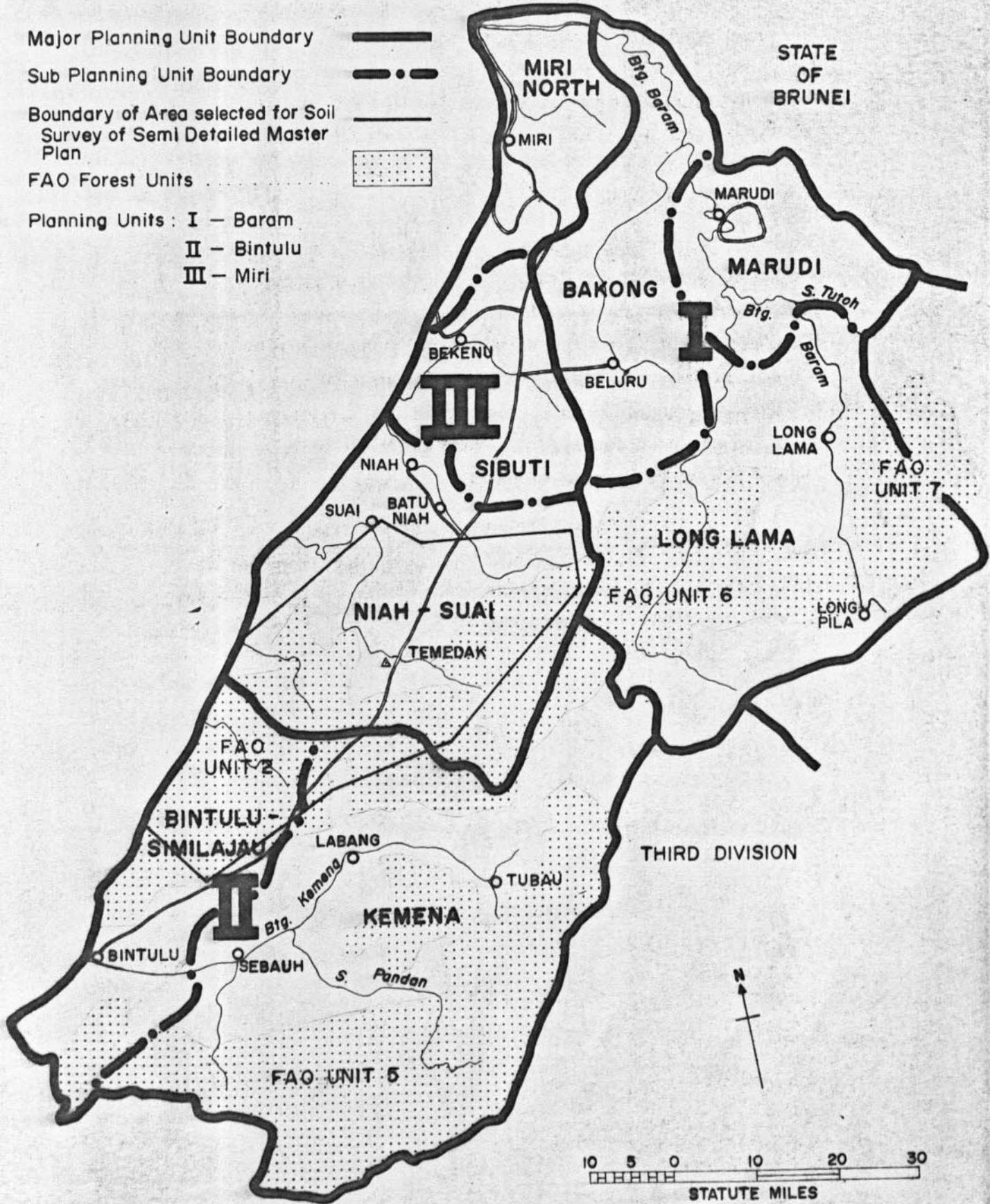
they are the arteries of social and economic activity. The rivers should be within units and not form the borders. For regional planning purposes it has, therefore, been necessary to extend beyond the original Study boundaries to include some of the areas east of the Batang Baram and south of the Kemena. The extension of the Baram planning unit partly covers the FAO Forest Unit 7. (The FAO Units, which are also shown in Figure 4.1 indicate the hill dipterocarp forest which have been identified by the FAO Forest Industries Development Team for exploitation).

To cover the natural economic and social catchment region of Bintulu, the Study Area should include the whole Kemena river system, which necessitates that the boundary of the Bintulu planning unit follows the administrative sub district boundary between Bintulu and Tatau and includes some of the FAO Study Unit 5. However, the land suitability of these extensions of the Study Area has not been assessed, neither are they included in the quoted 3.5 million acres of the Study Area.

A more detailed discussion of the delineation of the Study Area into planning sub-units is given in Appendix I, which also includes a map showing the development blocks with possible agricultural development potential.

PLANNING UNITS AND SUB-UNITS

- Major Planning Unit Boundary
- Sub Planning Unit Boundary
- Boundary of Area selected for Soil Survey of Semi Detailed Master Plan
- FAO Forest Units
- Planning Units : I - Baram
- II - Bintulu
- III - Miri



CHAPTER 5

DEVELOPMENT POTENTIALS OF THE PLANNING UNITS

5.1 Planning Unit I: Beram

5.1.1 Existing Situation, Natural Growth and Already Planned Development.

The main aspects of the unit are summarised in Table 5.1 and in Figure 5.1.

Table 5.1 BARAM PLANNING UNIT. Population and Agricultural Potentials

Year	Total Population	Labour Force	Land possibly suitable for Agriculture (acres)		Total acreage of the Planning Unit
			State Land	Encumbered Land	
1970	27 307	10 500	11 000	190 500	1 315 000
1990	47 000	18 000			

Population

Within the total 1970 population of about 27 000 the largest single community group were Ibans (13 500) with Other Indigenous and Chinese as the two second largest groups (5 to 6 000 each). The only urban settlement in the unit is Marudi with a population of about 3 900. The semi-urban settlement of Long Lama had a population in 1970 of 600.

Labour

More than 9 000 of the total labour force of 10 500 are engaged in primary industries (agriculture, forestry, fishing and mining). About 80 per cent of these are padi planters, i.e. low productivity employment.

Natural Growth

The natural growth (births less deaths) of the population is estimated at 20 000 during the period 1970 to 1990. The corresponding figure for the labour force is 7 500.

Agricultural Potential

In the Zonation Plan roughly 8 000 acres of State Land possibly suitable for agricultural development were identified in block A3 and 3 000 acres in C2. The acreages of Native Customary Land and Titled Land (encumbered land) possibly suitable for agriculture are 69 000 in block A3, 29 500 in block C1 and 92 000 in block C2.

Forestry

The FAO Unit 7, estimated to contain 180 mm cubic feet of valuable timber is located east of Long Lama. A proposal has been made by the FAO Forest Team that this resource should be held as a strategic reserve pending the possibility of establishing a timber industry either at Long Lama or Miri. For the FAO Unit 6, south-west of Long Lama the suggestion by the FAO Forest Team is that it should be opened for immediate exploitation for log export. West of Marudi there is a large peat swamp forest which could perhaps be used as the basis for a timber industry based on Marudi. The capacity of this forest has not yet been assessed within this Study.

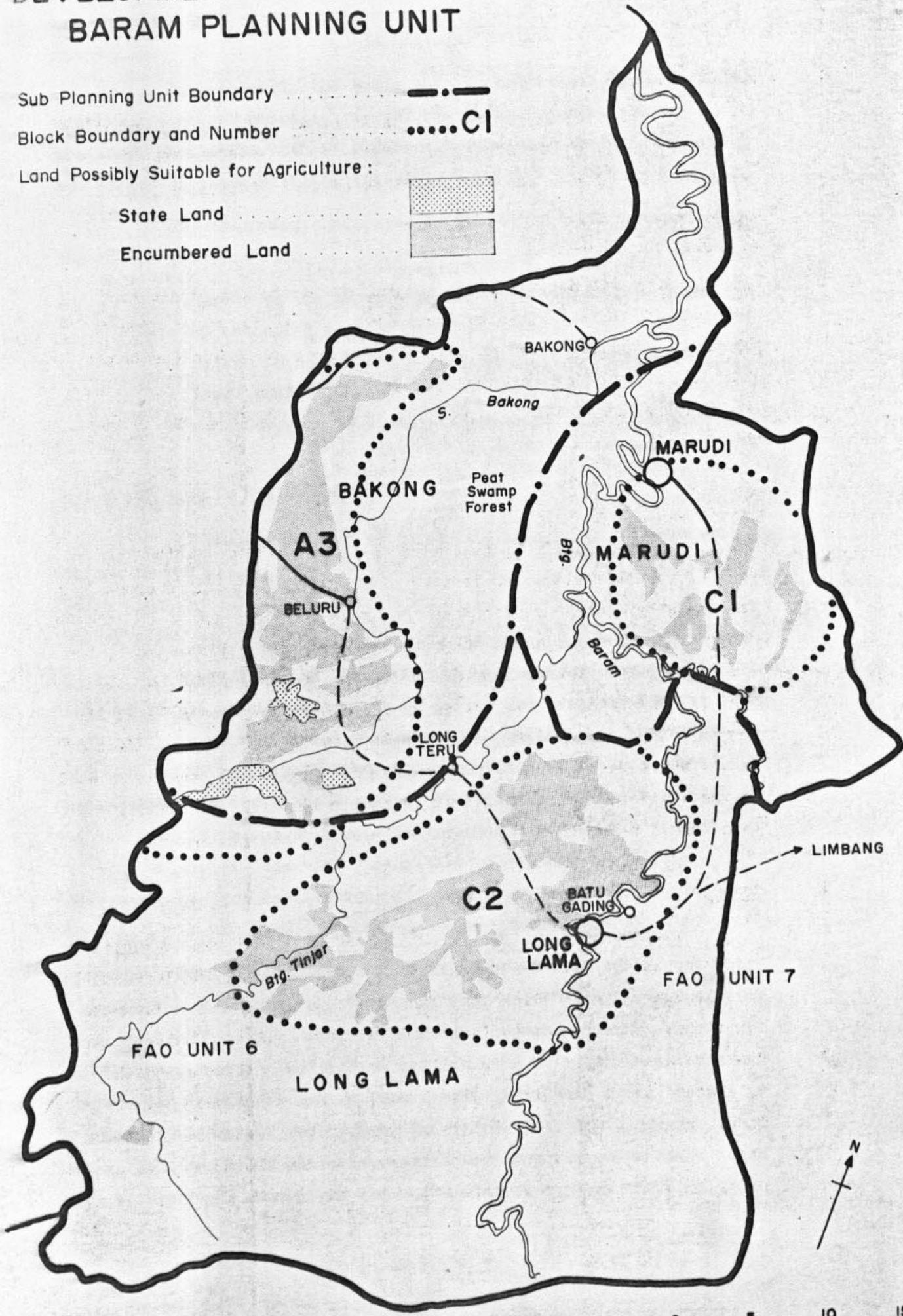
Cement

There is more than 21 mm tons of excellent cement-quality limestone in the Batu Gading area north of Long Lama. Shale suitable for blending with the limestone for cement manufacture overlies the limestone. Thus cement could be made at Batu Gading. However, at Kuala Baram a mud, with a low silica modulus is available and this is also suitable for mixing with limestone for making cement. Therefore the possibility exists of transporting limestone down the Baram river to Kuala Baram where it could be manufactured into cement using the gas, at present not used, from the west Lutong oil field.

DEVELOPMENT POTENTIALS OF THE BARAM PLANNING UNIT

FIGURE 5.1

- Sub Planning Unit Boundary — — — — —
- Block Boundary and Number CI
- Land Possibly Suitable for Agriculture :
 - State Land [stippled box]
 - Encumbered Land [solid grey box]



Transport

Traditionally the Baram and its tributaries have been the most important communication system of the area. Road and air transport facilities have only recently been organised in the area, and so far they are still on a limited scale.

The following roads are planned to be constructed during the Second Malaysia Plan

- Marudi to Ulu Linei (now under construction), with an extension to Long Lama;
- Beluru to Long Teru, with a possible extension to Long Lama;
- a feeder road from the Miri-Bintulu road to Bakong.

5.1.2 Development Potentials

If the development of the Study Area is to be concentrated in one or two places, then it is not likely that it would be in the Baram planning unit because there is so little State Land possibly suitable for agriculture, and most of the unit has no road access.

Thus, there can be no larger agricultural settlement schemes in the area, but schemes to assist the existing farming population in improving and changing their cultivation practices and also to introduce new crops and animal husbandry could be undertaken. In addition because of the relative inaccessibility of the area it is unlikely that in the near future a start will be made to exploit the timber potential of the FAO Unit 7. However an earlier exploitation of the peat swamp area west of Marudi, which could be an isolated project, could occur.

Thus by adopting a line of concentrated development for the Study Area in general, the Baram unit would experience a slow rate of development. Hence, on economic grounds, there would be little justification for a road between Long Lama and Long Teru or for the planned extension from Ulu Linei to Long Lama. With no large creation of employment opportunities in the planning unit, the area would probably experience a population drainage and the existing settlement and communication pattern would be

unchanged. Marudi would be the only urban centre of any importance and the rivers would remain the main means of communication. The strength of the population drainage would largely depend on what was happening in the rest of the Fourth Division, in Sarawak as a whole and in Brunei.

In order to avoid a large population drainage of the planning unit, development should be canalised to the planning sub-units with the greatest growth potential. These are possibly the sub-units of Bakong and Long Lama as the Marudi sub-unit will not be accessible by road for many years, and as there is a lack of natural resources which are immediately exploitable, except for the peat swamp forest.

Bakong-Long Lama Sub-Units

It is believed that future large scale agricultural development will be based on the accessibility of the area by road. Part of block A3 in the Bakong sub-unit already has road access. A future extension of this road from Beluru to Long Lama via Long Teru will open up land to the south-east in block A3 and in the northern part of block C2; the areas close to the road in these blocks could be used for agricultural development of a modern type. In the Native Customary Land along the road to Beluru oil palm planting, based on the facilities provided in the Lambir Subis Development Scheme, could possibly be undertaken by owner-cultivators on small holdings. In addition to the agricultural potentials in the area, there is the possibility of a more immediate exploitation of the FAO Unit 7 and the north-eastern part of FAO Unit 6.

An agricultural development on Native Customary Land in block A3 could be encouraged by a planned State-run scheme based on two areas of unencumbered land close to the programmed road between Beluru and Long Teru. These areas are big enough for the establishment of, for instance, nucleus estates, which could be the growth poles in the conversion of the surrounding shifting agriculture to a settled one.

In the northern part of block C2 there should be the possibility of establishing strips of agricultural development along the future road from which it should be possible to expand in future. The main crops for development in these areas would be those whose products need only simple processing to prepare them for market, are easily stored, are non-perishable, are of high value and are not bulky. However, the development of the Baram unit should not only be of an agricultural nature but should also include the exploitation of other natural resources, particularly the forests. The FAO Unit 7 is sufficiently large to support an advanced wood processing complex. Such a complex could possibly be established in the late 1970's and could also be fed by the north-eastern part of FAO Unit 6.

The potential for the utilisation of the peat swamp area west of Marudi has not yet been assessed during this Study. Hence it has not been taken into the following considerations.

The direct employment opportunities created by a wood processing complex near Long Lama, in logging, processing and generated indirect employment, could range from 2 600 to 2 800, of which about 1 800 to 2 400 would be inside the Long Lama sub-unit (estimates by FAO). Given a future population/employment ratio of 3:1 this would imply that some 5 400 to 7 200 people inside the sub unit would be affected by the complex. The employment creation outside the sub-unit of 400 to 800 (i.e. 2 600 to 2 800 less 1 800 to 2 400) with a dependant population ranging from 1 200 to 2 400 would, it is believed, take place in Miri.

A wood processing complex would form the basis for an urban settlement in Long Lama which would prevent, to some extent, a population drainage out of the sub-unit, such emigration could be expected if no development takes place because the natural growth of the population in the area is estimated at 8 000 up to 1990. Whether it will be possible to stop a future emigration will depend not only on the above mentioned range of employment creation, but also on the size of expansion in existing trade and industries, the opening of other new employment opportunities and on the number of presently unemployed and/or working in a low productivity activities, i.e. hill padi planting. The present

number of actively unemployed, i.e. people wanting and looking for work, in the sub-unit is roughly estimated at 500 to 1 000 people, and the number of workers in low productivity activities at 3 000.

To obtain a balanced geographical development of the Study Area the creation of employment possibilities, not dependent on agriculture in Long Lama would be desirable. However, the wisdom of planning for the whole of the timber processing complex to be in Long Lama is in doubt. To arrange for so large a part of an urban settlement to depend on only one kind of industry could be unwise, especially when this kind of industry may be rather vulnerable to changes in the world market prices. The possibility of splitting up the complex, with part of the pre-processing in Long Lama and the other part in, for instance, Miri should therefore be considered.

The existence of a wood processing industry and an urban centre in Long Lama would economically justify building a road from Beluru via Long Teru to Long Lama. This road would give a direct connection to the modern Miri-Bintulu area, and Long Lama would be the nodal point, where the road and river systems link. Such development would cut off some of the traditional trade relations between Marudi and the Upper Baram and Tinjar areas. Thus Long Teru and Long Lama would be in a favourable position as trade centres, with Long Lama as the possible future industrial, trade and administrative centre for the Baram planning unit. Such a development would seem likely to improve conditions also for part of Ulu Baram, maybe with the effect that the population from the more remote areas would prefer to move closer to the new centre.

During the latter part of the perspective plan period, Sarawak will probably need more than the 200 000 tons of cement a year that will be produced by the proposed factory in Kuching. At that time the Batu Gading Limestone, the cheap gas in Miri and the mud in Kuala Baram could be developed to establish a cement factory. If the factory were to be aimed at producing cement for export, i.e. to Sabah, Brunei or Vietnam, then an earlier establishment in the planning period could perhaps be possible.

5.2 Planning Unit II: Bintulu

5.2.1 Existing Situation, Natural Growth and Already Planned Development

Table 5.2 and Figure 5.2 summarise the main aspects

Table 5.2 Bintulu Planning Unit. Population and Agricultural Potentials

Year	Population	Labour Force	Land Possibly suitable for Agriculture (acres)		Total Acreage of the Planning Unit
			State Land	Encumbered Land	
1970	29 855	11 500	106 000	173 000	991 000
1990	52 000	20 000			

Population

The population in the Bintulu planning unit was about 30 000 in 1970. The major community groups are the Ibans (15 000), which are living mainly in the Kemena sub-unit. The Malays are the second largest group (7 500), most of them living in the Bintulu-Similajau sub-unit. The population of urban Bintulu was 6 200 in 1970 and of semi-urban Sebauh was almost 700 people.

Labour

Almost 9 000 of the labour force are in primary industries compared to 1 600 in non-primary occupations. In the primary group almost 80 per cent are occupied in low productivity activities.

Natural Growth

The natural growth in the population up to 1990 is estimated at 22 000 people, which corresponds to a growth in the labour force of 8 500.

Agricultural Potential

The prospects for agricultural development in this unit are much more promising than in the Baram unit. More than half of the State Land with possible agricultural potential in the unit lies in development blocks A5 and A6, which extend along the Miri-Bintulu road and in the Similajau Forest Reserve. Also, in the Kemena sub-unit, there are 14 000 acres of State Land possibly suitable for agriculture in development block B1, south-east of Labang, and small areas in the northern parts of B2 and A7. In addition there are large areas of Native Customary Land on which it may be possible to carry out agricultural improvement schemes.

Forestry

Some of the largest areas of accessible, unlogged hill dipterocarp forest in Sarawak are located within, or will be drained through, this planning unit. The forests are located in the FAO Unit 6 (Sawai and Niah-Jelalong Protected Forest) which is estimated to contain 330 mn cubic feet of valuable timber, the Unit 2 (Similajau-Labang Forest Reserve), with 470 mn cubic feet and the Unit 5 (Tubau-Belaga) with about 400 mn cubic feet. FAO tentative proposals are that Unit 2 should be the basis for Sarawak's first major wood processing industry, and that Unit 5 should be the basis for a timber complex in the Tubau-Labang area and Unit 6 should be logged initially for export, to maintain Sarawak's revenues from its forests until such time as the timber complexes are established.

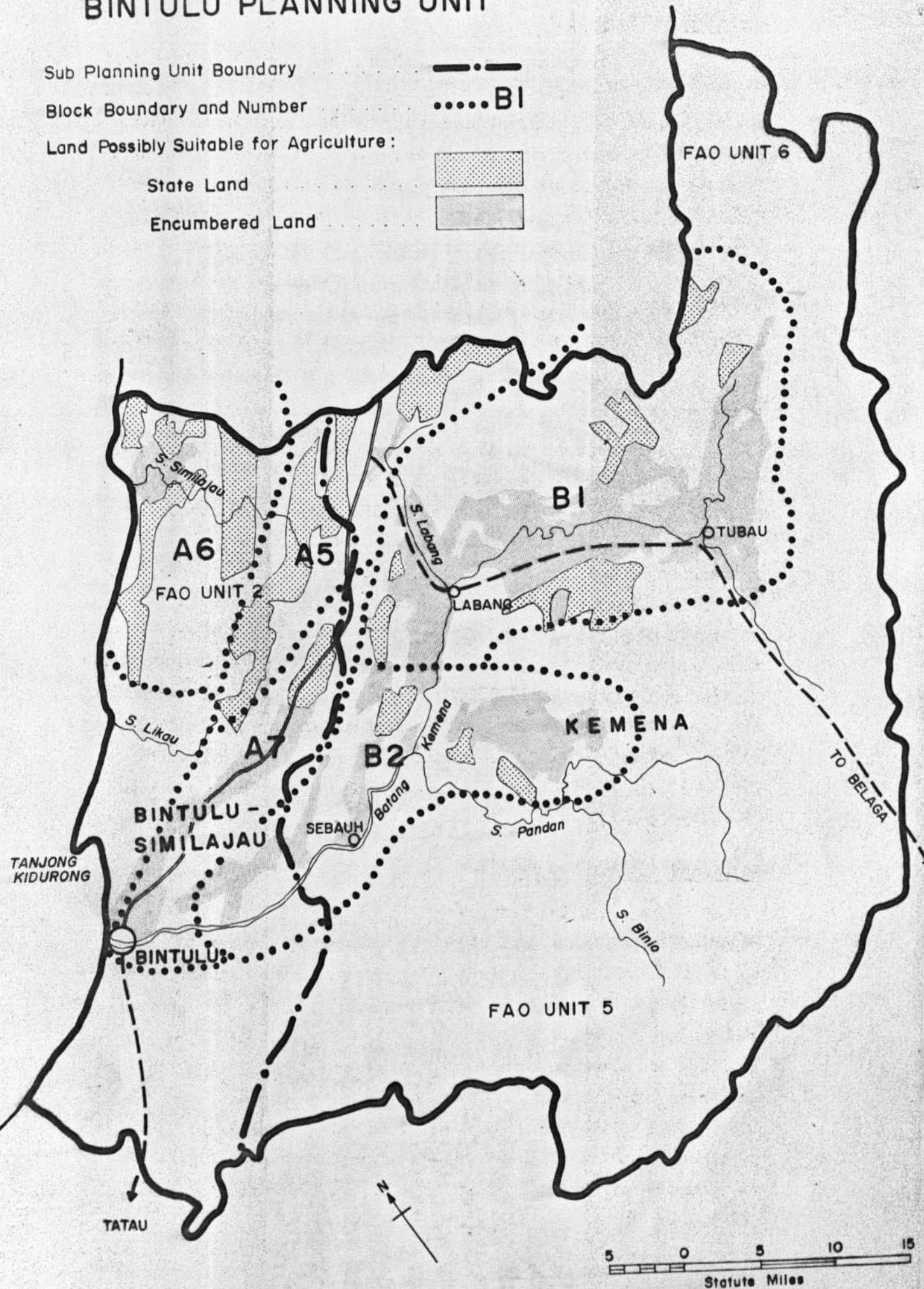
Liquified Natural Gas Plant

A liquified natural gas (LNG) plant is at the moment expected to be established at Tanjong Kidurong, roughly 10 miles north of Bintulu in the late 1970's. During the construction period (three to four years) of the plant the labour requirements will amount to a peak number of 4 000, of which about 1 500 would be recruited in Sarawak. When in operation the total number of employed will be about 300, of which 250 will be local staff and labour. The cost of the plant including pipelines from the off shore gas-field to the plant and from the plant to off shore loading buoys is roughly estimated at US\$ 500 mn.

DEVELOPMENT POTENTIALS OF THE BINTULU PLANNING UNIT

FIGURE 5.2

- Sub Planning Unit Boundary
- Block Boundary and Number BI
- Land Possibly Suitable for Agriculture:
- State Land
- Encumbered Land



The plant will need a large supply of fresh and clean water, roads and other infrastructure, the construction and provision of which will create considerable short term and some long term employment opportunities.

Glass Sand

White sand of a quality highly suitable for glass manufacture exists on old raised beaches along the coast south of Tanjong Kidurong and south west of Kuala Likau. This sand together with the gas available so close could possibly be used as the raw material in a glass processing industry.

Transport

Traditionally the main communication system of the unit is via the waterways, along the Batang Kemena and its tributaries and along the coast. This mode of transport is now being supplemented and partly substituted by air and especially road traffic on the Miri-Bintulu road.

During the Second Malaysia Plan the following roads in the planning unit are to be constructed

- a connecting road from the Miri-Bintulu road to Labang and Tubau;
- a trunk road from Bintulu to Tatau.

The existing airfield in Bintulu is located close to the residential areas, an unsatisfactory site giving little room for expansion. A new site for a future airport is presently being surveyed.

Tanjong Kidurong is mentioned as a possible site for a future deep sea port.

Bintulu

In the report titled "Preliminary Report on the Delineation of Sarawak into Viable Planning Regions" produced by the State Planning Unit, Bintulu town has been pointed out as a possible growth pole for parts of the Third and Fourth Divisions and as a centre for a new Division. The land in Bintulu is suitable for urban development, and at the moment the land development in the area has been frozen.

5.2.2 Development Potentials

The development possibilities in the Bintulu planning unit are much more promising and diversified than the ones in the Baram unit. There are the 106 000 acres of unencumbered land possibly suitable for agriculture, the vast forest resources, the glass sand, the Liquified Natural Gas plant at Tanjong Kidurong and a possible deep sea port or other relevant terminal for seaborne transport.

The Kemena Sub-Unit

The agricultural development possibilities of this sub-unit lie partly in improved cultivation of the Native Customary Land of approximately 135 000 acres and in the development of the 14 000 acres of unencumbered land in the block B1. This area lies between Labang and Tubau, and, after the connecting road to the Miri-Bintulu road has been constructed, this area and the eastern part of FAO Unit 2 together with the northern part of FAO Unit 5 will be easily accessible. To develop the 14 000 acres of State Land, to oil palm for example, would give a planted area of about 11 500 acres. Assuming 8 workers per 100 acres this area would create direct employment for 920 workers, which corresponds to a population of 2 800. The multiplier effect of this development on employment and population in derived industries and services could be about 650 workers corresponding to a population of about 1 950, thus giving a total population, directly and indirectly connected with the agricultural development, of 4 750.

The forest resources in the sub-unit are large enough to form the basis for a wood processing complex with a direct and indirect employment of 4 100 to 4 600, of which 2 500 to 3 600 could be inside the area. Most of the 1 000 to 1 600 job opportunities outside the sub-unit would probably be established in Bintulu.

Whether it is desirable to locate the whole of this complex within the area, or whether a part of it should be established in Bintulu, could be subject to the same kind of reasoning as for the Long Lama complex. The costs involved in the reasoning would be the difference between the total transport costs of transporting refined products to Bintulu if the whole complex were in the sub-unit, and the costs of transporting rough sawn timber to Bintulu if the complex were to be split.

The sum of the direct and indirect employment created by the agricultural development of the 14 000 acres and the wood processing complex would be roughly 1 000 or 5 000 with a dependent total population of 12 000 to 15 000. The natural growth of the present population in the sub-unit is estimated at about 11 000 up to 1990, giving a total future population of around 27 000. Thus, the creation of employment opportunities of this size can absorb from one thousand to four thousand people from the existing unemployment in the sub unit (500 to 1 000), the low productivity employment (6 000), or accommodate settlers from outside. Additional employment could perhaps in time be created, if the shifting cultivators could be converted to a settled agriculture on a proportion of the land presently used, and allowing immigrant people to settle on suitable parts of the abandoned land.

Under any development plan the agricultural population would most probably be dispersed in relatively small villages which would contain some basic services and it would be necessary to create a sub-regional services centre. The most suitable location for this would be together with the timber complex which, because of the future transport facilities would be along Tubau-Labang road. The size of this service centre would be in the range of present day Marudi, i.e. around 4 000 inhabitants.

The Bintulu-Similajau Sub-Unit

The obvious development potentials of this sub-unit are the forest resources, the possible future LNG plant and the possible deep sea port or some other form of sea transport terminal. Additionally there seems to be political preference for appointing Bintulu a growth pole. The present size and attributes of Bintulu town are hardly in themselves of a quality that would attract large scale development.

Most of the State Land possibly suitable for agriculture lies too far from Bintulu to have a major impact on the growth of Bintulu town itself. It is more likely that development of these areas would be in connection with other nearby areas further north and would thus be the hinterland for a local centre in the Niah-Suai sub-unit.

The exploitation of the forest resources in the FAO Units 2 and 6 could support two wood processing complexes, one of which could be located in the above mentioned centre, and the other in Bintulu. The timber complex in Bintulu would directly and indirectly cater for a total population of 13 000 to 14 000. In addition to this would come the induced employment creation in Bintulu from the establishment of wood complexes in Labang and in Niah-Suai. The size of this induced employment would be in the range of 2 000 to 3 200 job opportunities corresponding to a population of 6 000 to 10 000.

A future LNG plant at Tanjung Kidurong would be a rather specialised installation and could not be combined directly with any other industrial development, nor would it contribute, to any extent, to the construction of a deep sea port. However, the gas coming to the plant could provide cheap energy in the area, and could be utilised for local industrial processing. In this sense the plant could give impetus to industrial growth.

Nevertheless the gas would probably be sold at a higher price than that available in Miri, because the alternative market for the gas in the Bintulu area would be as liquified gas to Japan. The Miri gas is at present **not utilised**. Besides, the possibility of using the Tanjong Kidurong gas for glass manufacture and in the wood complexes in Bintulu, there is the possibility of creating a nitrogen **fertiliser** industry. Neither the significance nor size of any those uses have yet been fully considered.

The labour force required during the construction period of the LNG plant would be about 1 500 local workers and contractors together with about 2 500 expatriates. All these would have a multiplier effect on the service employment in the area, as they will require housing for themselves and their families and some of their supplies will be obtained from the local traders. Most of the housing, however, will probably not be of permanent character. The size of this ~~short-term~~ multiplier effect on the local economy in Bintulu could be in the range of 5 000 to 7 000 indirect employment opportunities.

After the construction period the LNG plant employment would drop to around 300, of which 250 would be local staff. This implies a proportionate drop in the indirect employment, which could have an unfortunate effect on the local service sector because the latter might easily have increased its capacity too much during the construction period. Thus, the timing of the construction of an LNG plant and the build up of wood processing industries should be carefully planned and implemented in order to avoid or **minimise** such drops in employment. Thus the impact on the creation of local employment opportunities of the huge investment in a LNG plant would be relatively little, though it might be the first step in an industrialization process.

If Bintulu is chosen as a future centre of a new division, this would lead to increased employment in public services in the town and would have multiplier effects on the service population. The difference in public employment between the present day Miri and Bintulu is about 500. Assuming a general increase in public employment in Sarawak, the number of government employees in a future centre at Bintulu could be the size of the present day Miri. The impact of this increase in public employment would be an indirect employment of another 500 persons and a total population increase, both direct and indirect, of 3 000.

In total the envisaged employment connected with wood processing, the LNG plant and the public employment could easily support an increase in the urban Bintulu-Kidurong population of about 20 000 before 1985.

The rural population in the sub-unit would consist of the people engaged in horticulture around Bintulu and those of possible new agricultural schemes in the southern parts of blocks A5 and A6. The size of such schemes could be of 30 000 to 40 000 acres with a minimum population directly and indirectly connected with the schemes of 10 000 to 14 000. However, because the location of State Land possibly suitable for agriculture is too far north for its development to have any direct influence on the growth of Bintulu the possibilities of developing encumbered land in block A7 and in the western part of block B2 should be considered. Nevertheless the timber and the possible agricultural development within the Bintulu planning unit and its present catchment region will hardly alone justify a deep sea port in Tanjong Kidurong even in conjunction with the LNG plant which will provide its own transport installations.

Thus to make such a port viable other industries or activities must be established within, or in the hinterland, of Bintulu. How far the hinterland of such a port would extend has yet to be considered. Furthermore, no survey has been undertaken around Tanjong Kidurong to establish whether a port could be located there or the probable cost of it. In this connection it seems essential to consider the entire port and sea transport system of Sarawak to find the type and location of future ports.

The considerations must include type and quantity of goods exported from and imported into the country, and the alternative of the possibility of establishing a feeder service to a common deep sea port in Borneo, Singapore or Johore Bahru.

The urban development of Bintulu offers some intricate and specific problems. The range of possible future developments of the town is quite wide, because some of the important single elements in the development pattern are still very uncertain:

- the establishment of an LNG plant has not yet been finally decided,
- the possible number and size of derived industries is not easily established,
- the question: if or when a deep sea port should be built, is open,
- this also leaves open the question of the optimal location of timber plants, i.e. whether they shall be located near Kemena and Bintulu or in the Tanjong Kidurong area.

A port, LNG and timber plant development in the Tanjong Kidurong area would necessitate considerable investments in urban facilities in this area, including roads, telecommunications, hospitals, residential housing etc. At the same time old Bintulu must maintain and expand its function as a trade and service centre for its hinterland and probably provide land for various manufacturing industries.

The problem will be how to unite the development of these two urban areas, with a distance between them of about 10 miles, so that the future town will emerge as one important centre and growth pole. To ensure this will call for careful town planning and especially for administrative powers to guide and direct this development. The town planning will meet two challenges, one from the uncertainty of scale of development, and the other from the fact that development will be taking place in two areas with considerable distance between them.

5.3 Planning Unit III: Miri

5.3.1 Existing Situation, Natural Growth and Already Planned Development

The development potentials of the planning unit and its sub units are indicated in Figure 5.3 and important aspects are summarised in Table 5.3.

Table 5.3 Miri Planning Unit. Population and Agricultural Potentials

Year	Population	Labour Force	Land possibly suitable for Agriculture (acres)		Total Acreage of the Planning Unit
			State Land	Encumbered Land	
1970	59 277	32 000	244 000	138 000	1 246 500
1990	103 000	55 000			

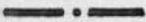
Population

In 1970 the population in Miri district was 59 000. The largest single ethnic group as the Chinese (23 000) with Malay and Ibans as the two second largest groups (about 13 000 each). The urban area of Miri-Iutong had at the census time a population of about 27 000.

Labour

The labour force in the unit is distributed equally between primary and non-primary industries, which is quite different from the distribution in the other units. About 6 600 persons are occupied in low productivity activities. The natural population growth up to 1990 is estimated at 44 000 with a corresponding increase in the labour force of 23 000.

DEVELOPMENT POTENTIALS OF THE MIRI PLANNING UNIT

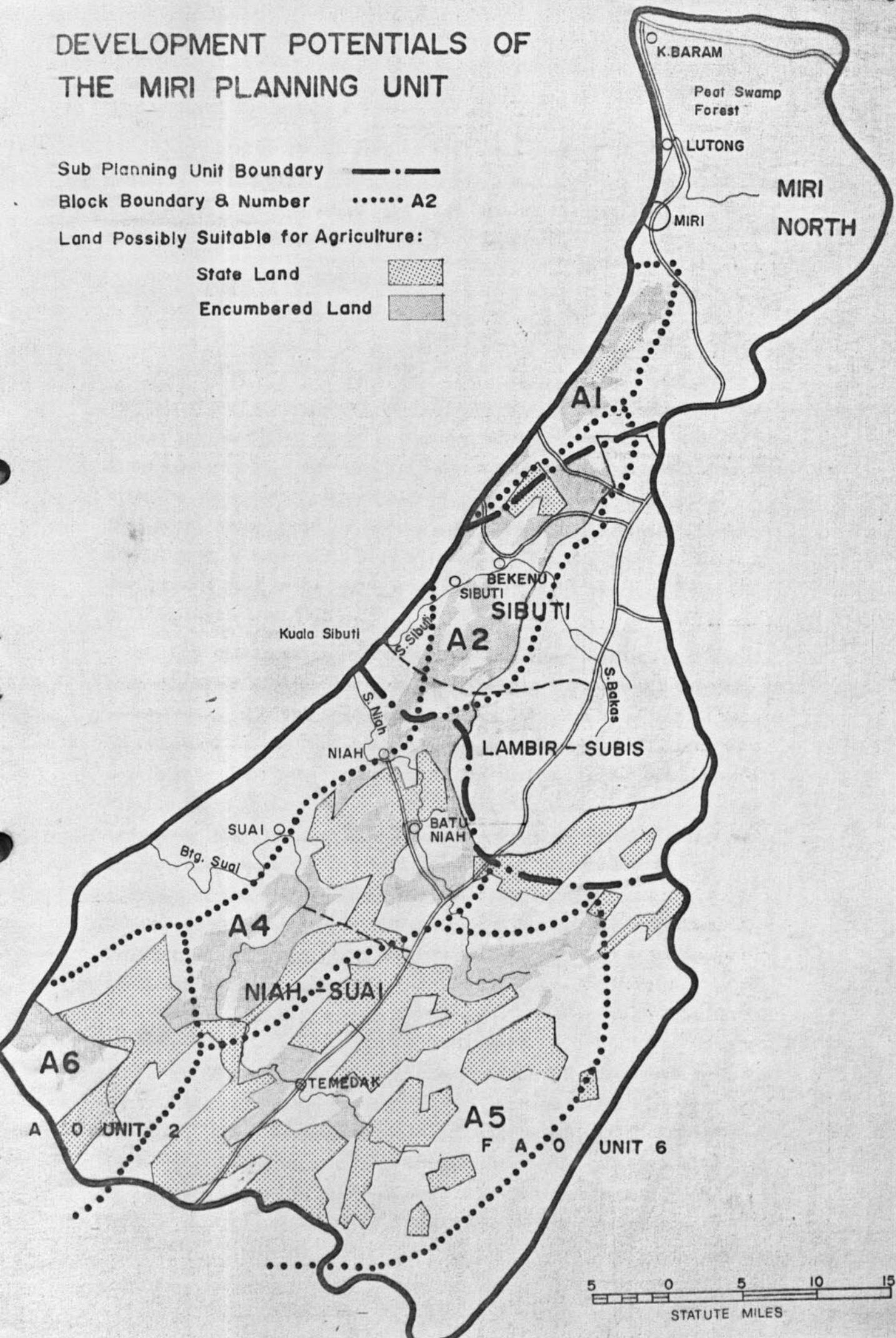
Sub Planning Unit Boundary 

Block Boundary & Number  A2

Land Possibly Suitable for Agriculture:

State Land 

Encumbered Land 



Agricultural Potentials

Almost 70 per cent of the total acreage of State Land with possible agricultural potential in the Study Area has been identified in the Miri planning unit. The distribution of this land in the development blocks is as follows (see figure 5.3):

- A1 : 5 500 acres
- A2 : 12 000 acres (some areas in Lambir-Subis are included)
- A4, A5 and A6: 226 500 acres

The main agricultural development in the planning unit during the next five years is already taking place within the Lambir-Subis area. The already planned development directly connected with the Commonwealth Development Corporation (CDC) and Sarawak Land Development Board (SLDB) oil palm schemes will produce about 60 000 tons of palm oil per year, when in full production. This development will cater for a total population of about 23 000, who will be settled by 1975 - 76.

The location of the proposed oil palm factory has not been finalised nor has the method of loading the palm oil into the sea-going ships. The SLDB factory is expected to be either at mile 37 from Miri on the Miri-Bintulu road or at Kuala Sibuti. The two most likely locations for the palm oil bulking installation are Miri or Kuala Sibuti and the oil will either be pumped to the ships through a long pipeline or taken to the ships in specially designed barges. Important factors to be considered with regard to the location of the factory are transport costs of the fresh fruit bunches to the factory and the oil to the bulking installation, supply of fresh water, disposal of effluent and the impact on settlements in the area.

Forestry

The northern part of the FAO Unit 2 and the western part of the FAO Unit 6 (Niah-Jelalong) lie within the Niah-Suai sub unit. Other workable forests of varying quality in the planning unit are the peat swamp forest north east of Miri and some hill dipterocarp forest in the Niah-Suai and the Sibuti sub-units. Much of the hill dipterocarp forests have already been logged

though there is some valuable timber still remaining, for instance the Bakas forest contains about 2 tons of valuable logs per acre. The possible value of the peat forest has not yet been assessed within this Study.

Transport

The transport system of the planning unit is, compared to the other units, quite well developed, especially the roads. Externally the unit is connected by road, water and air, the latter being important for passenger traffic to and from Miri; most goods traffic is by sea carried in relatively small coasters. Recent improvements for the sea going traffic are the new 800 gross registered tons coastal vessels going directly between Miri wharf and Singapore with a loading capacity of around 500 tons of cargo.

During the Second Malaysia Plan feeder roads will have a high priority. Possible locations of feeder roads in the unit are

- from the mile 37 on the Miri-Bintulu road to Kuala Sibuti;
- from the northern part of A5 on the Miri-Bintulu road and into the southern part of A4.

The road to Kuala Sibuti will, however, depend on the location of the SLDB oil palm factory and the evacuation of palm oil. The cost of this road is roughly estimated by the FWD at M\$2 to 3 mn depending on whether it will be surfaced or not. If the bulking installation is located at Miri surfacing of the Miri-Bintulu road as far as the factory will probably be necessary and economically feasible.

An extension of the Miri airport has been planned, so that Boeing 737 and corresponding aircraft types will be able to use it.

Miri-Lutong Urban Area

The existence of this built-up area with about 27 000 persons in 1970 will be an important factor in the development of the planning unit and the Study Area. The population has increased during the period 1960 to 1970 by 5.2 per cent per year. Today this area represents a considerable concentration of industry, transport, public and private services which will, most likely, continue to grow rapidly in the future.

A town plan for the area north of the city centre has been prepared by the Department of Land and Survey. According to this plan the old Malay houses along the Miri river will be cleared and a new Malay Kampong will be built.

5.3.2 Development Potentials

The development potentials of this planning unit lie in the creation of basic industrial employment connected with oil, gas and timber in the Miri North sub-unit, the agricultural development of the Lambir-Subis in the Sibuti sub-unit, and the potentials for agricultural and forest development in the Niah-Suai sub-unit. The priorities for development of the various areas will be influenced by Miri as a centre offering private and public services of considerable quality. The town is already a growth pole and a magnet for further development. Any additional population resulting from any development with good access to this town will not only enjoy its services, but will also contribute to a further increase and refinement of the service level of the town. Therefore, it appears that Miri will be the leading service centre of the Study Area for a considerable time regardless of any opposing effects of other development requiring new towns or the strengthening of existing ones.

Miri-North Sub-Unit

The oil and gas potentials around Miri will give rise to new employment either in connection with the expansion of existing activities off-shore or with derived industries using the cheap gas in the area.

A wood processing complex, or part of one, (as was explained in Section 5.1) based on the exploitation of the FAO Unit 7, could be located in Miri. Other sources of logs could be from the Niah-Jelalong Unit and the peat swamp area north-east of Miri.

The growing urban population in Miri could be the basis for market gardening along the Miri-Bintulu road and along the coast south of Miri.

If the population growth of the Miri-North sub-unit continues at roughly the same rate as in the last 10 years, the population will rise from about the present 37 000 to about 100 000 in 1990. This will imply a net in-migration of 35 000. The urban population of the sub-unit could then amount to some 60 to 70 000. Most of the future population growth will be in the urban area of Miri-Lutong and in the horticulture and livestock producing population to support these people, therefore in the future there could be conflicts in the demand for land for urban development and for market gardening. A careful long range and short range town planning of Miri must be provided to assure its amenities and good functioning as a modern urban centre.

Sibuti Sub-Unit

Certain increases in the basic employment outside the urban Miri will take place within the Lambir-Subis Area. The agricultural population connected to the CDC and SLDB schemes will mostly be wage-earners, which implies that their way of living and their demand for goods will be different from the traditional agricultural population. Their incomes will be mostly in cash and not in kind, and, similar to an urban population, they will buy goods and services from other people.

The preliminary proposal for settlements in the Lambir-Subis Area is to locate the population in about 8 to 10 villages of about 3 000 persons each and one larger urban centre. Each village would have facilities to supply day to day needs.

The development of the CDC and SLDB schemes with a future population of from 25 to 30 thousand people will require a local service centre of about the same size as today's Bintulu, i.e. around 4 000 inhabitants. The supply of service could not easily be achieved by expanding the existing service centres of Bokenu or Batu Niah because they are too far away. Hence, the best solution would seem to be the creation of a new centre along the Miri-Bintulu road, somewhere near where the road from Beluru meets it.

Niah-Suai Sub-Unit

This sub-unit contains in block A5 probably the most promising land for agricultural development in the whole Study Area. If 30 to 40 000 gross acres of agricultural development could take place here the area might cater for about five to seven thousand people with a livelihood in agriculture. An additional population of the same size would be required to fulfill the employment opportunities derived from the primary and secondary processing industries as well as the demand for services of the total population. This would give a total new population in the area of about 10 to 14 thousand by 1980/85. Such a population would require a service centre of nearly the size of the present day Bintulu, in addition to a few scattered local centres. The main service centre besides requiring a central location in relation to the distribution of the population, would also need a reliable supply of fresh water, power, suitable building ground, etc. A possible site for such a future centre is where the Miri-Bintulu road crosses the Batang Suai. This location is within 10 miles of most of the State Land possibly suitable for agricultural development in block A5 and is a suitable junction for a road to the large areas of possible agricultural development within Similajau Forest Reserve. The orientation of the population in this area for a service centre of higher order will probably be towards Bintulu.

The Niah-Jelalong forest would, if used exclusively for log export, be drained by the Niah river. If used for wood processing industries, it could either be the basis for one complex in connection with the above mentioned agricultural centre in A5 or be a support to the supply of complexes in Bintulu and Miri. The total direct and indirect employment creation would be, for the whole planning unit, a maximum of 2 500 to 3 600, which corresponds to a population of 7 500 to 11 000.

By and large, the Miri planning unit is envisaged as a rapidly growing unit based on industrial and service development in the Miri sub-unit and modern agricultural development along the Miri-Bintulu road. Whether the Niah-Suai sub-unit will also experience in-migration and high population growth will depend on whether the Niah-Jelalong forest is used as a basis for a wood processing complex in the sub-unit and on how much of the planned agricultural development will be located in this sub-unit. The latter will in turn depend on whether the strategy will be to concentrate or to disperse agricultural development.

On the basis of these development possibilities the population in the planning unit could rise to between 140 and 160 thousand by 1990, which would require an in-migration of about 40 to 60 thousand people. The settlement pattern associated with such a population would be a large urban centre, Miri, and possibly two sub-regional centres along the Miri-Bintulu road, which will be the central feature in a herring bone pattern road system.

Appendix I

DELINEATION OF THE STUDY AREA INTO PLANNING SUB-UNITS

1. General

The division of main planning units into sub-units has been based on;

- (a) the delineation of blocks with possible agricultural development potential which were identified in the Zonation Plan; (See Figure I.1.)
- (b) the boundaries of the 1970 Census Circles and administrative sub districts;
- (c) existing and possible future communication systems and settlements.

The delineation of the development blocks was based on physical criteria and on accessibility. Thus the blocks can be viewed as sub-regional agricultural development units. The most accessible blocks along the coast and along the Miri-Bintulu road are now numbered from A1 to A7. The C and B blocks in the Baram and Bintulu planning units are the more remote blocks, except for the north-western part of block B1 which is close to the Miri-Bintulu road. The numbering of the blocks in this Figure does not follow those used in the Zonation Plan as it has been found necessary to make some changes.

2. Baram Planning Unit (Unit I in Figure 4.1)

This unit has been divided into three sub-units:

- Marudi
- Long Lama
- Bakong

The reasons for the delineation of the Baram-Tinjar area into two sub-units - Marudi and Long Lama - are:

- (a) findings of the Zonation Plan, where two separate development blocks have been identified C1 and C2;
- (b) possible future orientation of the economic and social activity in these blocks. C1 towards Marudi, and C2 towards Beluru and Miri.

The orientation of Marudi will probably remain as today, namely along the Batang Baram; the Long Lama sub-unit, however, may in the future, be connected by road to the Miri-Bintulu road system. This will give a westward orientation towards Long Teru, Beluru and Miri. The boundaries of both sub-units follow Census Circle boundaries, except for the southern part of the Long Lama unit which is an arbitrary line south of Long Pila.

The Bakong sub-unit, which lies within the Baram administrative district, will be more orientated towards Miri than towards the Baram planning unit because of a planned future road connection to Miri. Only the north-eastern part of the sub-unit, running along the Batang Baram, will possibly continue to have a stronger interaction with Marudi than with Miri. The sub unit is comprised of the whole of the Census Circles O1 and O2; it also includes the development block A3.

3. Bintulu Planning Unit (Unit II in Figure 4.1)

The unit is divided into two sub-units:

- Kemena
- Bintulu/Similajau

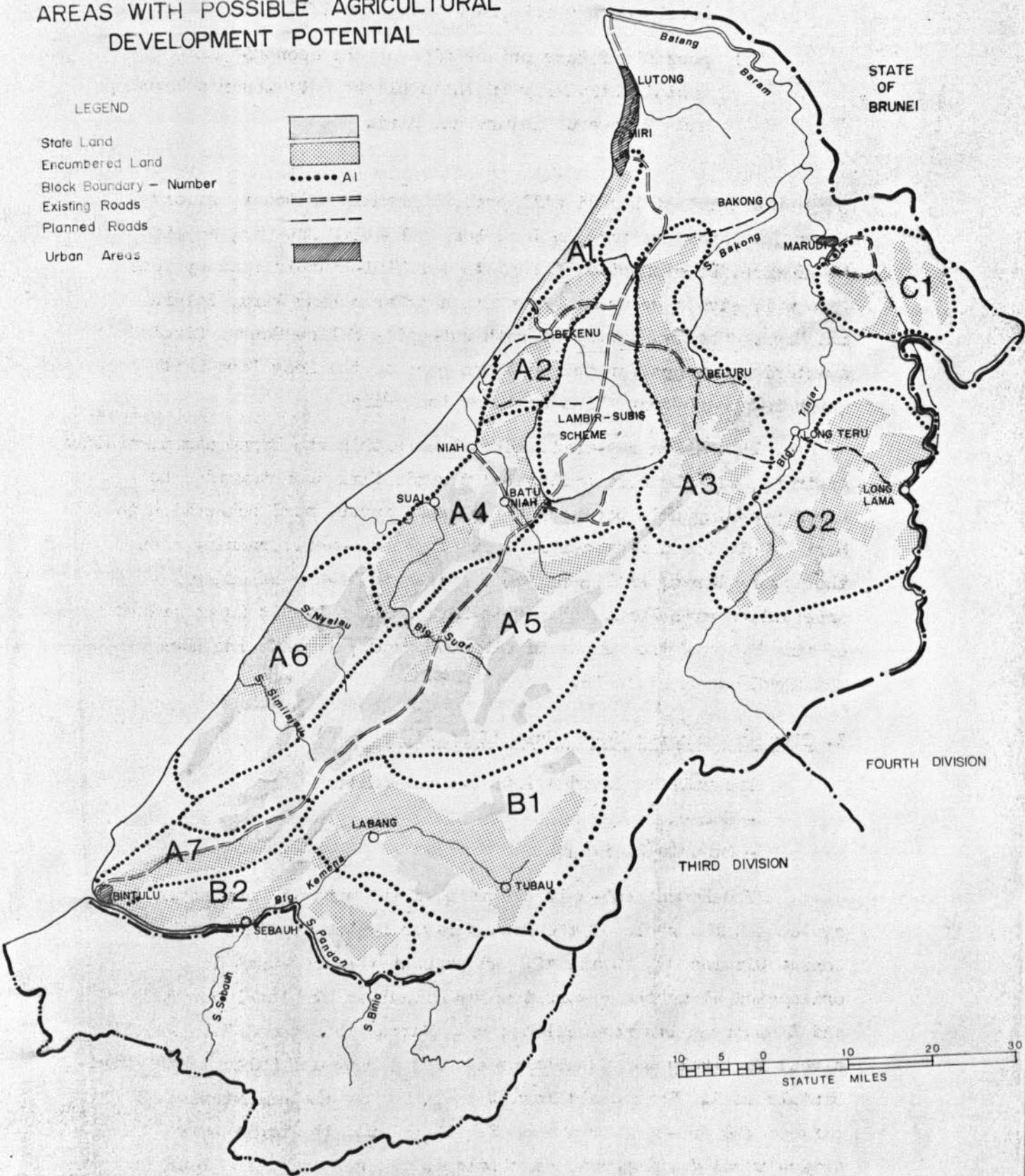
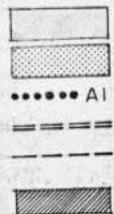
The Kemena sub-unit consists of the upper Kemena river system and the whole of the Pandan river system together with the Census Circles 09, 10 and 12. At present this sub-unit is orientated along the rivers towards Sebauh as its local centre and Bintulu as its regional centre. During the Second Malaysia Plan a road is likely to be built connecting Labang and Tubau to the Miri-Bintulu road. This could lead to a change in the orientation of part of the sub-unit away from Sebauh. Thus, the areas with agricultural development potentials in the sub-unit have been separated into two blocks, B1, and B2. Included in the sub-unit are parts of the FAO Study Units 2, 5 and 6.

FIGURE I-1

AREAS WITH POSSIBLE AGRICULTURAL DEVELOPMENT POTENTIAL

LEGEND

- State Land
- Encumbered Land
- Block Boundary - Number
- Existing Roads
- Planned Roads
- Urban Areas



The borders of the Bintulu/Similajau sub-unit follow those of the Bintulu administrative sub district and cover the Census Circles 01, 02 and 03. This sub-unit is the nearby hinterland of the Bintulu service centre which is fed by the main communication arteries of the Kemena river, the coastal line and the Miri-Bintulu road. **Natural** resources in the sub unit are: the development block A7, the southern parts of blocks A5 and A6, a large part of the FAO Study Unit 2 and a small part of FAO Unit 5.

The economic and social catchment region of Bintulu really includes the whole of the Kemena and Pandan river systems as well as the Tatau river system. The latter river system, which is not included in this Study, depends on Tatau and Kuala Tatau for the supply of local services but upon Bintulu as a regional private and public service centre. The future influence of Bintulu as a regional service centre will, to some extent, depend on whether the construction of the Pan-Sarawak main road starts from Bintulu or from Sibiu. Important physical resources in these southern areas are the forests, especially the FAO Unit 5 which, it is believed, contains large areas of land with possible agricultural development potential. The Tatau river system contains the Census Circles 04, 05, 06, 07 and 08.

4. Miri Planning Unit (Unit III in Figure 4.1)

The unit has been divided into three sub-units:

- Miri North
- Sibuti
- Niah/Suai

The administrative sub district of Miri and the Miri North planning sub-unit are the same. The area covers the Census Circles 01 to 05 and contains development block A1, also the Miri/Lutong urban areas and its nearby hinterland. The southern part of the sub-unit, however, receives its local services from the Bekenu semi-urban centre, which is in the Sibuti sub-unit.

The Sibuti sub-unit covers the Lambir-Subis Development Area and development block A2. The Census Circles included in it are 06, 07, 08 and a part of 10. Within Census Circle 10 the boundary of the sub-unit follows the block boundary between blocks A2 and A4, as this seems to be a more natural, physical, social and economic boundary than that of the Census Circle 10.

The delineation of the boundary between the Sibuti and the Niah-Suai sub-units has been difficult because the development and the settlements along the Miri-Bintulu road are in continuous growth southwards. The Niah/Batu Niah settlements, which have been included in the Niah/Suai sub-unit, could have been included in the Sibuti sub-unit, but the growing population in the Sibuti sub-unit will probably not depend on Niah/Batu Niah for their supply of services but rather on a centre in the Lambir Subis Area, whereas future development in block A4 will probably depend for services on Niah/Batu Niah.

The Niah/Suai sub-unit consists of the Census Circles 09, 11, 12 and the remaining part of 10. The unit includes the development block A4, and parts of blocks A5 and A6. Blocks A5 and A6 are the proposed areas for commencing the soil survey work for the Semi-Detailed Master Plan Area. In this sub-unit valuable forests are found in the FAO Units 2 and 6.

APPENDIX II

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With Comments
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MIRI - BINTULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER
DEVELOPMENT
STRATEGIES

An Interim Report for
Discussion with the
Steering Committee

— DECEMBER 1972 —

HUNTING TECHNICAL SERVICES LTD.,
LONDON

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COPENHAGEN

MIRI-BINTULU REGIONAL PLANNING STUDY

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By C. J. MATHIESEN

S. JORGENSEN

DECEMBER 1972

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1. SUMMARY AND CONCLUSIONS

1.1 Purpose of the Report

This interim report is a revised and continued edition of an earlier working paper which was used, together with other papers, as a basis for the briefing of the State Action Committee in Kuching and members of the EPU staff in Kuala Lumpur. The report contains ideas and considerations resulting from these discussions and from deliberations in Steering Committee and Task Force meetings. The purpose of this report is to present a basis for a discussion between the Government, (represented by the Steering Committee,) and the Consultants of certain main aspects of development in the Study Area during the period 1971 to 1990.

The aspects are:

- (a) how large should the 1990 population of the Study Area be; or vice versa how extensive should the development efforts be;
- (b) how should the production and occupation structure develop;
- (c) where in the Study Area should the development be undertaken and the population be settled;
- (d) which measures and actions can be applied to lead the development in the desired direction.

It has not been the purpose of this report to deal with all relevant subjects of these aspects, but it has been found appropriate, at this stage, to initiate a discussion on development strategies based on information now available.

1.2 Basis of the Report

The considerations and calculations are based on data obtained by the Consultants through travelling throughout the area, from interviews and conversations with Government officials and other influential persons, from previous reports and official statistics. Some of the calculation results are obtained by applying certain planning keys, such as the relation between total population and labour supply, and between basic and derived employment. These planning keys are described in special working papers which are mentioned in the reference list. Some of these papers will be subject to further considerations following the expected discussion on this report.

1.3 Conclusions

No attempt has been made to come to very specific or firm conclusions; the primary purpose of the report has been to raise relevant questions for discussion. In accordance with the directions of the Terms of Reference agricultural development has been given high priority and the starting point for the considerations has been the potentials which were tentatively identified in the Zonation Plan. A full utilisation by 1990 of all the 860 000 acres of land assessed as possibly suitable for agriculture within the Study Area would alone lead to a population growth, in the Area, of seven percent annually, which would result in a fourfold increase in population by 1990. This would imply that more than half the total population increase of Sarawak during the period 1971 to 1990 would be accommodated in the Study Area. Unless a major in-migration from West Malaysia could be considered an appropriate issue, this development rate seems to be unrealistic. Therefore two other situations have been considered which would result in lower population growth rates, namely four percent and five percent annually.

For both of these growth rates an occupation structure has been worked out. These structures are not forecasts of expected events but are illustrations of two situations among many which could occur. The purpose of presenting them is to give a basis for discussions on such questions as: are these situations desirable?; are they realistic?

The 1970 population of the Study Area was roughly 12 per cent of the total in Sarawak. The theoretical situations presented would result in the Study Area's percentage of the total population rising by 1990 to 15 percent and 18 percent respectively. In both the situations employment within all the main sectors of production; agriculture, forestry, manufacturing and services (private and public) is expected to grow. However, agriculture and services are expected to decline relatively during the 20 year period while forestry and manufacturing are growing. This trend is shown in Table 1.1.

TABLE 1.1

Occupation by Main Groups

	Percentage of Total Occupied Persons		
	1970	1990	1990
		(at 4% growth rate)	(at 5% growth rate)
Agriculture	53	48	49
Forestry	9	13	13
Manufacturing	14	20	19
Services	24	19	19
Total	100	100	100

The basis for these hypotheses are the ideas that agriculture would be modernised not only by planned development of new land, but also by improvement schemes in the existing Native Customary Lands; that forestry would be developed as a basis for a new and strongly expanding timber and wood processing industry; that manufacturing would be developed not only for processing local products, but also for supplying the growing population and enterprises with various goods. The manufacturing could perhaps also extend to industries of a more general character, such as components for sophisticated machinery and equipment.

The industrialisation would need to be based on a deliberate Government policy and positive measures would be needed with respect to attracting industries by investments in infrastructure such as roads, power supply, building sites, housing, hospitals and by training of an adequate labour force. A particular problem facing development in the region is its transport connection with the world outside. Because this problem is closely connected with transport development throughout Sarawak, it is appropriate for the regional problems to be considered as part of an overall development of sea ports, airports and trunk roads.

The distribution of population is influenced by a number of factors; for example, nature largely decides the location of those who rely for a living on agriculture, forestry, mining and oil extraction. But so long as these resources are not fully utilized, priority in developing them further can be given to selected areas thereby controlling, to some degree, the distribution of growth. The same holds true with respect to location of urban areas and urban productions.

In so far as deliberate influencing of location is possible there are two, sometimes conflicting, goals; efficiency of operation and equality of opportunity within the region. The demand for efficiency may lead to a relatively concentrated development, while the demand for equality will lead to a more dispersed development. A method to combine the two goals would be to concentrate the development in a limited number of growth poles, each of which could develop sufficient efficiency and create a congenial environment for modern production while also giving a large number of people access to employment opportunities and services of the centre. The conclusions if this fundamental philosophy is applied in the Study Area are summarised below:-

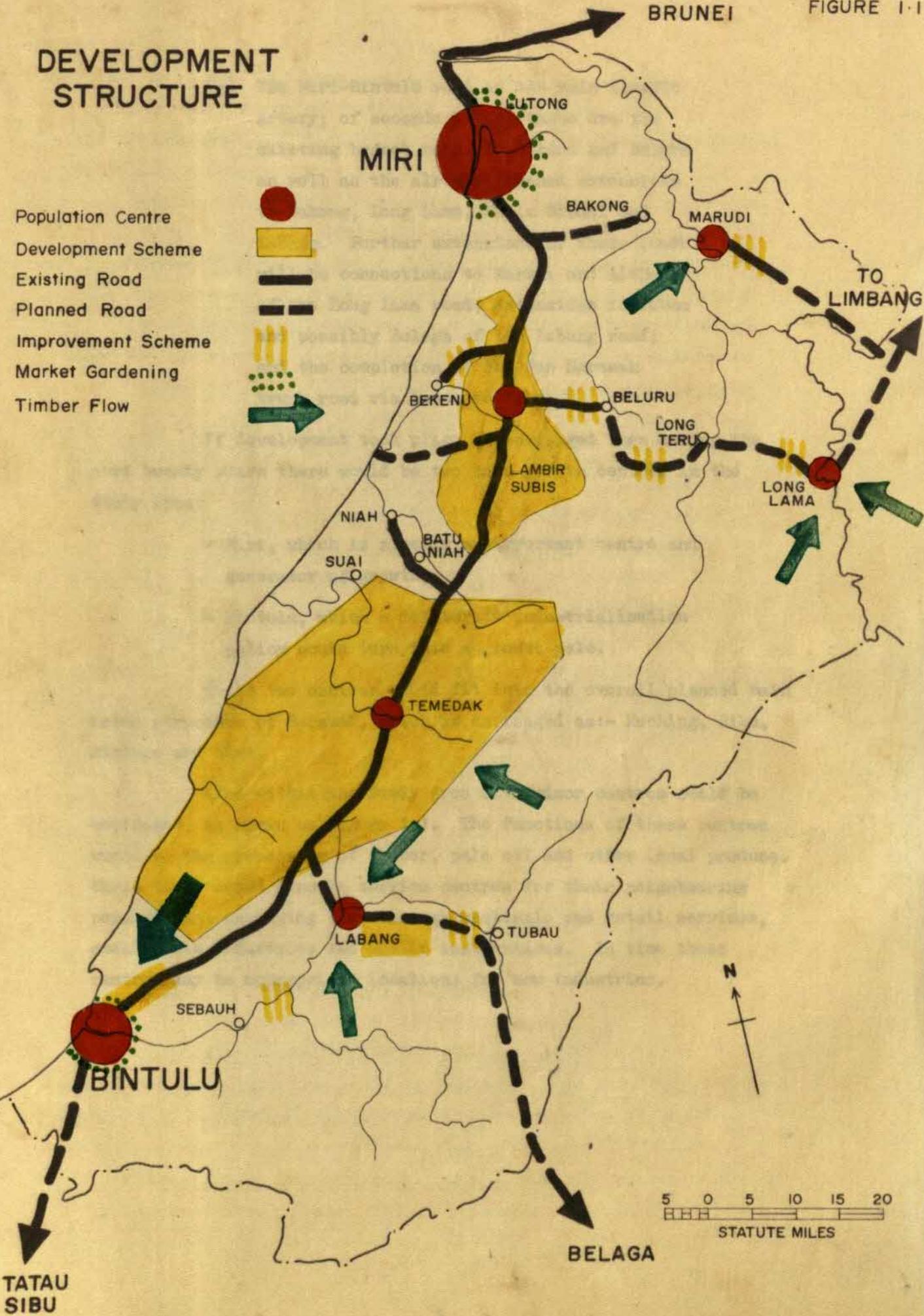
Geographically the development structure of the Study Area would be as shown in Figure 1.1, and would consist of:-

- (a) The main industrial and service development in Miri and Bintulu primarily based on oil, natural gas and timber.
- (b) Large scale agricultural development schemes, mainly but not wholly, on State Land around the Miri-Bintulu road in the area delineated in the Zonation Plan for the commencement of soil surveys. Another concentration might be in the Labang/Tubau area.
- (c) Agricultural improvement schemes located mainly on Native Customary Land (if it is found suitable) around Marudi, Long Lama, Beluru, Bekenu, Sebauh and Labang.
- (d) Immediate timber industrial development in the Temedak area (named after a nearby hill), Labang and Bintulu based on the logging of hill forest areas identified by the FAO Forest Investigation Team as Unit 2.
- (e) Later timber industrial development in Long Lama and Marudi. The former based on the logging of FAO Unit 7, the latter on the peat swamp forest west of Marudi.
- (f) Market gardening around Miri and Bintulu.

BRUNEI

DEVELOPMENT STRUCTURE

- Population Centre
- Development Scheme
- Existing Road
- Planned Road
- Improvement Scheme
- Market Gardening
- Timber Flow



5 0 5 10 15 20
 STATUTE MILES



- (g) The Miri-Bintulu road as the main traffic artery; of secondary importance are the existing branch roads to Bekenu and Beluru as well as the already planned extensions to Bakong, Long Lama, Kuala Sibuti and Labang. Further extensions of these roads will be connections to Marudi and Limbang of the Long Lama road; extensions to Tubau and possibly Belaga of the Labang road; and the completion of the Pan Sarawak trunk road via Tatau to Sibiu.

If development took place as envisaged then during the next twenty years there would be two main growth centres in the Study Area:

- Miri, which is already an important centre and generator of growth;
- Bintulu, which a deliberate industrialisation policy could turn into a growth pole.

These two centres would fit into the overall planned main urban structure of Sarawak, which is envisaged as:- Kuching, Sibiu, Bintulu and Miri.

Also within the Study Area five minor centres could be envisaged, as shown on Figure 1.1. The functions of these centres would be the processing of timber, palm oil and other local produce. These towns could also be service centres for their neighbouring populations, supplying them through wholesale and retail services, small scale industries and public institutions. In time these centres may be appropriate locations for new industries.

The ideas presented in this report will influence the course of the second phase of the Study which largely consists of a semi-detailed master plan for 250,000 acres and detailed project plans for 50,000 acres. The Terms of Reference for this Study indicate that the second phase should deal primarily with unencumbered State Land preferably in one or a few contiguous blocks. However, present thinking confirms the ideas presented in the Zonation Plan and favoured by the Steering Committee, that development should take place simultaneously on State Land as well as on already cultivated land, mainly Native Customary Land. Possible locations for these developments are roughly indicated in Figure 1.1 and are further detailed in a report now being written on "Alternative Strategies for Rural Development". In that report it will be suggested that detailed development plans are produced of representative pilot areas on Native Customary Land, thus providing examples of development approaches which could serve as a guide for extending the techniques to other similar parts of the Study Area and possibly the State of Sarawak. This approach may call for a review of the text of the Scope of Work concerning the second phase of the Study. It is necessary to find an interpretation which meets the needs of the Government for planned schemes to implement soon and guidelines for long term development yet, at the same time, falls within the stipulated services of the Consultants.

CHAPTER 2

THE PERSPECTIVE PLAN

The Terms of Reference for this Study state that a Perspective Plan should be prepared covering a 20 year period for all relevant aspects of development such as population, production, trade, finances, settlement patterns, transport demand and administration. However, neither the concept of a Perspective Plan in itself nor the wording of the Terms of Reference give a detailed and unambiguous guideline to indicate the character purpose and use of this planning tool.

Generally a perspective plan can be regarded as a document setting out over-all targets for economic and social development, including a target rate of increase in total production in order to employ, nourish and supply with goods and services the expected future population of the plan area. The plan may then elaborate these general elements in more detail for various sectors of production, private and public consumption, investments etc.

However, a long range plan of this kind will be operating in a sphere of uncertainty. Therefore, certainty, and exactitude, should not be considered the primary qualities of long range planning. What is more important is the establishment of priorities for different undertakings and the maintaining of consistency in the various perspectives shown in the plan framework; consistency between available resources and the ideas and goals of future living standards including social services, sanitation, environmental amenities etc.

The total planning process can be illustrated diagrammatically as in Figure 2.1 which is divided into three main components:

- I. Establishment of goals;
- II. Programme and implementation;
- III. Control and review.

In a developing society the planning process will be continuous; changes will need to be made as new resources are created, new and improved information obtained and new ideas and wishes developed. In Figure 2.1 this continuation of the planning process is indicated by the vertical arrow, between the main boxes. Only the first of the boxes, Establishment of Goals is concerned with Perspective Planning. In this

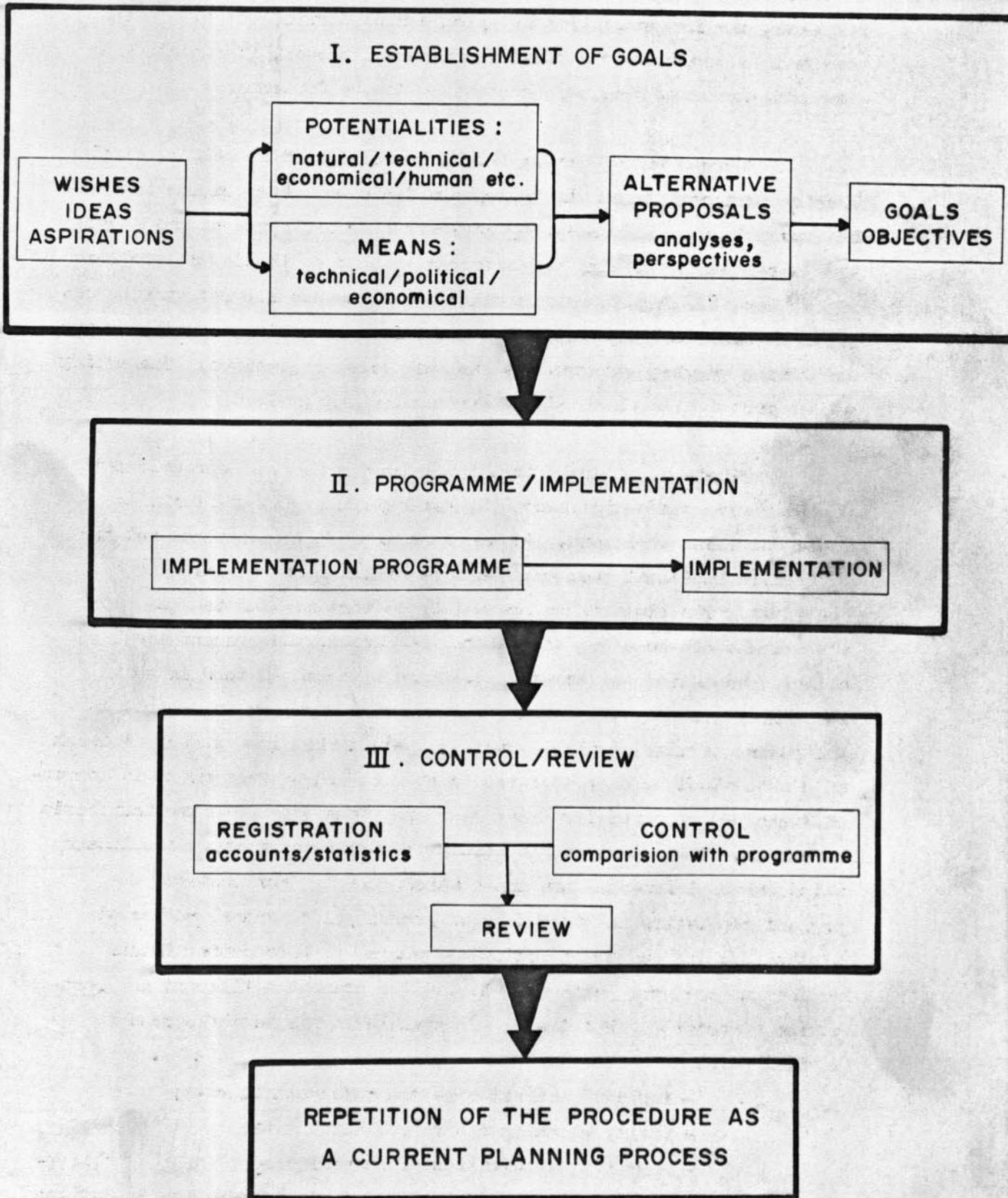
process, wishes, ideas and aspirations of the people are weighed against the available potentials and acceptable means of obtaining them. Through this process an attempt is made to reach realistic objectives, that is objectives which can be achieved by a number of inter-related projects, the implementation of which can be carried out within the constraints governed by natural resources, manpower, financial funds etc using measures which are acceptable to the Government.

Perspective planning should be considered a tool for establishing contact between the policy and decision makers on one hand and the investigating and analysing advisors or consultants on the other; the latter people working out alternative ways to tackle the problems and achieve the objectives, in other words the development strategies. There may well be many strategies combining the various possible means and giving varying importance to the different objectives. The policy makers must decide which of the strategies they prefer.

There is no doubt that the future social and economic pattern of the region can be influenced by human decisions and efforts to implement these decisions. At the same time these decisions and the efforts to implement them must be kept within certain limits to be realistic. The limitations are set by factors such as the geography and climate of the area, the natural resources, the present level of culture, education and experience. Some of these factors like the last three are only temporary constraints on development, which, in the course of time, could be overcome, while the first three, although of a more absolute character, could be modified by such means as improved transport or careful regeneration and conservation of certain basic resources. It is part of perspective planning to identify the factors which can be influenced and those which cannot. For instance the present population and its natural growth (i.e. annual number of births less the number of deaths) is a clue to forecasting future social and economic patterns. So are the present settlement and occupation structures. But the future structures can be influenced in several ways:

- improved medical care can reduce death rate;
- family planning can reduce birth rate;
- improved exploitation of natural resources or establishment of new manufacturing industries can give incentives for in-migration to the area;

THE PLANNING - PROCESS



→ education and vocational training together with investment in industries can contribute to a change in occupational structure.

However, the prospects of applying these measures will be limited because it takes time to change the attitudes of the population so that the new techniques are accepted, and when accepted it takes time to apply the techniques in the reshaping of the nation in accordance with the desired objectives.

Although financial constraints may be essential, especially in connection with financing import of goods and services for development, they have not been treated here. This report is primarily concerned with real conditions, i.e. quantity and quality of natural resources and the ability to organize human efforts to exploit these to the benefit of the population; not with the monetary system for channeling the movements of goods, labour and services.

The ability to draft alternative realistic future social and economic patterns depends on the quantity and quality of information on relevant development factors. The sources for information are the published official statistics; information from the various public departments and information collected through special investigations. Whereas all the information must be processed and evaluated in order to establish a foundation for assumptions on future development the perspective planning primarily treats the problems in broad outline and round figures and leaves the details for later studies and considerations.

Should we give the Client a lecture in the basics of Development Planning? I feel that Chapter 2 does not attempt to do more than that. It also rather distracts the reader from the object of this paper, that is: - Development Strategies.

CHAPTER 3

DEVELOPMENT STRATEGIES

3.1 General

The concept of "strategy" in the context of planning is used in several different ways, but as explained in Chapter 2 it is here taken to mean the answer to the question:

- what shall we do to obtain our goals? or
- what will we obtain if we act in such and such a way.

Broadly it is a description of a main line of action and of the results which can be expected from the action. By considering alternative strategies it will be possible to examine various degrees of objective fulfilment, and combinations of different measures and actions that can be applied for obtaining the expected results.

The various objectives of development can be mutually supporting or they can be overlapping and even conflicting. There can be many different means applicable for achieving the goals, but with varying side effects and varying political acceptability

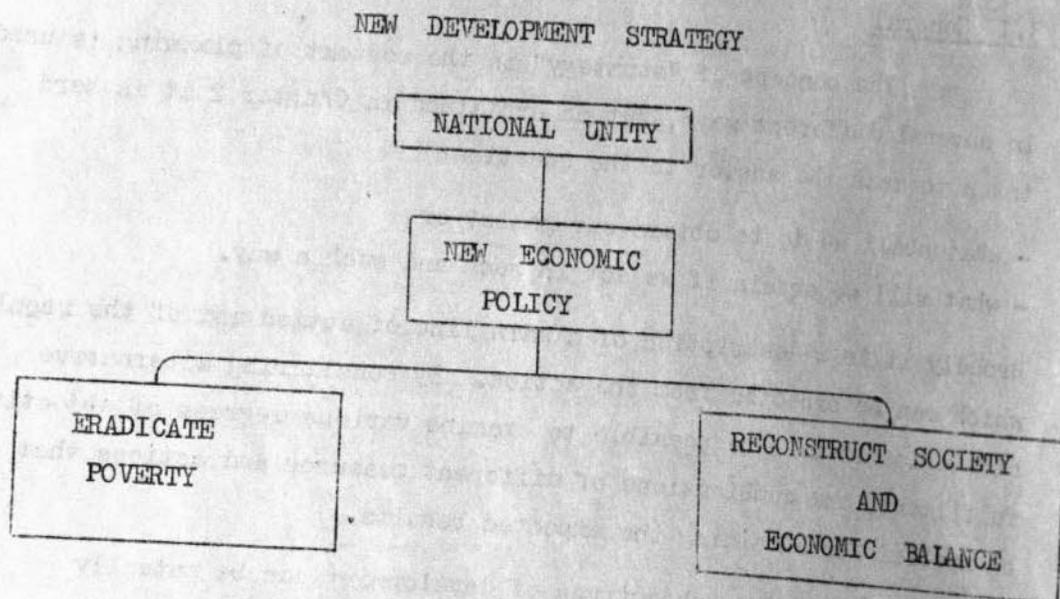
A strategy, therefore, need not attempt to achieve maximum fulfilment of all the separate objectives; that would usually be impossible; but it attempts to coordinate the approaches to the objectives in a balanced way.

When a strategy has been chosen policies and programmes must be worked out as shown in figure 2:1 presenting more specific ways and means to be applied and actions to be undertaken in the near future as concrete steps on the way to the goals.

3.2 The Malaysian National Development Strategy

The national development strategy is laid down in the Second Malaysia Plan (1971-75) and is designated the New Development Strategy. This is a hierarchy of goals, where a goal of lower order is a step to achieve goals of higher order. The lower order goals are more specific than the higher order ones. Figure 3.1 indicates the general goals of this New Development Strategy.

Figure 3.1



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.

The eradication of poverty will be obtained through;

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

The Second Malaysia Plan mentions several policies for raising the income and productivity of low income groups, for example in agriculture the introduction of new crop cultural techniques, double-cropping, 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 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.

3.3 Development Goals and Strategies for Sarawak

Generally Sarawak identifies itself with the rest of Malaysia and therefore also with the goals and strategies already described. Expressions of this attitude can be found in many official statements, for instance in the Chief Minister's budget speeches to the Council Negri.

3.3.1 Sarawak Development Plan 1964- 1968

The Sarawak Development Plan (1964-68), published in 1963, states a number of objectives, of which several still seem to be valid:

"To improve the farmer's livelihood and make the countryside a pleasant place to live in;

To provide employment for the country's population of working age;

To raise the per-capita output of the economy and to protect per-capita living standards against the adverse effects of a probable decline in rubber prices;

To widen the variety of Sarawak production, emphasising the development of other suitable agricultural products in addition to rubber and also giving encouragement to industrial expansion;

Finally, while stressing the importance of development which will meet production and employment requirements, to improve and expand the social services needed to provide educational opportunities for the rapidly growing school-age population, to extend the public health services over a wider coverage of the rural as well as urban population, and to provide more adequately for rural utilities."

A special feature in Sarawak's production and economy is the shifting cultivation of hill padi. The 1964-68 Plan for Sarawak says that "There is no strategic argument for continuing hill padi cultivation as the fertility of the soil is gradually being reduced by it. If hill padi areas were allowed to revert to jungle and regenerate completely they would have greater potentiality for producing rice in a time of emergency than if they had been farmed continuously. In many areas, where the soil has degenerated, it is likely that the return on labour devoted to hill padi is so small that the price of, for example, rubber would have to fall to a low level before it became a less remunerative crop than hill padi."

The conclusion of the Plan was that the national income would grow by four per cent annually, while the population was expected to grow by 3.2 per cent annually, leaving only a 0.75 per cent annual increase in per capita national income. In the Second Malaysia Plan (1971-75), the national income per capita is planned to grow by a considerably higher amount, namely 3.6 per cent annually with an expected 2.9 per cent increase in per capita purchasing power.

3.3.2 Agricultural Development

The 1964-68 Plan identifies two main types of agricultural development schemes:

- opening up new land for agriculture;
- better use of land which is already being farmed.

For the former type of development planned settlement, where roads and social facilities are provided in advance, is recommended. For the latter type the Plan states "Every encouragement must be given to the planting of padi on swamps instead of on hills; the steeper hills should be planted with tree crops (rubber) or allowed to revert to jungle, and other varieties of agriculture such as livestock and fruit-growing, should be encouraged."

The plan furthermore says; "Again it is clear that the concentration of effort on an area selected as being likely to be capable of responding, is the best way of tackling this problem. For example, the results of the various subsidy schemes for planting rubber, coconuts and padi, and for farm improvement, are likely to be better if these schemes are supported by the work of agricultural extension teams. Furthermore, it is certain that the services of Government staff will be at a premium, and concentrating attention on one area at a time will help to make the best use of the available man-power. To take another example, considerable expansion is proposed in the way of agricultural credit and co-operative marketing. This will be of most use in areas which are advancing agriculturally, and conversely, agricultural improvements will be encouraged and supported by the availability of credit and improvements in commercial arrangements."

Much importance is given to "making the countryside a pleasant place to live in." The Plan says: "With improved standards of farming, it will be possible for a development area to support a fairly dense population, which in turn will make it feasible for Government to provide amenities. This has particular relevance to the native communities changing from hill-padi to more intensive farming. These populations have been especially scattered - and it has therefore been especially difficult for Government to help them - because of the large acreage of land needed to support each family. As they change over to more intensive agriculture, it will be possible for them to live closer together, and development areas should be a means of offering them the advantages of living near (or even in) villages.

Adoption of intensive agriculture will enable the native farmer to get a better income from a smaller area of land, but it still will not enable Government to provide him with amenities unless there is (or will be) a community of sufficient size and density to justify them. The key to this problem is in the layout of the holdings which are to be intensively cultivated and these must, from the outset, be arranged so that such a community can be based upon them. It is in fact impossible to separate the two aspects, and the planning of schemes in areas at present being farmed by traditional hill padi methods must be based on the twin aims -

- (i) to improve the farmer's livelihood by enabling him to take up intensive agriculture; and

- (ii) to make the countryside a pleasant place to live in by providing amenities."

As a means to obtain this it is recommended in the Plan, that many such schemes should involve of redistribution of land holdings.

The goals and strategies contained in the above quotations still seem to be generally valid. Since publication of the Plan, there has been a discussion in the State Government on the adequacy of the Land Code of 1957 as an instrument for agricultural development. A Land Commission convened in 1962 recommended a number of changes, which however did not find sufficient political backing when presented to the Government in 1965. Nevertheless it is still Governments' aim to modernise agriculture and to reduce the practices of shifting agriculture. This is to be achieved through education and persuasion, which implies agricultural extension services, credit facilities, marketing arrangements etc. These matters are further elaborated in the paper being prepared on "Alternative Strategies for Rural Development".

3.3.3 Forestry, Mining, Manufacturing, Trade and Commerce

Parallel to agriculture, a development of the activities mentioned in the heading is foreseen by the Government.

Forest exploitation has been carried out for some time, based primarily on the export of logs. It has, however, been made clear in recent political statements that the wood reserves of the State should to an increasing degree become the basis for local timber and wood manufacturing industries. The recommendations resulting from the FAO forest team's present studies are likely to influence decisively the goals and strategies in the forestry sector.

Apart from the offshore mineral oil and natural gas deposits, Sarawak does not seem to hold mineral deposits of any great importance to the economy. Development of manufacturing industries must therefore be based largely on processing of timber and agricultural products. These industries should be developed gradually from initial simple processing into more and more advanced manufacturing.

Could these not affect the agricultural sector?

It may be necessary also to look for industries which are not primarily based on local materials or other natural advantages, the so called, - "footloose"-industries. Manufacturing of components for electronics and other complicated and highly advanced machinery are examples. Such industries are particularly sensitive to labour costs, but relatively insensitive to transport costs. Nevertheless with Sarawak's globally remote location compared to the industrial centres of the world, it is not likely that foreign investors would, by themselves, find their way to Sarawak for that purpose. But with more and more industries settling and developing in West Malaysia, it might be possible to induce some of those to locate subproductions in Sarawak. A well functioning transport system is a primary prerequisite for this kind of industrialisation.

3.3.4 Location of Economic Activities

The location of economic activities is, to some extent, a result of natural conditions. Forests and land suitable for agriculture must be exploited where these resources are found; similarly, mining activities must go to the deposits. The selection of areas to be exploited first will be influenced by development of transport systems - and vice versa. However, manufacturing and other urban trades can normally be located where it is considered desirable by the investor or the society.

It is a generally accepted aim by the Federal and State Governments to spread the economic activity throughout the State, with special emphasis on a limited number of well equipped 'growth poles'. In Sarawak, these should be Kuching, Sibul, Bintulu and Miri. These towns will eventually be connected with a main road system; they are already connected by an internal air line system.

3.4 Development Strategies for the Study Area

The development goals and strategies for the Study Area have been broadly laid down in the Terms of Reference, quotations from which are;

"It is the intention of the Federal Government and State Government of Sarawak that this region be developed, primarily to permanent agricultural settlement and large scale forest management, exploitation and processing, and to other economic activities which a close study of the region may show to be viable."

"The plans will encompass public and private investment consistent with financial and managerial resources, and give special emphasis to the urgent need to improve the economic position of the rural population in the State as a whole and minimise rural under-employment and uneconomic practices. This emphasis is to be commensurate with the resettlement of the greatest number of people on holdings sufficient to provide reasonable incomes and to induce incentives for higher productivity and progress either through traditional, but greatly modified and more economic practices, or through the introduction of more modern agricultural systems, depending upon the social inclinations of particular settlement groups."

Agricultural development is clearly emphasised as the central initial theme and forest exploitation as the second major activity. "Processing of timber and agricultural products should be done within the region as much as possible, to form the basis of a future manufacturing industry. The establishment of other industries must follow whenever opportunities appear attractive."

The development of land and creation of employment opportunities will be carried out "to accommodate settlers, the majority of whom are expected to come from the First, Second and Third Divisions, at the same time safeguarding the legitimate interests of present farm communities in the region."

It has been found convenient to discuss development strategies for the Study Area with respect to five main aspects:

- scale of development;
- occupation structure;
- geographical distribution of development;
- policies and programmes for development;
- development in time.

These items are discussed with varying intensity in the following subsections depending on how much attention has been given to the subject so far. As the Study proceeds, considerations will continue on those subjects not yet fully covered.

3.4.1 Scale of Development and Occupation Structure

There is a close relation between these two first aspects; the first is concerned with the scale of development within the Study Area compared with that in Sarawak as a whole. Important factors to be discussed are the number of employment opportunities to be created within the Perspective Plan period, the total number of in-migrants to the Study Area, the use of its natural resources, the acreage of land to be developed for agriculture, the scope of forest exploitation and the total cost of development accruing from this development. The second aspect is concerned with the relative importance of the various main sectors of production, i.e. how many persons will find occupation within agriculture, forestry manufacturing industries, trade and commerce etc.

In the background material, accompanying the Terms of Reference, it was estimated, that the Study Area "... includes approximately 1 500 000 acres of land that is believed to be suitable for agriculture, of which approximately 1 000 000 acres is unencumbered State Land that is not under cultivation at present". These estimates have been modified considerably by the Zonation Plan studies, see Table 3.1, which indicates a total area of land possibly suitable for agricultural development, outside the Lambir-Subis Scheme, of around 863 000 acres, which is less than 60 percent of that expected. The area of totally unencumbered land - i.e. that which is available for almost immediate development and therefore without Native Customary Rights or reservation for Permanent Forest, (categories 3, 4 and 9 in the Table) - is (205 000 acres) or 20 percent of the acreage expected.

→ Why bring this point up again? It has already been covered by the Z.P. The information contained in the background material to the Terms of Reference were a rough estimate mainly based on old photography of small scale. Let us not misinterpret or give more value to information which the source, in this case L&S and Soil Survey Div. did not attach to it.

in line 5 & 6 (p. 21) you are recognizing the fact that soil quality in the 863,000 acres of possibly suitable land have not been considered, yet in the 2nd paragraph you are happily using this figure without qualification

TABLE 3.1 ACREAGES OF LAND CATEGORIES IN THE STUDY AREA

Land Categories	Possibly suitable for Forestry acres	Possibly suitable for Agriculture acres	Total acres
1) Hill Forest Reserve and Protected Hill Forest	826 000	144 000	970 000
2) Proposed Hill Forest Reserve	123 500	21 000	144 500
3) Currently licenced exploitable hill forest	120 000	60 000	180 000
4) Currently licenced remnant hill forest	121 500	65 000	186 500
5) Communal Forest	500	NIL	500
6) Swamp Forest Reserve	242 500	NIL	242 500
7) Native Customary Land	372 500	451 000	823 500
8) Titled Land	67 500	42 000	109 500
9) Unencumbered State Land including Interior Area Land	360 500	28 000	388 500
Mixed Zone Land	96 000	36 000	132 000
Native Area Land	124 000	16 000	210 000
Sub-total	2 524 500	863 000	3 387 000
10) Lambir-Subis	21 000	144 000	165 000
Total	2 545 500	1 007 000	3 552 500

MIRI BINTULUTED
INTERNAL MEMORANDUM

FROM: I. L. A.
R. D. Law
C. P. Lin

REFERENCE MB/ 3/SOILS/

SUBJECT:

With reference to paragraph 2

a) Soil area assessment had to be done with a few computations

b) A (Soil Survey

c) A has shown the original indications

Therefore agriculture 21 of the above a more realistic

The gross area of 194 000 acres is all suitable for structure, and to not more than 12 cultivate 12

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This is unfounded: evidence suggests that reduction will be the case: small net increase will not occur

Source of this figure?

(Ref. Z.P. page 5)

See Interim Memo. from 11, RDL & CR d.d. 4/1-72 in SOILS/REPORTING & LUP File.

ILAY/al

MIRI BINTULUTED
INTERNAL MEMORANDUM

MIRI BINTULU PROJECT

INTERNAL MEMORANDUM

FROM..... I. L. A. Ysselmiden.....
R. D. Law
C. P. Lim

TO..... G. J. Mathiesen, N. Cooper.....
S. Jorgensen

COPY TO.....

REFERENCE MB/ 3/SOILS/REPORTING, LUP

DATE 4th January, 1973

SUBJECT..... Reduction of Agriculturally Possibly Suitable Land
due to Soil Factors.....

With reference to the Association Paper "Development Strategies" page 21 paragraph 2 we would like to bring the following to the author's attention.

a) Soil surveys in the Johor Tenggara Project have shown that of the total area assessed to be suitable for agriculture a deduction of approximately 20 per cent had to be applied for adverse soil conditions.

b) A similar percentage was deducted in the Sungai Sekaloh-Tangap Area (Soil Survey Division Report No. 149, May, 1972), also for adverse soil conditions.

c) A quick exercise on soil conditions, mainly soil depth, in Sample Area A has shown that roughly 10 per cent has to be deducted from the total area originally regarded as possibly suitable for agricultural development. There are indications that this figure could be higher in Sample Area C.

Therefore, the figure of 205 000 acres assessed as possibly suitable for agriculture (ref. Zonation Plan, page 5 and 6) has been used incorrectly on page 21 of the above paper. Based on (a), (b) and (c) above, 164 000 acres would be a more realistic figure.

The gross acreage including Lambir-Subis area (30 000 acres?) will then be 194 000 acres and not 235 000 acres, assuming that the 30 000 acres in Lambir-Subis is all suitable for agriculture. The net acreage after deduction of infrastructure, swamps etc. will then be 155 200 acres. This area will give employment to not more than 12 900 persons, assuming that one fully occupied person can cultivate 12 acres of land.


I. L. A. Ysselmiden
Senior Land Classifier

ILAY/al

The criterion for agricultural suitability has been primarily the topography of the area, as assessed by aerial photographic interpretation, which has taken account of the height of hills and gradient of slopes. The quality and depth of the soil has yet hardly been considered. During further soil surveys it is expected that the 863 000 acres of possibly suitable land will be reduced. However, further investigations into the Study Area may also reveal smaller patches of suitable agricultural land, which have not yet been identified or are too small to map at the scale used, and which in total may be greater than the reduction due to poor soil. To this amount should be added suitable land within the Lambir Subis Scheme not yet developed. It is estimated at around 30 000 acres.

This is unfounded: evidence suggests that reduction will be the case: small in net income will not deny

Source of this figure?

The importance of these figures might be illustrated by a few computations based on rather rough assumptions taken from a number of Working Papers. (see reference list)

- if development is restricted to the totally unencumbered land: 205 000 acres and to the remaining Lambir-Subis area: 30 000 acres; and
- if these 235 000 gross acres correspond to around 190 000 net acres, applying a factor of 0.8 for land being used for roads, villages etc; and
- if one fully occupied person can cultivate 12 acres, then 16 000 persons could be employed on this land, giving a direct livelihood to a total population of around 45 000. This conclusion is based on the following relationship between total population (P) and labour supply (LS), i.e. the number of persons who want to be gainfully occupied:

(Ref. Z.P. page 5)

See Intern Memos. from 1/1, RDL & CR d.d. 4/1-73 in SOILS/REPORTING & LUP Files.

$$P = LS \times 2.86 \text{ or}$$

$$LS = P \times 0.35$$

In addition, this direct increase in employment would be accompanied by a derived employment from work generated by supplying and servicing the primarily employed persons. This has been estimated at an amount equal to the primary employment. The total number of persons employed by developing the 235 000 acres would therefore amount to 32 000 and the total number of persons having a livelihood would amount to around 90 000. These will not all be immigrants, however, because the natural growth in 20 years of the present population of the Study Area must also be accounted for. At an annual growth rate of 2.7 percent the present population would increase by 80 000, leaving space for an in-migration from other parts of Sarawak of only 10 000. This is not a significant number when considering that the natural growth of population in the rest of Sarawak, during the same period, will have been about 600 000.

This example suggests that any major agricultural development in the Fourth Division aimed at absorbing considerable numbers of people from the rest of Sarawak should therefore be based also on other lands, for example;

- (a) - lands possibly suitable for agriculture within 'Hill Forest Reserves, Protected Hill Forest and Proposed Hill Forest Reserve', (categories 1 and 2 in Table 3.1) which total 165 000 acres. Using the same assumptions as before, the development of these areas would lead to a total employment, direct and derived, of 22 000 persons and a total population accommodated of up to 65 000. This, together with the 10 000 possible net in-migration from the 235 000 acres, gives a total of 75 000 persons who could be accommodated from other parts of Sarawak and accounting for roughly 12 per cent of the increase in population (1971 - 1990) in the rest of the country.

not all of this
is suitable

Since you have been using the incorrect average figure of 235,000 your total number of persons supplying services to those employed in development is not 32,000. Consequently the in-migration of 10,000 from other parts of Sarawak is also too high

(b) - a better utilisation of the Native Customary Land consisting of an area, possibly suitable for agriculture, of around 450 000 acres. Living within the total area of Native Customary Land, roughly 823 500 acres, consisting of possibly suitable and unsuitable land there are estimated to be 60 000 persons or about 11 000 families. Assuming this whole population was to be settled within the area found suitable for agriculture then each family could have about 40 acres. If in the perspective plan period an average allocation of land of 12 acres per family could be considered reasonable, then the present population occupied with shifting cultivation could be settled on a total area of around 135 000 acres, leaving 375 000 acres for another 140 000 settlers if each family were given the same acreage. These people could be expected still to cater for their own subsistence with elementary goods, so that only a smaller part of their activity would be directed towards the cash or money economy. The derived employment would therefore be smaller, say only corresponding to a total number of 60 000 persons. The total number of people accommodated would then be 200 000, corresponding to 30 to 35 per cent of the population increase (from 1971 to 1990) in the rest of Sarawak.

*have been
You h... assuming
that 12 acres is
the right holding
size. Has any
work been done
on this?
How do you propose
to do this as you
are giving them
only 12 acres,
without supporting
them initially.*

Adding the figures under (a) and (b) will result in a total accommodation of 265 000 persons, or 45 percent of the population growth (from 1971 to 1990) in Sarawak outside the Study Area. The total population in the Study Area could be presented as shown in Table 3.2.

Table 3.2 LAND DEVELOPMENT AND POPULATION INCREASE

	persons	persons
Population 1970		115 000
- increase from:		
235 000 acres	90 000	
a) 165 000 acres	65 000	
b) Native Customary Land	200 000	
Total increase		355 000
Total population 1990		470 000

*This table is
non-sense since
it is based on
the incorrect
acreage figures*

Why waste. This
pages of incorrect
assumptions to find at
and that it didn't
get you any where

The total increase would correspond to an annual growth rate of seven percent. More than half the expected growth of population in Sarawak would in this way be accommodated within the Study Area.

This appears unrealistic for several reasons:

- (1) - an extreme strain would be put on the administration and other public agencies in the Study Area;
- (2) - the population growth rate in the rest of Sarawak would be reduced to 1.7 percent annually, with consequently a relatively slow economic development. This would probably not be acceptable and would be counteracted by individual and political initiatives for development of these areas. The conclusion that seven percent growth is unrealistic could, however, be modified by a deliberate policy of in-migration to Sarawak from West Malaysia if conditions in Sarawak, from a national point of view, were considered more attractive for development than in West Malaysia;
- (3) - the shifting cultivators may not be prepared to accept the settling of themselves for the benefit of others on the present Native Customary Land, at least not to the extent envisaged here;
- (4) - However, if they were so prepared, then resettlement and relocation of similar people could take place on suitable lands in the other parts of Sarawak, thus reducing or even abolishing in-migration to the Study Area for the reason of land shortage;
- (5) - as a development of basic economic activities in other sectors, such as forestry and manufacturing must be expected - and is considered desirable - then this would lead to an even higher total growth in the Study Area.

are are very
areas success
d apart from
4th Division

For these reasons calculations have been made, based on estimates of the present occupation structure, presented in Table 3.3, to forecast the possible occupation structure in 1990 assuming two lower rates of population growth, namely four per cent and five per cent annually. The results of these calculations which are given in Table 3.4 imply an in-migration to the Study Area of about 60 000 and 110 000 persons respectively over a 20 year period.

Table 3.3 PRESENT OCCUPATION STRUCTURE⁽¹⁾

	No. of persons	Percentage of total persons
Agriculture		
traditional	21 000	45.6
modern	<u>4 000</u>	<u>8.7</u>
total	25 000	54.3
Forestry	2 500	5.4
Fishing	450	1.0
Manufacturing and Mining	4 000	8.7
Construction	750	1.6
Transport	1 500	3.3
Private Services	4 800	10.5
Public Services	2 000	4.3
Occupation not stated	5 000	10.9
Total	46 000	100

Note 1. Based on data from the 1970 Population Census together with locally collected information.

The traditional or low productivity sector of agriculture, which primarily consists of padi planters, is considered corresponding to only two thirds full time labour supply or 14 000, thus reducing the total full time labour supply to 39 000. 'Occupation not stated', 5 000 persons, have been distributed on the active sectors proportionally. For the sake of simplicity and convenience the above estimates in Table 3.3 have been grouped under 4 headings, as shown in Table 3.4 where:

- Agriculture is full time labour supply in agriculture;
- Forestry is forestry and fishing;
- Manufacturings is manufacturing, mining and construction;
- Services are private and public services, including transport;
- Population is total population.

What have soil conditions at this stage to do with Occupation structures, and where did you get this information from.

Table 3.4 shows possible future occupation structures in the Study Area. These patterns are not the result of objective calculations, but the figures are the modified results of judgements based on knowledge of a number of details concerning aspects such as soil conditions, FAO's ideas about the future development of forestry, etc.

With an assumed rate of natural growth of Sarawaks' population of 2.7 percent annually from 1971 to 1990, and with the total population shown in Table 3.4, the total population in the Study Area would constitute the following percentage of Sarawaks' population:

	Total population in Study Area	Percentage of Sarawak
1970	115 000	12
1990 at four percent	243 000	15
1990 at five percent	295 000	18

Both population growth rates would result in an increasing importance of the Study Area. This four percent growth rate would imply the absorption into the Study Area of eight percent of the natural growth in the rest of Sarawak; and at a five percent growth rate it would absorb 17 percent.

Table 3.4 shows that all main occupation sectors are expected to grow, but at varying rates. Although agriculture takes nearly half of the total increase in Labour Supply, it is expected to grow at a lower rate than average.

Behind the figures of Table 3.4 lie a number of considerations which could be summarised as follows:

(1) Agriculture

At a four percent population growth rate and with an average number of acres per occupied person as mentioned the increase in agricultural occupation would imply a development of around 75 percent of all possibly suitable state land (305 000 (12 x 20 300 x 1/0.8) acres out of 400 000). Part of this development must be for market gardening, rearing of poultry, pigs, cattle and the like for the supply of a growing urban population and people working within specialised agriculture (e.g. oil palm estates). This local supply agriculture could also be developed on that Native Customary Land which has good access to the relevant markets, thus leaving more, State land for development by in-migrating settlers.

is will contribute a small amount, and my mind is capable

Table 3.4 FUTURE OCCUPATION STRUCTURES

	1970		1990				Average growth rate four per cent				Average growth rate five per cent			
	Labour Supply thousand	percent of total	Labour Supply thousands	percent of total	Increase in Labour Supply thousands	annual growth rate percent	Labour Supply thousand	percent of total	Increase in Labour Supply thousands	annual growth rate percent	Labour Supply thousand	percent of total	Increase in Labour Supply thousands	annual growth rate percent
Agriculture	20.7	53	41	48	20.3	3.5	50	49	29.3	4.5				
Forestry	3.5	9	11	13	7.5	5.9	13	13	9.5	6.8				
Manufacturing	5.5	14	17	20	11.5	5.8	20	19	14.5	6.7				
Services	9.3	24	16	19	6.7	2.8	20	19	10.7	3.9				
Sub Total	39.0	100	85	100	46.0		103	100	64.0					
Total Population	115.0	-	243	-	128.0	3.8	295	-	180.0	4.8				

The five percent population growth rate would give 9 000 more occupied persons in agriculture; this situation could be achieved partly by developing a greater percentage of state land and partly by a better utilisation of Native Customary Land. This development could be aimed at supplying the growing population, but could also be for production of food for export to large consumption centres, such as Singapore, Saigon, Hong Kong and Japanese cities.

The agricultural development foreseen in both situations assumes a considerable input of extension services, credit and marketing facilities accompanying large scale development schemes. These aspects are further dealt with in the paper on 'Alternative Strategies for Rural Development'.

(2) Forestry

In both situations forestry is expected to grow considerably. The FAO forest team has estimated the total increase in employment in all sectors of timber production, logging, transport and manufacturing, at 30 000 persons. Ten to eleven thousand of these new jobs are expected to be located in the Study Area with three to four thousand in manufacturing, and the rest in logging and transport, i.e. forestry. It has been assumed that the forest industry will expand also in the swamp forests and possibly in Native Customary Land unsuitable for agriculture. Another assumption is that plantations could be developed on logged land not suitable for agriculture.

(3) Manufacturing etc.

The main industries considered are extraction and processing of oil and natural gas; the processing of palm oil and products from other crops, timber and wood; also taken into account are all the different auxilliary productions and mechanical services supporting the primary industries, and finally the supply of some manufactured goods to the population in the Study Area. Building and construction activities are expected to increase considerably as well as small scale industries, some of which in the course of time may develop to supply larger markets. Processing of food for export may become important. Industrialisation on a scale indicated by the figures in the Table assumes a deliberate policy by Government which would include development of urban areas, increased transport facilities and an adequate education and manpower training programme.

What about
your competitor
will be considerably
higher than
say Taiwan

(4) Services

This sector consists of a number of private and public functions which are dependent on the level of economic activity and the income level within an area. Both these factors are expected to grow; consequently this sector must also grow. The growth rate, however, has been kept on a rather moderate scale in the table because the sector is considered at present to employ more people than necessary for carrying out its functions. By increasing efficiency a higher output could be obtained with a moderate increase of manpower. The public sector will also expand but not necessarily parallel to the growth of population.

Generally the pictures shown by the two situations are a moderate relative decrease of agriculture from 53 per cent in 1970 to 48 or 49 per cent in 1990, and a corresponding increase in forestry, so that the share of total labour supply accruing to these two sectors is practically unchanged: 62 per cent in 1970 and 61 or 62 percent in 1990. Accordingly the urban sectors manufacturing and services, in total are also unchanged. This may seem to be meager result from a modernisation process. However, there are explanations for this apparent lack of change:

- (1) The reduction factor for underemployment having been applied to the present agricultural population means that in fact around 7 000 more persons than are indicated in Table 3.4 are absorbed into the agricultural and forestry sectors which together count for 68 per cent of the presently occupied persons;
- (2) it is assumed and expected that low productivity agriculture will be partly replaced by more up-to-date and productive cultivation practices;
- (3) development of agriculture and forestry has been given high priority in the Study Area by the Government;
- (4) forest occupation may have been overestimated at the cost of manufacturing and services;

- (5) the calculations assume full employment of the total Labour Supply, which could be considered unrealistic and unnecessary. An average unemployment of five percent would reduce the employment in 1990 by 4 000 to 5,000 persons, and accordingly also reduce the necessary investments in new work places.

Generally therefore the situations represented in table 3.4 imply a considerable development and modernisation of the Study Area. If the soil surveys prove the soils to be largely of good quality, there would seem to be sufficient state land to cater for the higher development alternative (five percent growth rate) and there would still be considerable reserves in the Native Customary Land for the future. The State might be able to initiate acceptance, by the shifting cultivators, of settled agriculture on only part of this land by combining, as a bargain with the people, the building of access roads, social amenities, and a wide range of development supporting services such as improved agricultural extension, providing improved seeds, plants, breeding animals etc. and credit, supplying water, electricity, processing and marketing services, hospitals and schools.

This is important because to obtain a balanced social development the existing population in the Study Area must also be led into a modernisation and improvement process. The Native Customary Land, the bazaars, the small and maybe uneconomic sawmills and other industries must all receive some of the attention and funds for development. This widespread approach will influence the geographical distribution of activities which is the subject of the following sub section.

3.4.2 Geographical Distribution of Development

Development considerations will often have to meet a conflict between demands for efficiency and for equality. It may, in the short run, be more efficient to locate new activities - production, institution etc. - in already developed centres or areas, thus leaving the outsiders undersupplied with amenities and facilities. More equal conditions for people in all parts of the country call for a more wide spread development.

There is no general or final solution of this conflict, but it is today widely accepted both internationally and by the Malaysian Government, that development should be reasonably well distributed to all parts of the country and undesirable concentration in and congestion of one or a few cities avoided. At the same time urban development needs to be concentrated on a limited number of growth poles, to enable efficiency and good economy to expand.

In the "Preliminary Report on the Delineation of Sarawak into Viable Planning Regions" by The Planning Division Land and Survey Headquarters, 1971, the broad settlement pattern in Sarawak is outlined in four main "growth poles": Kuching, Sibul, Bintulu and Miri which are served by the Pan Sarawak trunk road as the main artery. Within this framework for regional development, the Study Area will rely on Miri and Bintulu as its main generators of economic growth. The former is already a growth pole, the latter could be made into one through a deliberate industrialisation policy.

In the development of Sarawak and the Study Area it is necessary to emphasize the importance of centres which can generate spread effects to an entire region and react positively to a development in their hinterland. Hence, in order to create growth in the Study Area it is important to canalise industrial activities into Miri and Bintulu, so that a modern industrial environments can be established within them. As far as possible the industrial and agricultural development should be located in a way that they can support each other. For instance, in order to make Bintulu grow faster than future industrialisation alone would account for, major agricultural developments should take place sufficiently close to the town that it would serve as a trade and service centre for the agricultural population, who in turn would support and enjoy its growing supply of services. This would create a positive interaction between the population engaged in primary and non-primary activities.

However, the areas of unencumbered State Land with possible agricultural potentials are located too far from both Bintulu and Miri to have any direct supporting effect on their development and vice versa. It is therefore considered necessary for, the population connected with large scale agricultural development to have two or more separate centres for the supply of basic services. One centre would be in the Lambir-Subis area and another possibly where the Miri-Bintulu road crosses the Batang Suai.

To obtain population growth rates of even four or five per cent per annum, as is explained in Section 3.4.2, demands development of a considerable part of the suitable and unencumbered State Land which has been identified. Thus, during the twenty year period a large scale agricultural development of Blocks A4, A5 could be envisaged. (These development blocks are illustrated in Figure I.1 in Appendix I)

Nevertheless to fulfil the agricultural requirements created by a five percent increase in population it may be necessary to spread development to areas of shifting cultivation. Ideally this would lead to a relocation and concentration of the people presently engaged in shifting agriculture, onto a smaller total area and practising a viable system of settled agriculture. Such development should be attempted as widespread as is possible in order to limit migration within the Study Area and provide a more geographically balanced population growth.

The effects of various types of development on the geographical distribution of employment creation and population growth and on the settlement pattern in the Study Area are discussed in chapter 5, Development Potentials of the Planning Units.

3.4.3 Development in Time

The phasing of development over the perspective plan period can be roughly demonstrated by the following figures in table 3.5, indicating the average annual increase in employment in the Study Area in four 5-year-periods.

TABLE 3.5 ANNUAL INCREASE IN EMPLOYMENT

Period	<u>Number of persons</u> (Growth rate 4%)	<u>Number of persons</u> (Growth rate 5%)
1971 - 75	1 600	2 200
1976 - 80	2 200	2 800
1981 - 85	2 400	3 400
1986 - 90	3 000	4 400

Note: The table is based on Table 3.4

A first idea of the significance of these figures can be obtained by a comparison with the Second Malaysia Plan according to which a total number of 600 000 to 700 000 new jobs should be created during the period 1971 - 75. If the Study Area is to play its part in this development proportionate to its population presently about one percent of total Malaysia, then new employment for between 6 000, and 7 000 persons would have to be created during the five years; which is a rate of between 1 200 and 1 400 per year.

It has already been explained in Section 3.4.2, why the development of the Study Area could be higher than the average of the country.

Another problem to consider is whether the growth rate should be constant over the 20 year planning period. It may be found desirable and possible to accelerate development, in the Study Area during the early years of the planning period, more than is indicated in table 3.5 in order to alleviate the problems resulting from land shortage in other parts of Sarawak or because at present there is an undesirable level of unemployment in the country. Alternatively development may be retarded due to the physical difficulties presented by the Area's isolated situation with no road connection to the rest of Sarawak and with only small scale facilities for seaborne outward connections. Retarded development could of course also be planned as a deliberate policy in favour of other areas in Sarawak.

THE STUDY AREA AND ITS DELINEATION INTO PLANNING UNITS

The Study Area extends roughly 130 miles from north to south along a direct line from the Brunei border near Kuala Belait to Bintulu, and it extends 60 miles inland at its widest point, from Kuala Niah to Long Pila on the Batang Baram. The total area is, at around 3.5 million acres, about 37 percent of the total area of the Fourth Division. For planning purposes the Study Area has been divided into 3 planning units and 8 sub-units which are shown in Figure 4.1 and listed below.

Planning Unit I: Baram

Sub-Units: - Marudi

- Long Lama

- Bakong

Planning Unit II: Bintulu

Sub-Units: - Kemena

- Bintulu/Similajau

Planning Unit III: Miri

Sub-Units: - Miri North

- Sibuti

- Niah/Suai

Except for Unit I, the boundaries of the planning units are the same as the existing administrative boundaries. Most often these boundaries follow the natural topographical boundaries; generally the water sheds. However, in some cases the original boundaries of the Study Area were contiguous with rivers; for instance where the Area's northern boundary met the Sungai Tutoh, the boundary followed this river to the Batang Baram and along the Batang Baram to Long Pila. Also the southern boundary followed the Sungai Pandan to the Batang Kemena and then along the river to the coast. In Sarawak rivers are not suitable boundaries for delineating planning areas because, being the main transport lines,

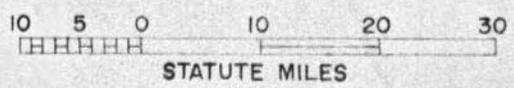
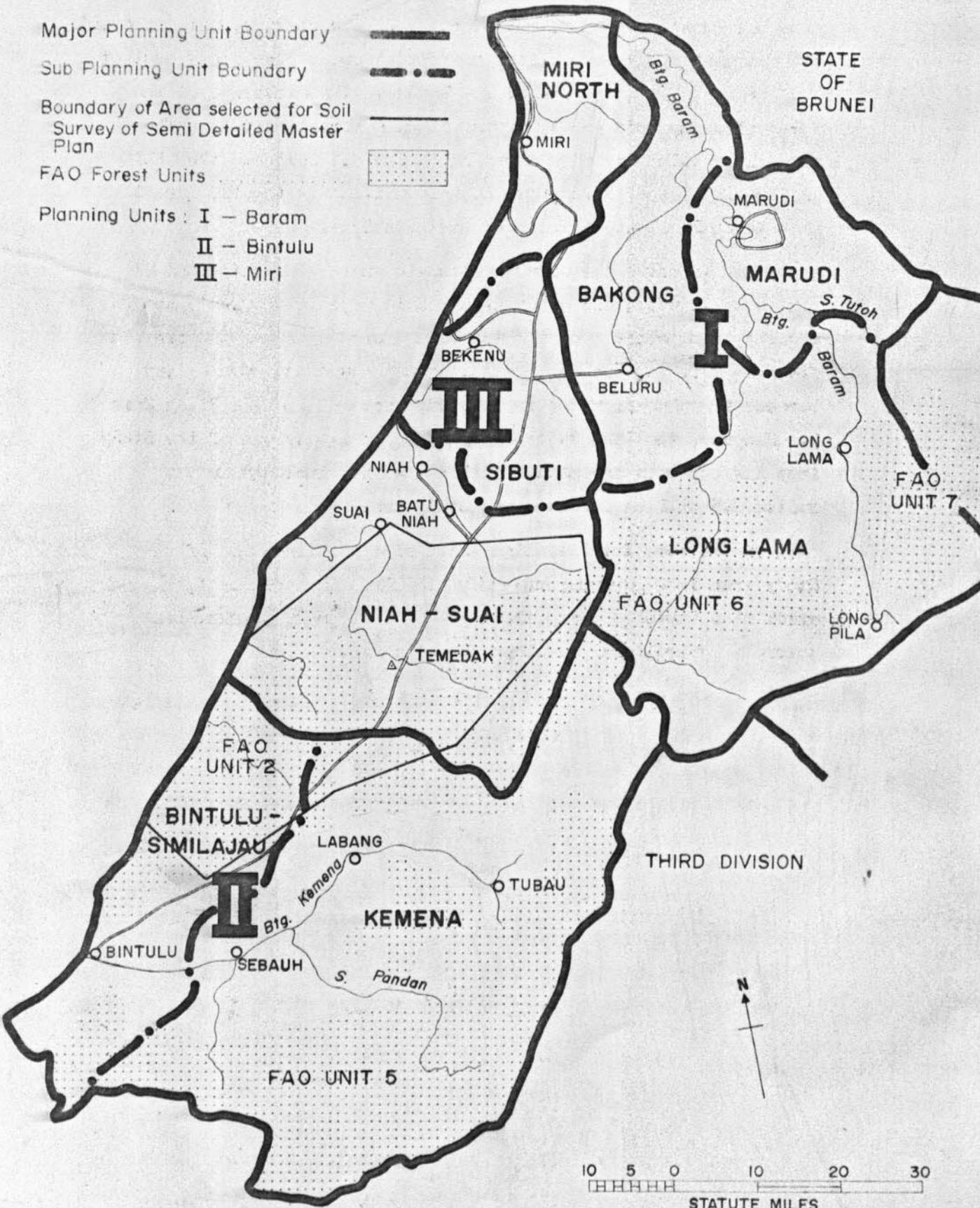
they are the arteries of social and economic activity. The rivers should be within units and not form the borders. For regional planning purposes it has, therefore, been necessary to extend beyond the original Study boundaries to include some of the areas east of the Batang Baram and south of the Kemena. The extension of the Baram planning unit partly covers the FAO Forest Unit 7. (The FAO Units, which are also shown in Figure 4.1 indicate the hill dipterocarp forest which have been identified by the FAO Forest Industries Development Team for exploitation).

To cover the natural economic and social catchment region of Bintulu, the Study Area should include the whole Kemena river system, which necessitates that the boundary of the Bintulu planning unit follows the administrative sub district boundary between Bintulu and Tatau and includes some of the FAO Study Unit 5. However, the land suitability of these extensions of the Study Area has not been assessed, neither are they included in the quoted 3.5 million acres of the Study Area.

A more detailed discussion of the delineation of the Study Area into planning sub-units is given in Appendix I, which also includes a map showing the development blocks with possible agricultural development potential.

PLANNING UNITS AND SUB-UNITS

- Major Planning Unit Boundary 
- Sub Planning Unit Boundary 
- Boundary of Area selected for Soil Survey of Semi Detailed Master Plan 
- FAO Forest Units 
- Planning Units : I - Baram
II - Bintulu
III - Miri



CHAPTER 5

DEVELOPMENT POTENTIALS OF THE PLANNING UNITS

5.1 Planning Unit I: Baram

5.1.1 Existing Situation, Natural Growth and Already Planned Development.

The main aspects of the unit are summarised in Table 5.1 and in Figure 5.1.

Table 5.1 BARAM PLANNING UNIT. Population and Agricultural Potentials

Year	Total Population	Labour Force	Land possibly suitable for Agriculture (acres)		Total acreage of the Planning Unit
			State Land	Encumbered Land	
1970	27 307	10 500	11 000	190 500	1 315 000
1990	47 000	18 000			

Population

Within the total 1970 population of about 27 000 as the largest single community group were Ibans (13 500) with Other Indigenous and Chinese as the two second largest groups (5 to 6 000 each). The only urban settlement in the unit is Marudi with a population of about 3 900. The semi-urban settlement of Long Lama had a population in 1970 of 600.

Labour

More than 9 000 of the total labour force of 10 500 are engaged in primary industries (agriculture, forestry, fishing and mining). About 80 per cent of these are padi planters, i.e. low productivity employment.

Natural Growth

The natural growth (births less deaths) of the population is estimated at 20 000 during the period 1970 to 1990. The corresponding figure for the labour force is 7 500.

Agricultural Potential

In the Zonation Plan roughly 8 000 acres of State Land possibly suitable for agricultural development were identified in block A3 and 3 000 acres in C2. The acreages of Native Customary Land and Titled Land (encumbered land) possibly suitable for agriculture are 69 000 in block A3, 29 500 in block C1 and 92 000 in block C2.

Forestry

The FAO Unit 7, estimated to contain 180 million cubic feet of valuable timber is located east of Long Lama. A proposal has been made by the FAO Forest Team that this resource should be held as a strategic reserve pending the possibility of establishing a timber industry either at Long Lama or Miri. For the FAO Unit 6, south-west of Long Lama the suggestion by the FAO Forest Team is that it should be opened for immediate exploitation for log export. West of Marudi there is a large peat swamp forest which could perhaps be used as the basis for a timber industry based on Marudi. The capacity of this forest has not yet been assessed within this Study.

Cement

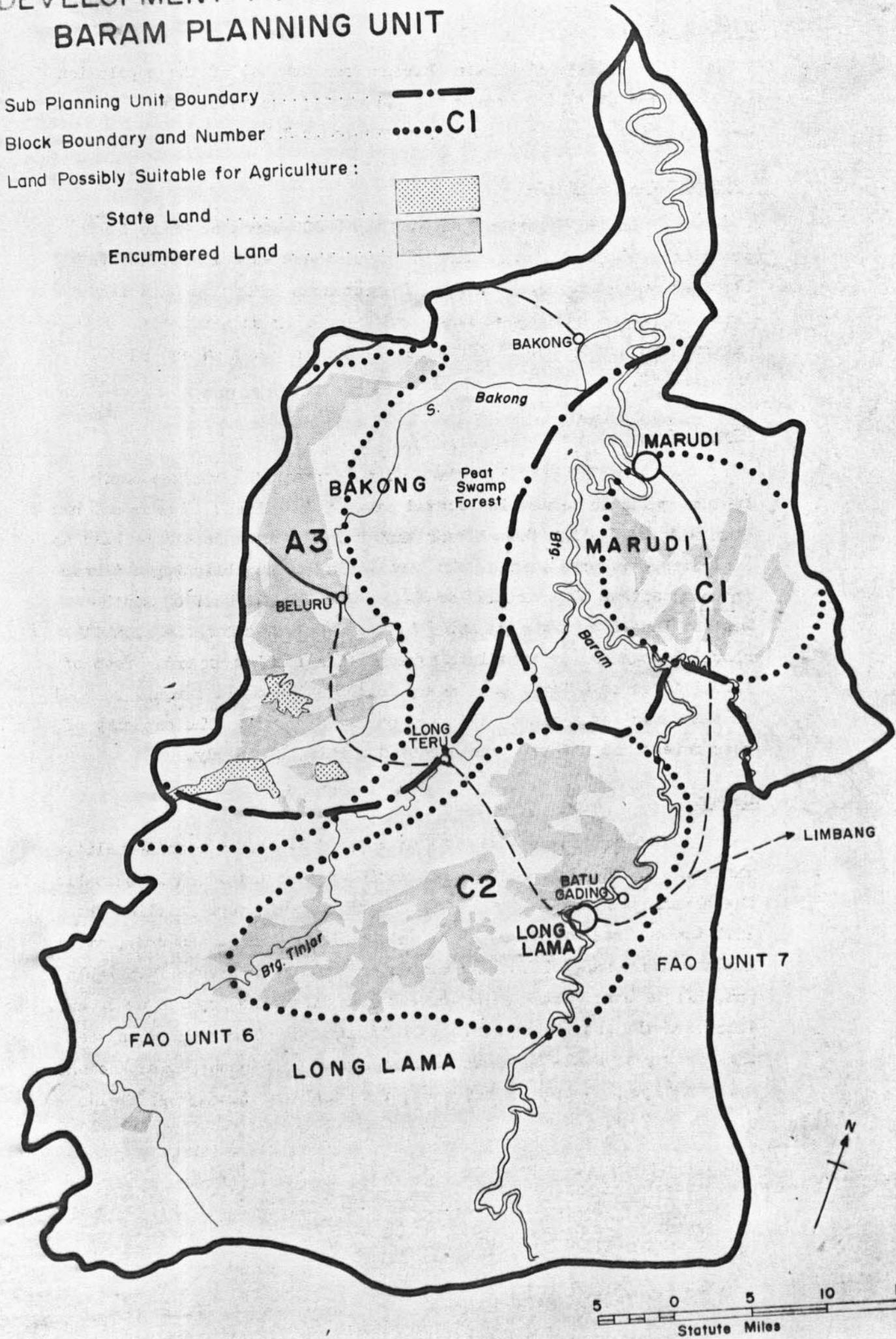
There is more than 21 million tons of excellent cement-quality limestone in the Batu Gading area north of Long Lama. Shale suitable for blending with the limestone for cement manufacture overlies the limestone. Thus cement could be made at Batu Gading. However, at Kuala Baram a mud, ^{with a low silica modulus} (with a low content of silica modulus) is available and this is also suitable for mixing with limestone for making cement. Therefore the possibility exists of transporting limestone down the Baram river to Kuala Baram where it could be manufactured into cement using the gas, at present not used, from the west Lutong oil field.

Why link Block A3 to this development Unit. There is a large Peat swamp to the East of the Block. Production would naturally be evacuated to the West, also development would most probably be started from the SDB scheme

DEVELOPMENT POTENTIALS OF THE BARAM PLANNING UNIT

FIGURE 5.1

- Sub Planning Unit Boundary —●—●—
- Block Boundary and Number CI
- Land Possibly Suitable for Agriculture :
 - State Land [stippled box]
 - Encumbered Land [solid grey box]



unchanged. Marudi would be the only urban centre of any importance and the rivers would remain the main means of communication. The strength of the population drainage would largely depend on what was happening in the rest of the Fourth Division, in Sarawak as a whole and in Brunei.

In order to avoid a large population drainage of the planning unit, development should be canalised to the planning sub-units with the greatest growth potential. These are possibly the sub-units of Bakong and Long Lama as the Marudi sub-unit will not be accessible by road for many years, and as there is a lack of natural resources which are immediately exploitable, except for the peat swamp forest.

Bakong-Long Lama Sub-Units

It is believed that future large scale agricultural development will be based on the accessibility of the area by road. Part of block A3 in the Bakong sub-unit already has road access. A future extension of this road from Beluru to Long Lama via Long Teru will open up land to the south-east in block A3 and in the northern part of block C2; the areas close to the road in these blocks could be used for agricultural development of a modern type. In the Native Customary Land along the road to Beluru oil palm planting, based on the facilities provided in the Lambir Subis Development Scheme, could possibly be undertaken by owner-cultivators on small holdings. In addition to the agricultural potentials in the area, there is the possibility of a more immediate exploitation of the FAO Unit 7 and the north-eastern part of FAO Unit 6.

An agricultural development on Native Customary Land in block A3 could be encouraged by a planned State-run scheme based on two areas of unencumbered land close to the programmed road between Beluru and Long Teru. These areas are big enough for the establishment of, for instance, nucleus estates, which could be the growth poles in the conversion of the surrounding shifting agriculture to a settled one.

In the northern part of block C2 there should be the possibility of establishing strips of agricultural development along the future road from which it should be possible to expand in future. The main crops for development in these areas would be those whose products need only simple processing to prepare them for market, are easily stored, are non-perishable, are of high value and are not bulky. However, the development of the Baram unit should not only be of an agricultural nature but should also include the exploitation of other natural resources, particularly the forests. The FAO Unit 7 is sufficiently large to support an advanced wood processing complex. Such a complex could possibly be established in the late 1970's and could also be fed by the north-eastern part of FAO Unit 6.

The potential for the utilisation of the peat swamp area west of Marudi has not yet been assessed during this Study. Hence it has not been taken into the following considerations.

The direct employment opportunities created by a wood processing complex near Long Lama, in logging, processing and generated indirect employment, could range from 2 600 to 2 800, of which about 1 800 to 2 400 would be inside the Long Lama sub-unit (estimates by FAO). Given a future population/employment ratio of 3:1 this would imply that some 5 400 to 7 200 people inside the sub unit would be affected by the complex. The employment creation outside the sub-unit of 400 to 800 (i.e. 2 600 to 2 800 less 1 800 to 2 400) with a dependant population ranging from 1 200 to 2 400 would, it is believed, take place in Miri.

is this correct?
Should it be Long Lama?

A wood processing complex would form the basis for an urban settlement in Long Lama which would prevent, to some extent, a population drainage out of the sub-unit, such emigration could be expected if no development takes place because the natural growth of the population in the area is estimated at 8 000 up to 1990. Whether it will be possible to stop a future emigration will depend not only on the above mentioned range of employment creation, but also on the size of expansion in existing trade and industries, the opening of other new employment opportunities and on the number of presently unemployed and/or working in a low productivity activities, i.e. hill padi planting. The present

number of actively unemployed, i.e. people wanting and looking for work, in the sub-unit is roughly estimated at 500 to 1 000 people, and the number of workers in low productivity activities at 3 000.

To obtain a balanced geographical development of the Study Area the creation of employment possibilities, not dependent on agriculture in Long Lama would be desirable. However, the wisdom of planning for the whole of the timber processing complex to be in Long Lama is in doubt. To arrange for so large a part of an urban settlement to depend on only one kind of industry could be unwise, especially when this kind of industry may be rather vulnerable to changes in the world market prices. The possibility of splitting up the complex, with part of the pre-processing in Long Lama and the other part in, for instance, Miri should therefore be considered.

?
The existence of a wood processing industry and an urban centre in Long Lama would economically justify building a road from Beluru via Long Teru to Long Lama. This road would give a direct connection to the modern Miri-Bintulu area, and Long Lama would be the nodal point, where the road and river systems link. Such development would cut off some of the traditional trade relations between Marudi and the Upper Baram and Tinjar areas. Thus Long Teru and Long Lama would be in a favourable position as trade centres, with Long Lama as the possible future industrial, trade and administrative centre for the Baram planning unit. Such a development would seem likely to improve conditions also for part of Ulu Baram, maybe with the effect that the population from the more remote areas would prefer to move closer to the new centre.

During the latter part of the perspective plan period, Sarawak will probably need more than the 200 000 tons of cement a year that will be produced by the proposed factory in Kuching. At that time the Batu Gading Limestone, the cheap gas in Miri and the mud in Kuala Baram could be developed to establish a cement factory. If the factory were to be aimed at producing cement for export, i.e. to Sabah, Brunei or Vietnam, then an earlier establishment in the planning period could perhaps be possible.

Why?

5.2 Planning Unit II: Bintulu

5.2.1 Existing Situation, Natural Growth and Already Planned Development

Table 5.2 and Figure 5.2 summarise the main aspects

Table 5.2 Bintulu Planning Unit. Population and Agricultural Potentials

Year	Population	Labour Force	Land Possibly suitable for Agriculture (acres)		Total Acreage of the Planning Unit
			State Land	Encumbered Land	
1970	29 855	11 500	106 000	173 000	991 000
1990	52 000	20 000			

Population

The population in the Bintulu planning unit was about 30 000 in 1970. The major community groups are the Ibans (15 000), which are living mainly in the Kemena sub-unit. The Malays are the second largest group (7 500), most of them living in the Bintulu-Similajau sub-unit. The population of urban Bintulu was 6 200 in 1970 and of semi-urban Sebauh was almost 700 people.

Labour

Almost 9 000 of the labour force are in primary industries compared to 1 600 in non-primary occupations. In the primary group almost 80 per cent are occupied in low productivity activities.

Natural Growth

The natural growth in the population up to 1990 is estimated at 22 000 people, which corresponds to a growth in the labour force of 8 500.

Agricultural Potential

The prospects for agricultural development in this unit are much more promising than in the Baram unit. More than half of the State Land with possible agricultural potential in the unit lies in development blocks A5 and A6, which extend along the Miri-Bintulu road and in the Similajau Forest Reserve. Also, in the Kemena sub-unit, there are 14 000 acres of State Land possibly suitable for agriculture in development block B1, south-east of Labang, and small areas in the northern parts of B2 and A7. In addition there are large areas of Native Customary Land on which it may be possible to carry out agricultural improvement schemes.

Forestry

Some of the largest areas of accessible, unlogged Hill dipterocarp forest in Sarawak are located within, or will be drained through, this planning unit. The forests are located in the FAO Unit 6 (Sawai and Niah-Jelalong Protected Forest) which is estimated to contain 330 mn cubic feet of valuable timber, the Unit 2 (Similajau-Labang Forest Reserve), with 470 mn cubic feet and the Unit 5 (Tubau-Belaga) with about 400 mn cubic feet. FAO tentative proposals are that Unit 2 should be the basis for Sarawak's first major wood processing industry, and that Unit 5 should be the basis for a timber complex in the Tubau-Labang area and Unit 6 should be logged initially for export, to maintain Sarawak's revenues from its forests until such time as the timber complexes are established.

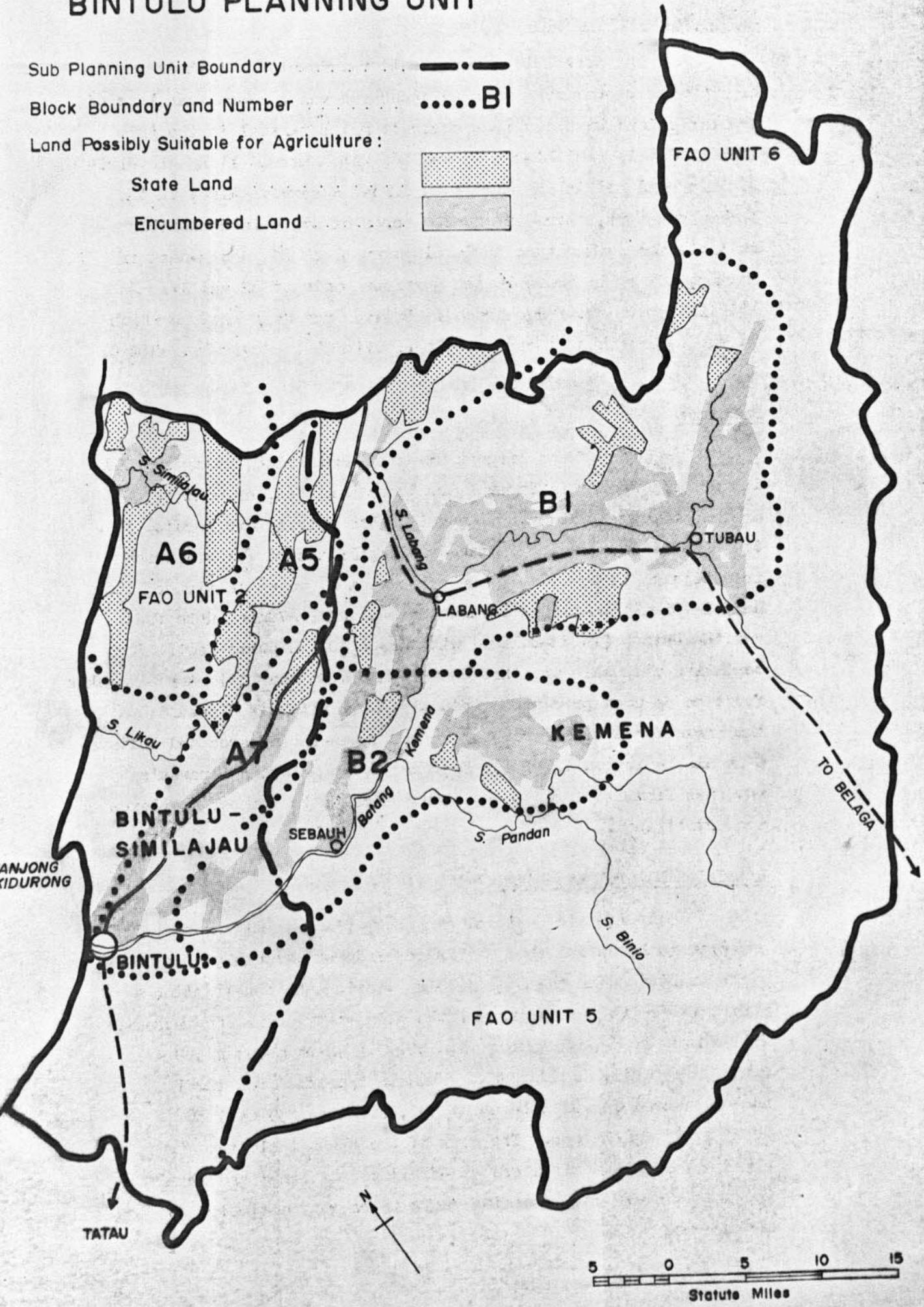
Liquified Natural Gas Plant

A liquified natural gas (LNG) plant is at the moment expected to be established at Tanjong Kidurong, roughly 10 miles north of Bintulu in the late 1970's. During the construction period (three to four years) of the plant the labour requirements will amount to a peak number of 4 000, of which about 1 500 would be recruited in Sarawak. When in operation the total number of employed will be about 300, of which 250 will be local staff and labour. The cost of the plant including pipelines from the off shore gas-field to the plant and from the plant to off shore loading buoys is roughly estimated at US\$ 500 mn.

DEVELOPMENT POTENTIALS OF THE BINTULU PLANNING UNIT

FIGURE 5.2

- Sub Planning Unit Boundary
- Block Boundary and Number BI
- Land Possibly Suitable for Agriculture:
 - State Land
 - Encumbered Land



The plant will need a large supply of fresh and clean water, roads and other infrastructure, the construction and provision of which will create considerable short term and some long term employment opportunities.

Glass Sand

White sand of a quality highly suitable for glass manufacture exists on old raised beaches along the coast south of Tanjong Kidurong and south west of Kuala Likau. This sand together with the gas available so close could possibly be used as the raw material in a glass processing industry.

Ref
Geol. Survey.
Report No 5.
1968

These deposits have in the past been investigated, but development wasn't considered feasible.

Transport

Traditionally the main communication system of the unit is via the waterways, along the Batang Kemena and its tributaries and along the coast. This mode of transport is now being supplemented and partly substituted by air and especially road traffic on the Miri-Bintulu road.

During the Second Malaysia Plan the following roads in the planning unit are to be constructed

- a connecting road from the Miri-Bintulu road to Labang and Tubau;
- a trunk road from Bintulu to Tatau.

The existing airfield in Bintulu is located close to the residential areas, an unsatisfactory site giving little room for expansion. A new site for a future airport is presently being surveyed.

Tanjong Kidurong is mentioned as a possible site for a future deep sea port.

Bintulu

In the report titled "Preliminary Report on the Delineation of Sarawak into Viable Planning Regions" produced by the State Planning Unit, Bintulu town has been pointed out as a possible growth pole for parts of the Third and Fourth Divisions and as a centre for a new Division. The land in Bintulu is suitable for urban development, and at the moment the land development in the area has been frozen.

5.2.2 Development Potentials

The development possibilities in the Bintulu planning unit are much more promising and diversified than the ones in the Baram unit. There are the 106 000 acres of unencumbered land possibly suitable for agriculture, the vast forest resources, the glass sand, the Liquified Natural Gas plant at Tanjong Kidurong and a possible deep sea port or other relevant terminal for seaborne transport.

The Kemena Sub-Unit

The agricultural development possibilities of this sub-unit lie partly in improved cultivation of the Native Customary Land of approximately 135 000 acres and in the development of the 14 000 acres of unencumbered land in the block B1. This area lies between Labang and Tubau, and, after the connecting road to the Miri-Bintulu road has been constructed, this area and the eastern part of FAO Unit 2 together with the northern part of FAO Unit 5 will be easily accessible. To develop the 14 000 acres of State Land to oil palm for example, would give a planted area of about 11 500 acres. Assuming 8 workers per 100 acres this area would create direct employment for 920 workers, which corresponds to a population of 2 800. The multiplier effect of this development on employment and population in derived industries and services could be about 650 workers corresponding to a population of about 1 950, thus giving a total population, directly and indirectly connected with the agricultural development, of 4 750.

Are your figures correct?
I am afraid that
it would be
11,500 acres
of soil
cultivation.

The forest resources in the sub-unit are large enough to form the basis for a wood processing complex with a direct and indirect employment of 4 100 to 4 600, of which 2 500 to 3 600 could be inside the area. Most of the 1 000 to 1 600 job opportunities outside the sub-unit would probably be established in Bintulu.

Whether it is desirable to locate the whole of this complex within the area, or whether a part of it should be established in Bintulu, could be subject to the same kind of reasoning as for the Long Lama complex. The costs involved in the reasoning would be the difference between the total transport costs of transporting refined products to Bintulu if the whole complex were in the sub-unit, and the costs of transporting rough sawn timber to Bintulu if the complex were to be split.

The sum of the direct and indirect employment created by the agricultural development of the 14 000 acres and the wood processing complex would be roughly 1 000 or 5 000 with a dependent total population of 12 000 to 15 000. The natural growth of the present population in the sub-unit is estimated at about 11 000 up to 1990, giving a total future population of around 27 000. Thus, the creation of employment opportunities of this size can absorb from one thousand to four thousand people from the existing unemployment in the sub unit (500 to 1 000), the low productivity employment (6 000), or accommodate settlers from outside. Additional employment could perhaps in time be created, if the shifting cultivators could be converted to a settled agriculture on a proportion of the land presently used, and allowing immigrant people to settle on suitable parts of the abandoned land.

Under any development plan the agricultural population would most probably be dispersed in relatively small villages which would contain some basic services and it would be necessary to create a sub-regional services centre. The most suitable location for this would be together with the timber complex which, because of the future transport facilities would be along Tubau-Labang road. The size of this service centre would be in the range of present day Marudi, i.e. around 4 000 inhabitants.

The Bintulu-Similajau Sub-Unit

The obvious development potentials of this sub-unit are the forest resources, the possible future LNG plant and the possible deep sea port or some other form of sea transport terminal. Additionally there seems to be political preference for appointing Bintulu a growth pole. The present size and attributes of Bintulu town are hardly in themselves of a quality that would attract large scale development.

Most of the State Land possibly suitable for agriculture lies too far from Bintulu to have a major impact on the growth of Bintulu town itself. It is more likely that development of these areas would be in connection with other nearby areas further north and would thus be the hinterland for a local centre in the Niah-Suai sub-unit.

The exploitation of the forest resources in the FAO Units 2 and 6 could support two wood processing complexes, one of which could be located in the above mentioned centre, and the other in Bintulu. The timber complex in Bintulu would directly and indirectly cater for a total population of 13 000 to 14 000. In addition to this would come the induced employment creation in Bintulu from the establishment of wood complexes in Labang and in Niah-Suai. The size of this induced employment would be in the range of 2 000 to 3 200 job opportunities corresponding to a population of 6 000 to 10 000.

A future LNG plant at Tanjong Kidurong would be a rather specialised installation and could not be combined directly with any other industrial development, nor would it contribute, to any extent, to the construction of a deep sea port. However, the gas coming to the plant could provide cheap energy in the area, and could be utilised for local industrial processing. In this sense the plant could give impetus to industrial growth.

Nevertheless the gas would probably be sold at a higher price than that available in Miri, because the alternative market for the gas in the Bintulu area would be as liquified gas to Japan. The Miri gas is at present **not utilised**. Besides, the possibility of using the Tanjong Kidurong gas for glass manufacture and in the wood complexes in Bintulu, there is the possibility of creating a nitrogen **fertiliser** industry. Neither the significance nor size of any those uses have yet been fully considered.

The labour force required during the construction period of the LNG plant would be about 1 500 local workers and contractors together with about 2 500 expatriates. All these would have a multiplier effect on the service employment in the area, as they will require housing for themselves and their families and some of their supplies will be obtained from the local traders. Most of the housing, however, will probably not be of permanent character. The size of this short-term multiplier effect on the local economy in Bintulu could be in the range of 5 000 to 7 000 indirect employment opportunities.

After the construction period the LNG plant employment would drop to around 300, of which 250 would be local staff. This implies a proportionate drop in the indirect employment, which could have an unfortunate effect on the local service sector because the latter might easily have increased its capacity too much during the construction period. Thus, the timing of the construction of an LNG plant and the build up of wood processing industries should be carefully planned and implemented in order to avoid or **minimise** such drops in employment. Thus the impact on the creation of local employment opportunities of the huge investment in a LNG plant would be relatively little, though it might be the first step in an industrialization process.

If Bintulu is chosen as a future centre of a new division, this would lead to increased employment in public services in the town and would have multiplier effects on the service population. The difference in public employment between the present day Miri and Bintulu is about 500. Assuming a general increase in public employment in Sarawak, the number of government employees in a future centre at Bintulu could be the size of the present day Miri. The impact of this increase in public employment would be an indirect employment of another 500 persons and a total population increase, both direct and indirect, of 3 000.

In total the envisaged employment connected with wood processing, the LNG plant and the public employment could easily support an increase in the urban Bintulu-Kidurong population of about 20 000 before 1985.

The rural population in the sub-unit would consist of the people engaged in horticulture around Bintulu and those of possible new agricultural schemes in the southern parts of blocks A5 and A6. The size of such schemes could be of 30 000 to 40 000 acres with a minimum population directly and indirectly connected with the schemes of 10 000 to 14 000. However, because the location of State Land possibly suitable for agriculture is too far north for its development to have any direct influence on the growth of Bintulu the possibilities of developing encumbered land in block A7 and in the western part of block B2 should be considered. Nevertheless the timber and the possible agricultural development within the Bintulu planning unit and its present catchment region will hardly alone justify a deep sea port in Tanjong Kidurong even in conjunction with the LNG plant which will provide its own transport installations.

Thus to make such a port viable other industries or activities must be established within, or in the hinterland, of Bintulu. How far the hinterland of such a port would extend has yet to be considered. Furthermore, no survey has been undertaken around Tanjong Kidurong to establish whether a port could be located there or the probable cost of it. In this connection it seems essential to consider the entire port and sea transport system of Sarawak to find the type and location of future ports.

The considerations must include type and quantity of goods exported from and imported into the country, and the alternative of the possibility of establishing a feeder service to a common deep sea port in Borneo, Singapore or Johore Bahru.

The urban development of Bintulu offers some intricate and specific problems. The range of possible future developments of the town is quite wide, because some of the important single elements in the development pattern are still very uncertain:

- the establishment of an LNG plant has not yet been finally decided,
- the possible number and size of derived industries is not easily established,
- the question: if or when a deep sea port should be built, is open,
- this also leaves open the question of the optimal location of timber plants, i.e. whether they shall be located near Kemena and Bintulu or in the Tanjong Kidurong area.

A port, LNG and timber plant development in the Tanjong Kidurong area would necessitate considerable investments in urban facilities in this area, including roads, telecommunications, hospitals, residential housing etc. At the same time old Bintulu must maintain and expand its function as a trade and service centre for its hinterland and probably provide land for various manufacturing industries.

The problem will be how to unite the development of these two urban areas, with a distance between them of about 10 miles, so that the future town will emerge as one important centre and growth pole. To ensure this will call for careful town planning and especially for administrative powers to guide and direct this development. The town planning will meet two challenges, one from the uncertainty of scale of development, and the other from the fact that development will be taking place in two areas with considerable distance between them.

5.3 Planning Unit III: Miri

5.3.1 Existing Situation, Natural Growth and Already Planned Development

The development potentials of the planning unit and its sub units are indicated in Figure 5.3 and important aspects are summarised in Table 5.3.

Table 5.3 Miri Planning Unit. Population and Agricultural Potentials

Year	Population	Labour Force	Land possibly suitable for Agriculture (acres)		Total Acreage of the Planning Unit
			State Land	Encumbered Land	
1970	59 277	32 000	244 000	138 000	1 246 500
1990	103 000	55 000			

Population

In 1970 the population in Miri district was 59 000. The largest single ethnic group as the Chinese (23 000) with Malay and Ibans as the two second largest groups (about 13 000 each). The urban area of Miri-Lutong had at the census time a population of about 27 000.

Labour

The labour force in the unit is distributed equally between primary and non-primary industries, which is quite different from the distribution in the other units. About 6 600 persons are occupied in low productivity activities. The natural population growth up to 1990 is estimated at 44 000 with a corresponding increase in the labour force of 23 000.

DEVELOPMENT POTENTIALS OF THE MIRI PLANNING UNIT

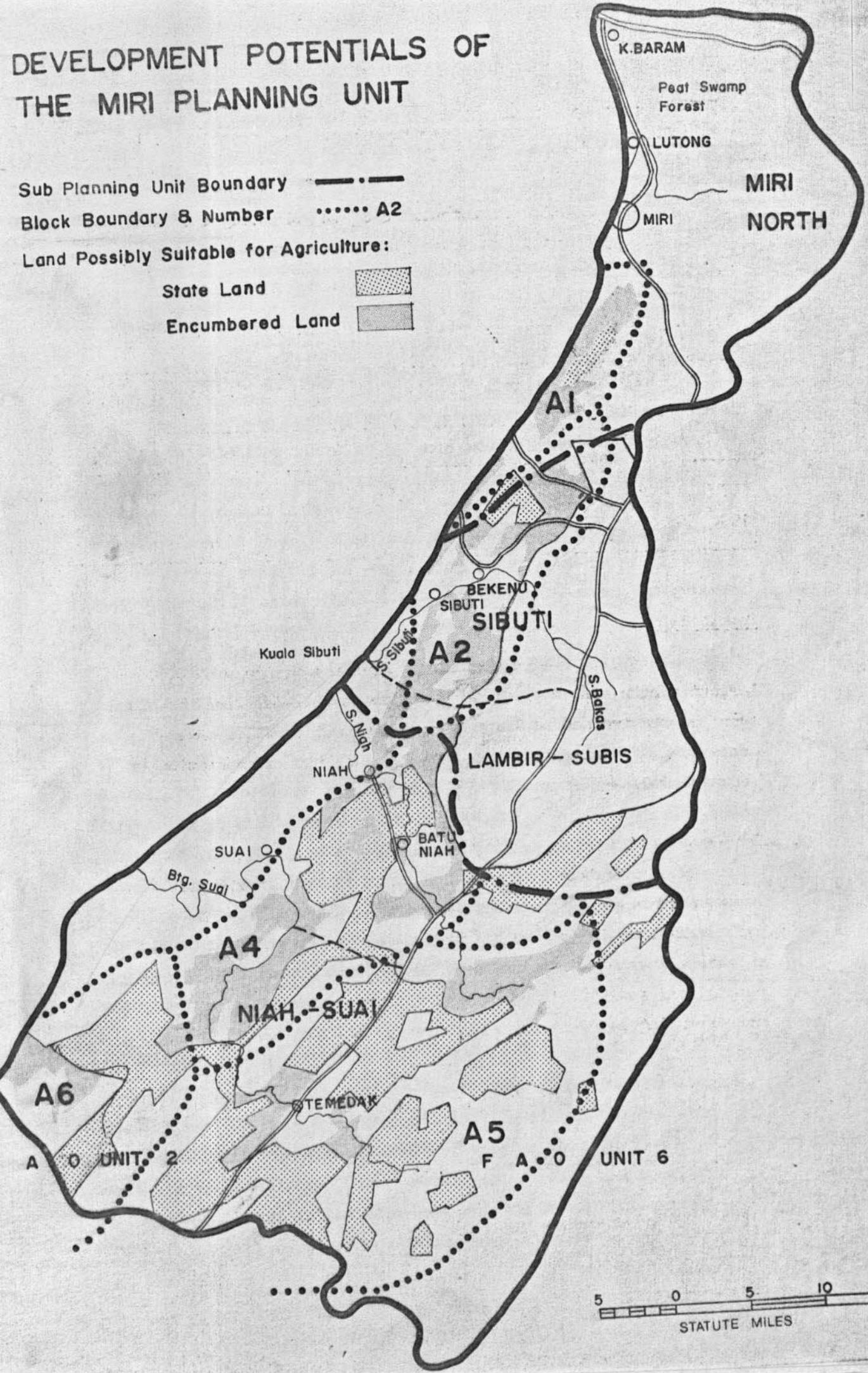
Sub Planning Unit Boundary ————

Block Boundary & Number A2

Land Possibly Suitable for Agriculture:

State Land [stippled box]

Encumbered Land [shaded box]



Agricultural Potentials

Almost 70 per cent of the total acreage of State Land with possible agricultural potential in the Study Area has been identified in the Miri planning unit. The distribution of this land in the development blocks is as follows (see figure 5.3):

A1 : 5 500 acres

A2 : 12 000 acres (some areas in Lambir-Subis are included)

A4, A5 and A6: 226 500 acres

The main agricultural development in the planning unit during the next five years is already taking place within the Lambir-Subis area. The already planned development directly connected with the Commonwealth Development Corporation (CDC) and Sarawak Land Development Board (SLDB) oil palm schemes will produce about 60 000 tons of palm oil per year, when in full production. This development will cater for a total population of about 23 000, who will be settled by 1975 - 76.

The location of the proposed oil palm factory has not been finalised nor has the method of loading the palm oil into the sea-going ships. The SLDB factory is expected to be either at mile 37 from Miri on the Miri-Dintulu road or at Kuala Sibuti. The two most likely locations for the palm oil bulking installation are Miri or Kuala Sibuti and the oil will either be pumped to the ships through a long pipeline or taken to the ships in specially designed barges. Important factors to be considered with regard to the location of the factory are transport costs of the fresh fruit bunches to the factory and the oil to the bulking installation, supply of fresh water, disposal of effluent and the impact on settlements in the area.

Forestry

The northern part of the FAO Unit 2 and the western part of the FAO Unit 6 (Niah-Jelalong) lie within the Niah-Suai sub unit. Other workable forests of varying quality in the planning unit are the peat swamp forest north east of Miri and some hill dipterocarp forest in the Niah-Suai and the Sibuti sub-units. Much of the hill dipterocarp forests have already been logged

though there is some valuable timber still remaining, for instance the Bakas forest contains about 2 tons of valuable logs per acre. The possible value of the peat forest has not yet been assessed within this Study.

Transport

The transport system of the planning unit is, compared to the other units, quite well developed, especially the roads. Externally the unit is connected by road, water and air, the latter being important for passenger traffic to and from Miri; most goods traffic is by sea carried in relatively small coasters. Recent improvements for the sea going traffic are the new 800 gross registered tons coastal vessels going directly between Miri wharf and Singapore with a loading capacity of around 500 tons of cargo.

During the Second Malaysia Plan feeder roads will have a high priority. Possible locations of feeder roads in the unit are

- from the mile 37 on the Miri-Bintulu road to Kuala Sibuti;
- from the northern part of A5 on the Miri-Bintulu road and into the southern part of A4.

The road to Kuala Sibuti will, however, depend on the location of the SLDB oil palm factory and the evacuation of palm oil. The cost of this road is roughly estimated by the FWD at M\$2 to 3 mn depending on whether it will be surfaced or not. If the bulking installation is located at Miri surfacing of the Miri-Bintulu road as far as the factory will probably be necessary and economically feasible.

An extension of the Miri airport has been planned, so that Boeing 737 and corresponding aircraft types will be able to use it.

Miri-Lutong Urban Area

The existence of this built-up area with about 27 000 persons in 1970 will be an important factor in the development of the planning unit and the Study Area. The population has increased during the period 1960 to 1970 by 5.2 per cent per year. Today this area represents a considerable concentration of industry, transport, public and private services which will, most likely, continue to grow rapidly in the future.

A town plan for the area north of the city centre has been prepared by the Department of Land and Survey. According to this plan the old Malay houses along the Miri river will be cleared and a new Malay Kampong will be built.

5.3.2 Development Potentials

The development potentials of this planning unit lie in the creation of basic industrial employment connected with oil, gas and timber in the Miri North sub-unit, the agricultural development of the Lambir-Subis in the Sibuti sub-unit, and the potentials for agricultural and forest development in the Niah-Suai sub-unit. The priorities for development of the various areas, will be influenced by Miri as a centre offering private and public services of considerable quality. The town is already a growth pole and a magnet for further development. Any additional population resulting from any development with good access to this town will not only enjoy its services, but will also contribute to a further increase and refinement of the service level of the town. Therefore, it appears that Miri will be the leading service centre of the Study Area for a considerable time regardless of any opposing effects of other development requiring new towns or the strengthening of existing ones.

Miri-North Sub-Unit

The oil and gas potentials around Miri will give rise to new employment either in connection with the expansion of existing activities off-shore or with derived industries using the cheap gas in the area.

A wood processing complex, or part of one, (as was explained in Section 5.1) based on the exploitation of the FAO Unit 7, could be located in Miri. Other sources of logs could be from the Niah-Jelalong Unit and the peat swamp area north-east of Miri.

The growing urban population in Miri could be the basis for market gardening along the Miri-Bintulu road and along the coast south of Miri.

If the population growth of the Miri-North sub-unit continues at roughly the same rate as in the last 10 years, the population will rise from about the present 37 000 to about 100 000 in 1990. This will imply a net in-migration of 35 000. The urban population of the sub-unit could then amount to some 60 to 70 000. Most of the future population growth will be in the urban area of Miri-Lutung and in the horticulture and livestock producing population to support these people, therefore in the future there could be conflicts in the demand for land for urban development and for market gardening. A careful long range and short range town planning of Miri must be provided to assure its amenities and good functioning as a modern urban centre.

Sibuti Sub-Unit

Certain increases in the basic employment outside the urban Miri will take place within the Lambir-Subis Area. The agricultural population connected to the CDC and SLDB schemes will mostly be wage-earners, which implies that their way of living and their demand for goods will be different from the traditional agricultural population. Their incomes will be mostly in cash and not in kind, and, similar to an urban population, they will buy goods and services from other people.

This will only absorb very small number of people. I would prefer not to over emphasize the point. 100 acres would be sufficient to serve Miri. The Bahau Area is also a possibility.

The settlers on SLDB - schemes would not be wage-earners all the time.

The preliminary proposal for settlements in the Lambir-Subis Area is to locate the population in about 8 to 10 villages of about 3 000 persons each and one larger urban centre. Each village would have facilities to supply day to day needs.

The development of the CDC and SLDB schemes with a future population of from 25 to 30 thousand people will require a local service centre of about the same size as today's Bintulu, i.e. around 4 000 inhabitants. The supply of service could not easily be achieved by expanding the existing service centres of Bekenu or Batu Niah because they are too far away. Hence, the best solution would seem to be the creation of a new centre along the Miri-Bintulu road, somewhere near where the road from Beluru meets it.

Niah-Suai Sub-Unit

This sub-unit contains in block A5 probably the most promising land for agricultural development in the whole Study Area. If 30 to 40 000 gross acres of agricultural development could take place here the area might cater for about five to seven thousand people with a livelihood in agriculture. An additional population of the same size would be required to fulfill the employment opportunities derived from the primary and secondary processing industries as well as the demand for services of the total population. This would give a total new population in the area of about 10 to 14 thousand by 1980/85. Such a population would require a service centre of nearly the size of the present day Bintulu, in addition to a few scattered local centres. The main service centre besides requiring a central location in relation to the distribution of the population, would also need a reliable supply of fresh water, power, suitable building ground, etc. A possible site for such a future centre is where the Miri-Bintulu road crosses the Batang Suai. This location is within 10 miles of most of the State Land possibly suitable for agricultural development in block A5 and is a suitable junction for a road to the large areas of possible agricultural development within Similajau Forest Reserve. The orientation of the population in this area for a service centre of higher order will probably be towards Bintulu.

Rather a bold statement at this stage of the game.

The Niah-Jelalong forest would, if used exclusively for log export, be drained by the Niah river. If used for wood processing industries, it could either be the basis for one complex in connection with the above mentioned agricultural centre in A5 or be a support to the supply of complexes in Bintulu and Miri. The total direct and indirect employment creation would be, for the whole planning unit, a maximum of 2 500 to 3 600, which corresponds to a population of 7 500 to 11 000.

By and large, the Miri planning unit is envisaged as a rapidly growing unit based on industrial and service development in the Miri sub-unit and modern agricultural development along the Miri-Bintulu road. Whether the Niah-Suai sub-unit will also experience in-migration and high population growth will depend on whether the Niah-Jelalong forest is used as a basis for a wood processing complex in the sub-unit and on how much of the planned agricultural development will be located in this sub-unit. The latter will in turn depend on whether the strategy will be to concentrate or to disperse agricultural development.

On the basis of these development possibilities the population in the planning unit could rise to between 140 and 160 thousand by 1990, which would require an in-migration of about 40 to 60 thousand people. The settlement pattern associated with such a population would be a large urban centre, Miri, and possibly two sub-regional centres along the Miri-Bintulu road, which will be the central feature in a herring bone pattern road system.

Appendix I

DELINEATION OF THE STUDY AREA INTO PLANNING SUB UNITS

1. General

The division of main planning units into sub-units has been based on;

- (a) the delineation of blocks with possible agricultural development potential which were identified in the Zonation Plan; (See Figure I.1.)
- (b) the boundaries of the 1970 Census Circles and administrative sub districts;
- (c) existing and possible future communication systems and settlements.

The delineation of the development blocks was based on physical criteria and on accessibility. Thus the blocks can be viewed as sub-regional agricultural development units. The most accessible blocks along the coast and along the Miri-Bintulu road are now numbered from A1 to A7. The C and B blocks in the Baram and Bintulu planning units are the more remote blocks, except for the north-western part of block B1 which is close to the Miri-Bintulu road. The numbering of the blocks in this Figure does not follow those used in the Zonation Plan as it has been found necessary to make some changes.

2. Baram Planning Unit (Unit I in Figure 4.1)

This unit has been divided into three sub-units:

- Marudi
- Long Lama
- Bakong

The reasons for the delineation of the Baram-Tinjar area into two sub-units - Marudi and Long Lama - are:

- (a) findings of the Zonation Plan, where two separate development blocks have been identified C1 and C2;
- (b) possible future orientation of the economic and social activity in these blocks. C1 towards Marudi, and C2 towards Beluru and Miri.

The orientation of Marudi will probably remain as today, namely along the Batang Baram; the Long Lama sub-unit, however, may in the future, be connected by road to the Miri-Bintulu road system. This will give a westward orientation towards Long Teru, Beluru and Miri. The boundaries of both sub-units follow Census Circle boundaries, except for the southern part of the Long Lama unit which is an arbitrary line south of Long Pila.

The Bakong sub-unit, which lies within the Baram administrative district, will be more orientated towards Miri than towards the Baram planning unit because of a planned future road connection to Miri. Only the north-eastern part of the sub-unit, running along the Batang Baram, will possibly continue to have a stronger interaction with Marudi than with Miri. The sub unit is comprised of the whole of the Census Circles 01 and 02; it also includes the development block A3.

3. Bintulu Planning Unit (Unit II in Figure 4.1)

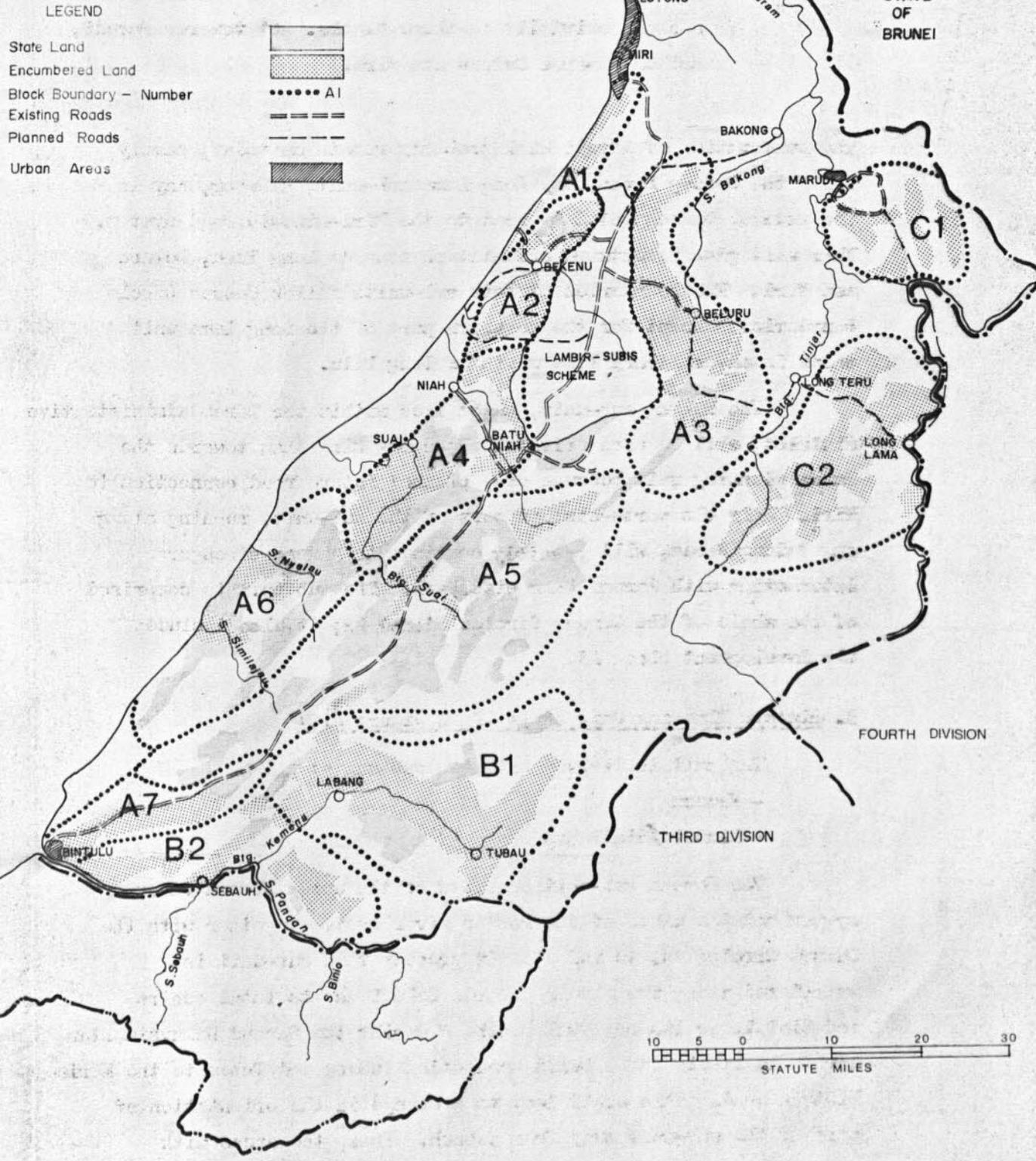
The unit is divided into two sub-units:

- Kemena
- Bintulu/Similajau

The Kemena sub-unit consists of the upper Kemena river system and the whole of the Pandan river system together with the Census Circles 09, 10 and 12. At present this sub-unit is orientated along the rivers towards Sebauh as its local centre and Bintulu as its regional centre. During the Second Malaysia Plan a road is likely to be built connecting Labang and Tubau to the Miri-Bintulu road. This could lead to a change in the orientation of part of the sub-unit away from Sebauh. Thus, the areas with agricultural development potentials in the sub-unit have been separated into two blocks, B1, and B2. Included in the sub-unit are parts of the FAO Study Units 2, 5 and 6.

FIGURE I-1

AREAS WITH POSSIBLE AGRICULTURAL DEVELOPMENT POTENTIAL



The borders of the Bintulu/Similajau sub-unit follow those of the Bintulu administrative sub district and cover the Census Circles 01, 02 and 03. This sub-unit is the nearby hinterland of the Bintulu service centre which is fed by the main communication arteries of the Kemena river, the coastal line and the Miri-Bintulu road. **Natural** resources in the sub unit are: the development block A7, the southern parts of blocks A5 and A6, a large part of the FAO Study Unit 2 and a small part of FAO Unit 5.

The economic and social catchment region of Bintulu really includes the whole of the Kemena and Pandan river systems as well as the Tatau river system. The latter river system, which is not included in this Study, depends on Tatau and Kuala Tatau for the supply of local services but upon Bintulu as a regional private and public service centre. The future influence of Bintulu as a regional service centre will, to some extent, depend on whether the construction of the Pan-Sarawak main road starts from Bintulu or from Sibiu. Important physical resources in these southern areas are the forests, especially the FAO Unit 5 which, it is believed, contains large areas of land with possible agricultural development potential. The Tatau river system contains the Census Circles 04, 05, 06, 07 and 08.

4. Miri Planning Unit (Unit III in Figure 4.1)

The unit has been divided into three sub-units:

- Miri North
- Sibuti
- Niah/Suai

The administrative sub district of Miri and the Miri North planning sub-unit are the same. The area covers the Census Circles 01 to 05 and contains development block A1, also the Miri/Lutong urban areas and its nearby hinterland. The southern part of the sub-unit, however, receives its local services from the Bekenu semi-urban centre, which is in the Sibuti sub-unit.

The Sibuti sub-unit covers the Lambir-Subis Development Area and development block A2. The Census Circles included in it are 06, 07, 08 and a part of 10. Within Census Circle 10 the boundary of the sub-unit follows the block boundary between blocks A2 and A4, as this seems to be a more natural, physical, social and economic boundary than that of the Census Circle 10.

The delineation of the boundary between the Sibuti and the Niah-Suai sub-units has been difficult because the development and the settlements along the Miri-Bintulu road are in continuous growth southwards. The Niah/Batu Niah settlements, which have been included in the Niah/Suai sub-unit, could have been included in the Sibuti sub-unit, but the growing population in the Sibuti sub-unit will probably not depend on Niah/Batu Niah for their supply of services but rather on a centre in the Lambir Subis Area, whereas future development in block A4 will probably depend for services on Niah/Batu Niah.

The Niah/Suai sub-unit consists of the Census Circles 09, 11, 12 and the remaining part of 10. The unit includes the development block A4, and parts of blocks A5 and A6. Blocks A5 and A6 are the proposed areas for commencing the soil survey work for the Semi-Detailed Master Plan Area. In this sub-unit valuable forests are found in the FAO Units 2 and 6.

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MIRI - BINTULU REGIONAL PLANNING STUDY

ASSOCIATION PAPER

LAND USE : FORESTRY OR AGRICULTURE

— an economic approach —

LAND USE: FORESTRY OR AGRICULTURE

- an economic approach -

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assuming that the acre is part of a sufficiently large unit to meet the requirement of economies of scale throughout the production process.

The two alternatives are:-

1.1 Forestry

PHASE 1 - Logging in the relevant area is carried out in a way that intensive forestry can be realised. This is assumed to decrease the production cycle to 28 years. Time: 1 year.

PHASE 1 in year 1.

PHASE 2 - Logging as assumed in PHASE 1. Time: 1 year.

PHASE 2 in year 28.

Phase 3 in year 70 ?

1.2 Agriculture

PHASE 1 - Clearing of forest in such a way that the best possible use is made of the timber. PHASE 1 in years 1 to 3.

PHASE 2 - Final clearing of remnant forest and planting of oil palms.

PHASE 2 in years 4 to 6.

PHASE 3 - Production period during which oil mills and other necessary facilities are constructed.

PHASE 3 in years 7 to 28.

replanting of oil palm after 15-20 years.

2. DETAILS OF THE ALTERNATIVES

2.1 Forestry

The example assumes that the output of timber from the first felling (PHASE 1) in both the forestry and agricultural alternatives will be the same and two levels of yield are assumed, namely 10 tons and 15 tons per acre. Costs and revenues are calculated per ton (one Hoppus ton = 50 cubic feet Hoppus). However, the logging costs for the forestry and agricultural alternatives are based on different assumptions;

(a) For the forestry alternative, logging is carried out in such a way that natural regeneration for permanent forestry is ensured.

(b) For the agricultural alternative, logging is carried out with no attention to regeneration.

The costs of the silvicultural operation necessary to obtain a 25 to 30 year forestry rotation are uncertain but are estimated to be low and they have not been included in the calculations. The expected low net cost of these forestation operations, which are expected to include poisoning of

unexploitable tree species and manual thinning, is a consequence of the assumption that the thinning will result in considerable extraction of poles the sale of which would cover the cost of that operation. Poisoning is estimated to cost only \$5 to \$10 per acre. Thus the differences between the costs of the one-time logging operation for the agricultural alternative and logging for permanent forestry are the increased operation costs in the latter case for more careful felling and skidding, and a more elaborate road network.

Table 1. The estimated logging costs per ton based on 10 to 15 tons per acre

Item	Logging system (a) \$ per ton	Logging system (b) \$ per ton
Felling	1.25	1.00
Skidding	11.50	9.25
Debarking	0.75	0.75
Loading	0.75	0.75
Hauling	3.25	3.25
Dumping	0.25	0.25
Roads ⁽¹⁾	18.00	14.00
Overheads ⁽²⁾	12.25	12.25
Totals	48.00	41.50
20% administration and contingencies	9.50	8.25
Total costs per ton	57.50	49.75
	- say \$58.00	- say \$50.00

Note:

- (1) The road costs are based on the following standards and costs:-
 - main roads: 14 feet width, 1/1,800 mile per acre, \$30,000 per mile
 - branch roads: 12 feet width, 1/150 mile per acre, \$17,000 per mile
 spur roads: (a) 10 feet width, 1/200 mile per acre, \$11,000 per mile
 (b) 10 feet width, 1/600 mile per acre, \$11,000 per mile.
 Road and equipment maintenance costs and their assumed interest are also included.
- (2) Overheads costs cover camp salaries, housing, workshop, camp equipment, capital charges, training and opening-up costs.
 The estimated extra transport costs for export logs are \$10 per ton.

As an analogy to the palm oil extraction mill the forestry alternative can be extended to include a sawmill to process the unexportable logs. The sawmill is considered to be of size that makes its operation economical. This means that its capacity might exceed the possible output from the example area. The sawmill is consequently based on the production in an extended area.

Table 2. Estimated costs for the sawmill

	\$ per ton sawn timber
Direct production costs including maintenance	10.75
Depreciation, interest and insurance (assuming a mill life of 20 years)	8.25
Log cost ⁽¹⁾	102.00
Transport	10.00
Personnel salaries and contingencies (5%)	7.00
Total cost	\$138.00

Note:

- (1) The log cost per ton of sawn timber is calculated on the basis of the production cost price of logs plus 5 per cent extra cost that is timber-ton-price = $\frac{58}{0.6} 1.05 = \$102.00$ per ton. The conversion factor logs/sawn timber is estimated at 1/0.6.
- The logs for exports are calculated to fetch an average price of \$100 a ton while the price of the mill logs is estimated at \$58 per ton.

The output and net revenue from one felling in the logged area would, according to logging system (a), be shown in Table 3.

Table 3. Output and Net Revenue, Logging System (a)

- for 15 tons per acre -	
	DOLLARS
<u>Export logs</u>	
13.5 tons @ \$100	1,350
<u>less</u> transport	<u>135</u>
production value	1,215
<u>Sawmill logs</u>	
1.5 tons @ \$58 (costs)	87
1.5 tons @ \$12.5 (production)	<u>18</u>
	<u>105</u>
total production value	1,320
<u>less</u> logging costs	
15 tons @ \$58	<u>870</u>
Net revenue	<u>450</u> =====
- for 10 tons per acre -	
<u>Export logs</u>	
9.0 tons @ \$100	900
<u>less</u> transport	<u>90</u>
production value	810
<u>Sawmill logs</u>	
1.0 ton @ \$58 (costs)	58
1.0 ton @ \$12.5 (production)	<u>12</u>
	<u>70</u>
total production value	880
<u>less</u> logging costs	
10 tons @ \$58	<u>580</u>
Net revenue	<u>300</u> =====

The output and net revenue from one felling in the logged area, according to logging system (b), is shown in Table 4.

Table 4. Output and Net Revenue, Logging System (b)

- for 15 tons per acre -	
	DOLLARS
<u>Export logs</u>	
13.5 tons @ \$100	1,350
<u>less</u> transport	<u>135</u>
production value	1,215
 <u>Sawmill logs</u>	
1.5 tons @ \$58	<u>87</u>
total production value	1,302
<u>less</u> logging costs	
15.0 tons @ \$50	<u>750</u>
Net revenue	<u>552</u>
	say \$550 <u>=====</u>
 - for 10 tons per acre -	
<u>Export logs</u>	
9.0 tons @ \$100	900
<u>less</u> transport	<u>90</u>
production value	810
 <u>Sawmill logs</u>	
1.0 ton @ \$58	<u>58</u>
total production value	868
<u>less</u> logging costs	
10.0 tons @ \$50	<u>500</u>
Net revenue	<u>368</u>
	say \$370 <u>=====</u>

2.2 Agriculture

The oil palm alternative is based on studies carried out by the Consultants. Approximately 20,000 acres of suitable land is assumed to be planted in the model example to justify an oil extraction mill. The actual schemes are naturally carried out according to specific phasing programmes. The present paper is more concerned with the theoretical side of the problem and the adopted phasing is, therefore, used to simplify the calculation of investments, costs and revenues.

The first phase of the agricultural alternative is a logging phase in which all usable timber is taken out of the future palm oil area. The logging operation is probably most economically carried through as a separate enterprise, thus it is assumed that the entire area will be logged before the agricultural development is started. Consequently the net logging revenue is calculated as occurring in the first year of the logging operation while PHASE 2 costs are assumed to begin in year 4. PHASE 2 starts after the usable timber has been extracted and includes felling, burning, pruning, stacking and reburning the remnant forest. The costs per acre assumed are as follows:

	\$
felling	70.00
burning	5.00
pruning, stacking, reburning	75.00
	<hr/>
	\$150.00
	<hr/>

For the required road network it has been assumed that by careful initial planning, parts of the logging road network could be used for agricultural purposes. Thus the cost of the roads are based on two stages of construction. The first stage includes extending and improving parts of the existing logging road system into 12 feet-wide roads. In the second stage, which is assumed to take place just before the commercial harvesting starts, the road system is further expanded and improved into primary and secondary roads as well as harvesting paths. For this reason the costs for primary and secondary road construction, used in this example have been reduced by 20 and 40 per cent respectively from the actual costs experienced by the estates studied. The road specifications and construction costs assumed are:-

- primary roads 18 to 20 feet wide, 1/800 mile per acre; \$50 per acre x 0.80 = \$40 per acre

- secondary roads 12 feet wide, 1/100 mile per acre; \$250 per acre x
0.60 = \$150 per acre

- harvesting paths, 1/8 mile per acre, \$30 per acre.

Road maintenance costs are, to a certain extent, included in construction costs but an overall road maintenance charge of \$16 per acre is included in operation costs.

Other initial field costs are:-

	\$ per acre
Draining	15.00
Lining	10.00
Platforming	22.00
Holing	13.00
Nursery production of plants	114.00
Planting	34.00
Cover crop establishment	55.00
Planting fertiliser	10.00
Cover spray	17.00
Miscellaneous (5 per cent)	12.00
Maintenance until commencement of harvesting	330.00
Overhead costs up to commencement of harvesting:-	
Headquarters and settlement	200.00
Processing facilities	440.00
Administration and management	90.00
Contingencies (10 per cent)	130.00
Annual operation costs during production:-	
Maintenance materials	16.00
Fertilising materials	100.00
Disease control	3.00
Labour (including harvesting)	92.00
Internal transport	21.00
Processing	45.00
Forwarding and storage	35.00
Administration	31.00

Until production year 11 an average yield of 8.5 tons of fresh fruit bunches (FFB) per acre is assumed. From year 11 to 25 a one per cent annual decrease in FFB output is expected. The oil quantity extracted from

the FFB increases from 16 per cent in the fourth year to 20 per cent by the eighth year. Kernel production has been taken as $4\frac{1}{2}$ per cent of FFB.

The value of the production per acre is based on the following assumed palm oil and kernel prices; (cf. Sole, FA 1972):-

	Price assumption I \$	Price assumption II \$
palm oil per ton	430.00	390.00
kernel per ton	370.00	370.00

Experiences from existing schemes in Sarawak indicate that only about 85 per cent of the land is actually planted to oil palm. The remaining 15 per cent is, partly occupied by roads, drains, buildings etc. and partly found unsuitable for planting. A 5 per cent 'road and -others' reduction factor is assumed for similar reasons for forestry.

3. CALCULATIONS

Using the above mentioned data the Net Present Values are calculated for all costs and revenues in the years from 1 to 28. The Net Present Value (NPV) is a measure in which the difference between the present value of benefits (revenue) and the present value of costs is evaluated. This means that all costs and benefits are discounted to a zero-year usually the one when the first investment is made.

The rate of interest used for the discounting (the discount factor) is (cf. Iuul, M 1972a, 1972b) normally the estimated opportunity cost-of-capital, in this instance 10 per cent. But to illustrate the sensitivity of the investment towards changes in the rate of interest two more alternative rates have been selected, namely 7 per cent and 15 per cent per annum.

3.1 Forestry

The net revenue of the logging phase in the forestry example base on logging system (a) is discounted to year zero and the figures in Table 5 represent consequently the NPV of the revenue in this example.

Table 5. Net Present Value of Logging Revenue

	10 tons per acre	15 tons per acre
<u>PHASE 1</u>	\$	\$
at 7 per cent	285	425
at 10 per cent	285	425
at 15 per cent	285	425
<u>PHASE 2</u>		
at 7 per cent	37	56
at 10 per cent	15	22
at 15 per cent	3	4
<u>TOTAL NPV</u>		
at 7 per cent	322	481
at 10 per cent	300	447
at 15 per cent	288	429

3.2 Agriculture

The NPV of the oil palm scheme (per acre) is calculated to be:-

	Price assumption I ₹	Price assumption II ₹
<u>PHASE 1</u>		
at 7 to 15 per cent 10 ton per acre	350	350
at 7 to 15 per cent 15 ton per acre	525	525
<u>PHASE 2-3</u>		
at 7 per cent	1,329	1,111
at 10 per cent	542	415
at 15 per cent	1	-55
<u>TOTAL NPV</u>		
(10 tons per acre logs)		
at 7 per cent	1,679	1,461
at 10 per cent	892	765
at 15 per cent	351	295
(15 tons per acre logs)		
at 7 per cent	1,854	1,636
at 10 per cent	1,067	940
at 15 per cent	526	470

4. COMPARISONS

When the NPV of all Phases in both the forestry and the agriculture example are added the total net result of the two different alternatives of

:-

land use will be:-

NPV at	7%	10%	15%
	----- in \$ per acre -----		
<u>Forestry</u>			
10 tons per acre	322	300	288
15 tons per acre	481	447	429
<u>Agriculture</u>			
price assumption I			
- 10 tons per acre	1,679	892	351
- 15 tons per acre	1,854	1,067	526
price assumption II			
- 10 tons per acre	1,461	765	295
- 15 tons per acre	1,636	940	470

It is quite clear that provided the above quoted production, price and cost assumptions are correct the economic result of alternative uses of the same area will not come out to the advantage of the forest trade - unless the interest level is considerably higher than the present level. The break-even point for the forest-agriculture land use will at price assumption II (the lower) be at 16 per cent annual interest approximately.

Other aspects than the economic ones have not been treated in the paper. Though the employment aspect will certainly play an important part in the decision on land use, it has not been possible to evaluate the employment aspects at present. This is partly due to the fact that the forestation procedure is not yet thoroughly analysed, and partly due to the fact that the future extent of the wood-based industries is not yet known.

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MIRI - BINTULU REGIONAL PLANNING STUDY

WORKING PAPER

PRELIMINARY REPORT ON THE PROSPECTS FOR
BEEF PRODUCTION IN SARAWAK

PRELIMINARY REPORT ON THE PROSPECTS
FOR BEEF PRODUCTION IN SARAWAK

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PRELIMINARY REPORT ON THE PROSPECTS
FOR BEEF PRODUCTION IN SARAWAK

1. INTRODUCTION

The purpose of this report is to present a preliminary analysis of the prospects for commercial beef production in Sarawak. It is submitted as a working paper for consideration by a Task Force set up by the Steering Committee to decide on the next stage of more detailed investigations.

For evaluation purposes a 5,000 acre commercial type unit with varying stocking and development rates has been examined. The reasons for selecting this size of ranch and particular development rates are given in Appendix II. From the study it is possible to gain an appreciation of the economic viability of a hypothetical project and the effect of certain factors on economic performance. Once a firm decision has been taken to proceed with a scheme and an actual site has been selected, detailed studies will be required covering the following aspects:-

- clearing and land preparation methods;
- pasture establishment and control methods;
- pasture yields and quality;
- Stocking rate and animal growth rates;
- roads and fence construction and layouts;
- water supplies;
- marketing and disposal of stock;
- importation and quarantine requirements for animals;
- further development and expansion of the scheme into a beef industry.

The major factors influencing the decision regarding the location of a beef unit are discussed in Section 6.2 (a). For purposes of the financial analyses contained in this paper a location with soils and terrain suitable for pasture development and a satisfactory disposition of other factors has been assumed.

2. MARKET POTENTIAL FOR BEEF

A brief review of the market for beef has been carried out and the prospects for local and export markets appear to be good. A conservative estimate of internal beef requirements (see Appendix I) indicates that the demand for beef should more than treble over the next twenty years and this will create an immediate production target as a substitute for the beef which is currently imported in various forms by locally produced meat.

According to F.A.O. projections of supply and demand, several large beef consuming countries in the Far East are likely to face increasing shortages of meat due to the widening gap on the world market between production and consumption. A Sarawak based industry would be well placed to supply these markets but would have to compete with the traditional suppliers, namely Australia, New Zealand, Thailand and Indonesia. Only a well organised and efficient industry would be competitive with these countries.

3. OBJECTIVES OF AN INITIAL PROJECT

3.1 Main Objectives

In the absence of any previous experience of large scale beef production in Sarawak the main aims of a first scheme would be:-

- a) To identify production problems so that research may be undertaken to solve them;
- b) To establish whether profitable beef production is possible.

3.2 Subsidiary Objectives

Subsidiary objectives could include the following:-

- a) Training of management staff;
- b) Development of markets and marketing systems;
- c) Establishing production parameters for use in planning future developments;
- d) Provision of breeding stock for future expansion of beef production and for animal husbandry research programmes.

4. DETAILS OF TECHNICAL ASSUMPTIONS AND COSTING BASIS

Due to the scarcity of reliable information regarding large scale beef production in Sarawak it has been necessary to draw on information and experience gained elsewhere under similar conditions, particularly from north-eastern Australia, United States of America, South and Central America and the Caribbean islands. Clearly extrapolation of this experience to Sarawak conditions is not entirely satisfactory; several practical problems are posed in this report and there are probably others that will require solution either before or during the implementation of any scheme. Technical details and estimated costs of the assumptions used for this paper are given in Appendix II.

4.1 Development Phasing

Five combinations of three possible land development rates and three pasture stocking rates shown in Table 1 have been chosen for this Study.

Rates of land clearing and development are all well within the rates presently being achieved on schemes in various parts of the country.

Pasture stocking rates are within the range found to be obtainable on grazed pastures in wet tropical regions. Present indications are that these can be achieved in Sarawak with careful attention to selection of pasture species and grazing control.

4.2 Development Procedures and Costs

- (a) Land clearing: clearing of logged jungle is assumed to be carried out by the methods found by the experience of Sarawak Land Development Board (SLDB) at Lambir-Subis Scheme to have been suitable for oil palm development.
- (b) Pasture establishment: conventional methods involving cultivation may not be practical in Sarawak. For this report a combination of broadcasting grass and legume seeds into ash after burning the felled jungle and establishment from cuttings has been assumed.
- (c) Fencing: sub-division of the pasture area into camps is essential for effective grazing control and pasture maintenance. Internal and perimeter fences would be constructed of local

materials as far as possible. Fencing is assumed to proceed at the same rate as pasture establishment.

- (d) Roads: good access to the scheme is essential for transport in and out of materials and animals. An internal road system is necessary for management purposes but need not be constructed to very high standards.
- (e) Shade and handling pens: the land clearing methods assumed would eliminate all trees in the area so that artificial shade structures would be necessary until trees had been re-established. The structures would be constructed of local materials. Handling pens would be necessary at two complexes for regular inspection and necessary treatment of stock.
- (f) Machinery and transport: provision is made for essential vehicles and the usual basic farm equipment required for ranching operations.
- (g) Water: every paddock should have an adequate supply of good drinking water. Under tropical conditions animals may be expected to consume up to 10 gallons per day and should not have to walk more than a mile to water. A piped supply from a local source is provided for.
- (h) Buildings: basic housing and office accommodation costs are provided for and would be constructed by local contractors.
- (i) Livestock purchase: it is assumed that all breeding stock, (in-calf heifers and bulls), required to build up the herd to match the carrying capacity of pastures would be imported. The need to import breeding stock and the type of stock required are discussed in Section 6.2 (d).

4.3 Operating Expenses

Provision is made for maintenance of all capital items at an appropriate rate based on a percentage of initial outlay. Recurrent costs are provided for according to the stock numbers on the scheme or the specific items required.

- (a) Pasture maintenance: renovation of pastures may be necessary after several years of intensive grazing. Provision is made

for 10 per cent of the area to be renovated annually.

- (b) Fertilisers and chemicals: provision is made for annual applications of nutrients and herbicides for maintaining pasture productivity at optimum levels. Costs are related to stocking rate and hence herbage removal.
- (c) Veterinary expenses: provision is made for veterinary requisites for maintaining health and control of parasites.
- (d) Labour: provision is made for labourers, drivers and mechanics at current wage rates in Sarawak.
- (e) Management salaries: costs of managerial staff are estimated at rates which would be required to attract suitably qualified and experienced expatriates. The initial need for expatriate management is explained in Section 6.2 (c).

4.4 Livestock Production Standards and Coefficients

Herd build-up rates are matched to land development and carrying capacity of pastures. During the build-up period of each scheme it is assumed that over and above the female stock born and retained on the farm more breeding stock would be imported to make up the number required for the particular build-up rate.

In order to calculate how many new animals need to be bought the coefficients shown in Appendix III and the assumptions on livestock equivalents given in Appendix IV were used. The number of animals for sale each year were calculated using these parameters. Stock sales include culled cows and bulls as well as heifers and steers reared specifically for sale.

A typical statement of acreages and stock numbers is given in Appendix VI.

5. ECONOMIC AND FINANCIAL ANALYSES

Six alternative schemes have been examined for economic evaluation purposes. Revenue estimates have been compiled on the basis of estimated animal weights and prices shown in Appendix V.

Schemes I to V have been based on the development and stocking rates shown in Table 1. Sales of animals are assumed to be direct from the ranch to market at approximately 24 months and include all animals surplus to the replacement requirements of the ranch. Scheme VI, which assumes the medium rates of development and stocking, has been examined to show the effect of selling, at approximately 6 months, weaner steers for fattening and heifers for breeding or fattening. This change in selling policy was assumed to start after development year 8.

For each situation the following calculations have been made as a basis for assessing economic and financial viability:-

- i) Annual Net Cash Flow;
- ii) Cumulative Net Cash Flow;
- iii) Net Present Value (N.P.V.) of cash flows at 10 per cent;
- iv) Internal Rate of Return.

Sensitivity of the schemes to cost of breeding stock and the sale price of animals have been examined on the following basis:-

- I. Cost of breeding stock reduced by 50 per cent as might happen if similar schemes were started using breeding stock from the first scheme;
- II. Sales prices of animals increased by 20 per cent. This is considered a conservative possibility considering the apparent high profit margin in the existing meat retail trade (see Appendix I).

A typical example of the analysis calculations, which were similar for all six schemes, is shown in Appendix VII. The results of the analyses are presented in Table 2.

From Table 2 the following observations may be made regarding the economic and financial performance of potential beef production schemes in Sarawak:-

- (a) Rate of development and stocking rate both have an effect on economic and financial performance under local conditions. The most economic schemes are likely to be those based on a medium rate of herd build-up and a moderate pasture stocking rate. Under these conditions an internal rate of return of

Table 2. Summary of economic and financial performance
for a 5,000 acre beef project in Sarawak with
varying development and stocking rates

	Unit	Alternative Schemes (see Table 1)					
		I	II	III	IV	V	VI
I. <u>Financial analysis</u>							
Peak Cumulative cash flow deficit	\$'000	5,899	6,696	10,186	9,531	8,757	6,695
Break-even point	Year	22	18	20	19	19	19
Annual operating cost at maturity	\$'000	447	595	595	595	600	610
Annual output value at maturity	\$'000	934	1,400	1,396	1,404	1,397	1,440
Number saleable animals produced at maturity	head	1,884	2,825	2,819	2,832	2,852	3,905
II. <u>Economic analysis</u>							
N.P.V @ 10%	\$'000	-5,127	-2,287	-7,703	-5,924	-3,044	-3,754
I.R.R.	%	3	6	4	5	5	5
III. <u>Sensitivity analysis</u>							
Lower cost breeding stock							
N.P.V. @ 10%	\$'000	-1,290	+89	-2,115	+148	-168	-891
I.R.R.	%	6	10	7	10	10	8
Lower cost breeding stock + Increased selling price							
N.P.V. @ 10%	\$'000	-576	+1,050	+339	+1,187	+1,311	+249
I.R.R.	%	8	13	11	13	13	11

between 5 and 6 per cent may be achieved.

- (b) The cumulative cash deficit of the most favourable of the alternatives (Scheme II) would reach a peak of \$6.7 million in year 6 and then gradually diminish until a positive balance was reached in year 18. Even in this scheme the annual cash deficit for the first eight years of operation is up to \$2.6 million in any one year. This early deficit is common to all the alternatives and is due to the high initial capital costs for stock purchases and land clearing. With Scheme II a cash surplus position would be achieved by year 8 and should rise to a regular \$800,000 per annum under normal operating conditions.
- (c) The returns to all the schemes are highly sensitive to the costs of breeding stock and the selling price of animals. A 50 per cent decrease in the purchase price of breeding stock would produce a 66 per cent improvement in the internal rate of return and a positive N.P.V. in the Schemes II and IV situations. If the selling price of animals is, at the same time, increased by 20 per cent the internal rate of return for all schemes reach levels acceptable for investment.
- (d) Under the assumptions examined for the sensitivity analysis there is a re-ordering of the schemes in terms of economic viability thus:-
- under the lower cost breeding stock assumption, Scheme IV, is marginally better than Scheme II;
 - with an increased selling price assumption added to lower cost stock, Scheme V, presents the best economic returns although only marginally better than Schemes IV and II in that order.
- (e) Scheme VI does not perform any better than Scheme II in economic terms because of the direct increased cost of purchasing a larger herd of breeding cows during the development phase of the project and the higher costs of holding a greater number of animals on the scheme at any one time.

6.2 Decisions Required For Implementation

A start could be made on a scheme during 1973 provided a series of co-ordinated decisions and actions are taken. The immediate decisions and investigations which should be completed before the end of 1972 are the following

- (a) Site selection: for the first project there are several available sites from which to choose. Selection must take into account the following factors:-
 - i) Land suitability: high quality agricultural land is relatively scarce in Sarawak and the low profitability, and low employment opportunity offered by an initial beef enterprise makes it desirable that the first and any other breeding schemes should be located on land which is not suitable for more profitable or intensive types of agriculture. Nevertheless sites chosen should be in compact blocks and have soils capable of sustained pasture production. Soil surveys will be required of any selected areas.
 - ii) Land tenure: the economics of beef production under the conditions studied here are such that there should be no cost to the scheme of acquiring the land it occupies. Two aspects should be considered for an initial ranch type scheme:-
 - a. Unencumbered land should be available in a single block;
 - b. Suitable land should be available in the vicinity for future expansion using the initial scheme as a "nucleus".
 - iii) Access: it is essential that access to the scheme should be good, not only for management purposes but particularly for moving livestock and materials in and animals destined for market out;
 - iv) Water supplies: assured supplies of good quality drinking water should be available from rivers, streams or dams located within the farm itself;

- v) **Markets and marketing facilities:** transporting live animals over long distances can be done but is undesirable and should be avoided if possible. The initial project should preferably be reasonably accessible to the **internal** market it is intended to supply.
 - vi) **Quarantine facilities:** a suitable quarantine station for imported breeding stock should be close at hand.
- (b) **Responsible authority:** the authority to be responsible for the scheme and the agency through which it would operate should be agreed by Government. This body should co-ordinate the next stages in the planning and implementation of the scheme.

Any scheme established now could become the foundation of a future beef industry, and it is proper that Government should be involved and indeed guide the direction and form of the industry's development. However, it is not considered that a Government Department is the appropriate agency for operating the initial scheme, which must be run on a commercial basis. It is recommended that the Livestock Industry Development Board which was recently established under Act 73 of 1972 should be responsible for development of the project, either directly or through an associated organisation. The final choice of the operating agency should take the following factors into account:-

- i) The organisation concerned should have a suitable management structure and be "operational" in the area chosen for the scheme;
- ii) For rapid implementation an organisation with the necessary resources to clear and develop land is required.

While Government specialists would not be directly involved in project operation, they should have a definite supporting function in helping to solve technical problems identified by scheme management. Thus veterinary and disease problems should be passed to the Veterinary Division while pasture production problems would be dealt with by the Agricultural Research Division.

- (c) Management staff: the successful operation of the initial scheme will call for high calibre professional management. Staff with the necessary specialist experience are not available in Sarawak, and will have to be recruited on contract from outside the country. Practical expertise and experience in the management of tropical pastures as well as of the requirements of the cattle themselves will be needed, and the recruitment of a small top level management team may be called for. In addition to running the scheme this team would have the very important task of training locally recruited staff to fit them for subsequent management.

Owing to the absence of commercial beef herds in Sarawak there are also virtually no sub-management level staff with knowledge and skills of day to day routine operations and handling of animals. These practical skills will have to be acquired and in the early years it may be essential to recruit a few skilled stockmen from reputable commercial herds outside the country.

The possibility of obtaining these specialist management and sub-management staff from external Technical Aid sources could be explored by the management authority.

- (d) Breeding stock: successful beef production requires an animal capable of utilising available feeds efficiently and producing meat which is acceptable on the market. The selected breed should be:-

- adapted to wet tropical climate;
- capable of foraging under rigorous pasture conditions;
- a beef type animal with a good frame, suitable for crossbreeding;
- available in sufficient numbers to allow a meaningful rate of herd build-up.

The local breed of animal is generally not a suitable "beef-type" as it is too small and has a poor "frame". Furthermore, the national herd is too small to allow the selection of animals for large scale development. Imported stock should,

therefore, form the basis of the new scheme. The actual breeds to be used will require further discussion, but Zebu type animals are most likely to be suitable and available. Sources of stock have also to be investigated. Australia and the American Continent are likely to be the chief sources of animals in sufficient numbers.

- (e) Development plan and feasibility report: these should be prepared in detail for the site chosen for the scheme and cover the following aspects:-
- i) Methods of land clearing, pasture establishment and pasture management.
 - ii) Type of animal required and possible sources as well as the quarantine arrangements for their reception on arrival.
 - iii) Staff requirements and job descriptions for the various members of the management and sub-management team.
 - iv) Veterinary and other research facilities required to support the scheme.
 - v) Marketing facilities for animals produced by the scheme including the development of abattoirs, and facilities to supply local and export markets.
 - vi) Methods for the further development of the beef industry in Sarawak starting from an initial nucleus ranch.
 - vii) The need to control imports of animals and meat (of all types) for veterinary and economic reasons.

CHAPTER I
THE ECONOMIC SITUATION IN THE U.S.A.

The economy is generally increasing rapidly since the war, and the growth of production has been rapid. The demand for the country as a whole has increased, and the production of goods has increased. The demand for goods has increased, and the production of goods has increased. The demand for goods has increased, and the production of goods has increased.

APPENDICES

TABLE I
THE ECONOMIC SITUATION IN THE U.S.A.

Year	Gross National Product (Billions of Dollars)	Domestic Production (Billions of Dollars)		Exports (Billions of Dollars)	Imports (Billions of Dollars)
		Manufactures	Services		
1947	214.1	135.2	78.9	10.0	10.0
1948	207.7	137.2	70.4	10.1	10.0
1949	194.9	134.5	68.0	10.0	10.0
1950	240.1	171.7	84.6	10.0	10.0

The data shows that the economy is generally increasing rapidly since the war, and the growth of production has been rapid. The demand for the country as a whole has increased, and the production of goods has increased. The demand for goods has increased, and the production of goods has increased.

APPENDIX I
MARKET PROSPECTS AND PRICES FOR BEEF

I.1 Internal Market

Sarawak is currently importing about \$1.3 million worth of chilled and frozen beef and live cattle and buffaloes each year largely to supply the needs of urban complexes. Total consumption for the country as a whole cannot be ascertained with accuracy since limited data are available on animals slaughtered for domestic consumption. Few cattle and buffaloes slaughtered outside the main slaughter houses are recorded, but these are considered to be relatively insignificant. All races in Sarawak are potential beef consumers and so for the purposes of this note, global estimates are assumed.

The actual slaughter weight of domestically killed animals is not known but observation and experience suggest that cattle will be slaughtered at 300 pounds deadweight and buffaloes at 400 pounds deadweight. Using these assumptions and the slaughter house data available, Table I.1 shows the estimate of total beef consumed in Sarawak.

Table I.1 Total beef consumption and consumption per capita
1967-1970 in Sarawak

Year	Total quantity consumed - thousand pounds			Total	Per capita consumption pounds
	Imported chilled or frozen beef	Domestic Cattle	slaughter Buffaloes		
1967	393.1	333.9	559.2	1,286.2	1.42
1968	335.7	409.2	426.4	1,171.3	1.27
1969	338.9	334.5	488.0	1,211.4	1.28
1970	540.3	357.9	424.4	1,322.6	1.36

Thus the average consumption over the period 1967-1970 was around 1.33 pounds of beef per head. In 1970 and 1971 the average retail price for better quality lean, boneless beef was \$3.60 per kati or \$2.70 per pound. Lower quality meat and bones sold for \$1.80 per kati or \$1.35 per pound.

In West Malaysia, where beef is generally graded into six grades, the average retail price is lower - around \$2.10 per kati or \$1.60 per pound. Per capita consumption there is around 4 pounds per year at the same per capita income level as in Sarawak.

In making projections of the demand for beef, the following assumptions are made:-

- a) The population will grow at an average 2.5 per cent per year;
- b) That income per capita will grow at 3 per cent per year;
- c) That price changes will occur and that these will tend to be downwards. Price elasticity could be in the region of 3.0;
- d) That the income elasticity of demand for beef will be between 0.5 and 1.0.

There seems to be no reason to suppose that given West Malaysia prices for beef, consumption should not rise to West Malaysian levels. These appear to be three times higher than the Sarawak level.

Various estimates for income elasticity of demand for meat and beef have been made. F.A.O. estimates used for agricultural commodity projections to 1975 and 1985 were 1.07 for all meats and 1.2 for beef. In the Indicative World Plan for Agriculture, the estimate for all meats was lowered to 0.9. Purvis, estimating in Malaya for 1957/58 data suggested a value of 1.26 for all meats. Thus a value in the range 1.0-1.4 could be appropriate under normal circumstances. However, it is felt that if the high price of meat is maintained in Sarawak, a lower value of say 0.5 should be used for income elasticity of demand.

Assuming an income elasticity of demand of 0.5 at the current retail market price, per capita consumption is projected to be 1.93 pounds per annum by 1995. The countrywide consumption of beef would then be 3.5 million pounds compared to the current 1.6 million pounds. In terms of cattle slaughtered the former figure would be equivalent to 7,000 carcasses. The projected consumption of beef and the number of animals required to produce this amount of meat are shown in Table I.2.

Table I.2 Projected Beef Consumption in Sarawak 1975-1995
at Current Price Levels

Year	Beef consumption		Equivalent No. carcasses @ 500 lbs. each	Total animals required*
	Per capita lbs.	Total 1,000 lbs.		
1975	1.43	1,567.0	3,134	15,700
1980	1.54	1,910.0	3,820	19,000
1985	1.66	2,329.0	4,658	23,200
1990	1.79	2,843.0	5,686	28,400
1995	1.93	3,466.0	6,932	34,600

Note - * Total number of animals required in a herd to produce the number of slaughter animals shown.

The possible effect of an increase in beef supplies would be a decrease in retail prices which, if brought to the levels prevailing in West Malaysia of \$1.60 per pound, would increase consumption to an estimated 4.3 pounds per capita. Projections based on these assumptions are shown in Table I.3. By 1995 per capita consumption might be 9.0 pounds and the total quantity of meat demanded would be 16.1 million pounds, equivalent to 32,000 carcasses per annum.

Table I.3 Projected Beef Consumption in Sarawak 1975-1995
at Lower Price Levels

Year	Beef consumption		Equivalent No. carcasses @ 500 lbs. each	Total animals required*
	Per capita lbs.	Total 1,000 lbs.		
1975	5.0	5,480.0	10,960	50,500
1980	5.8	7,192.0	14,384	71,900
1985	6.7	9,400.0	18,800	94,000
1990	7.8	12,386.0	29,770	120,400
1995	9.0	16,164.0	32,330	166,600

Note - * Total number of animals required in a herd to produce the number of slaughter animals shown.

I.2 External Market

The main markets to which Sarawak beef might be exported are Singapore, Hong Kong, Japan and Brunei. All are already supplied live animals and/or meat by large scale, well established organisations in Australia, New Zealand, China, Thailand and Indonesia. To compete with these traditional suppliers will require efficient production methods and high veterinary standards.

Few statistics of beef imports into the above countries are available in Sarawak. However, the Singapore market is currently estimated to require 12,000 live animals and 7 million pounds of frozen beef annually and by 1990 demand will treble even at a conservative rate of growth. Medium quality "curry meat" accounts for a large proportion of the market but nevertheless there is an increasing demand for better quality carcasses. Sarawak is well positioned to supply this market. Hong Kong is a large importer of live animals, and Japanese imports of chilled and frozen beef increased from 13.5 thousand metric tons in 1968 to 23.2 thousand metric tons in 1970. These markets provide prospects for future development.

Since the export of chilled or frozen meat would require costly slaughter house and refrigeration plant, which would not be worth establishing for less than 25,000 head per annum, initial developments should be based on live animal exports. Whichever course is pursued continued freedom from diseases, particularly Foot and Mouth, is a prerequisite for export trade. Considerable care should, therefore, be taken over quarantine facilities and regulations during the development phase of a beef industry when breeding stock is being imported. Similarly the importation of fresh or chilled meat should be subject to veterinary regulations.

I.3 Farm Gate Prices for Live Animals

For purposes of this study the following farm gate prices have been estimated for animals sold from the scheme:-

 Cull cows - 40 cents per pound liveweight

Steers - 50 cents per pound liveweight
 Breeding heifers - \$1.00 decreasing to 80 cents per pound
 liveweight

The consumer prices derived from these farm gate prices depend largely on the retailing margins accepted by butchers. At current consumer prices these are estimated as follows:-

	<u>Cull cows</u>		<u>Steers</u>	
Liveweight pounds	850	1,000	700	900
Killing-out percentage	50	55	50	55
Carcass weight pounds	425	550	350	500
Farm gate price per pound liveweight	\$0.40	\$0.40	\$0.50	\$0.50
Farm gate value of animal	\$340	\$400	\$350	\$450
Transport, handling and slaughter costs	\$85	\$100	\$70	\$85
Estimated cost of animal to butcher	\$425	\$500	\$420	\$535
Retail value of carcass at current prices*	\$714	\$924	\$637	\$910
Retail margin at current prices	\$289	\$424	\$217	\$375

* See Section I.1

From the above there would appear to be a clear case for either decreasing retailers margins or increasing producer prices. If the latter course were followed a 20 per cent farm gate price increase would reduce retail margins by \$70 to \$80 per carcass. There would then still appear to be scope for controlling retailer margins which would result in lower consumer prices.

APPENDIX II
TECHNICAL ASSUMPTIONS AND COSTING
BASIS FOR FINANCIAL AND ECONOMIC CALCULATIONS

II.1 Size and Phasing of Development

Economic and technical factors are the main determinants of the size and rate of development of the scheme. The economic factors are:-

- a) That the scheme should match the minimum management unit required for successful operation. Experience elsewhere indicates that for the proposed management structure a herd with at least 3,000 breeding cows would be required;
- b) That the local market should be able to absorb all or most of the saleable animals produced. Between 2,500 and 3,000 animals could easily be sold by 1985.

Technical considerations are:-

- a) The availability of breeding stock;
- b) The rate at which land could be developed;
- c) The carrying capacity of locally grown pastures.

The following are considered to be maxima for planning purposes:-

Breeding animals imported	-	2,000 per annum
Land clearing	-	2,000 acres per annum
Carrying capacity of pastures	-	1.5 L.S.U.s per acre.

II.2 Development Costs

2.1 Land clearing: land clearing costs will be related to the method of pasture establishment and the extent to which destumping is necessary. Some experience of clearing has been gained by SLDB on the Lambir-Subis Development Scheme where large scale oil palm development is being undertaken. The cost estimates used by SLDB have been adopted in this report, that is \$183 per acre. A number of factors may have a bearing on the actual cost of this operation in a specific scheme.

- i) The type of jungle being cleared, particularly whether it is undisturbed or secondary growth. There may be some

- scope for setting off the cost of clearing against the value of the timber extracted in the former situation;
- ii) The method of clearing employed, here there is a choice between: manual felling and stacking; manual felling with mechanical stackings; or mechanical clearing and stacking.

The current SLDB practice is based on manual felling and mechanised stacking. This is the first time in Sarawak when large areas have had to be developed in a relatively short time and improvement in performance is possible.

For the purposes of this report clearing costs are based on the current SLDB cost of semi-mechanised clearing without destumping. The cost is \$183 per acre. Consideration will have to be given later as to whether destumping is necessary for good pasture management.

The pasture development might be phased over four to eight years but land clearing would need to be completed by the third or seventh years and would be phased according to the rate of development as follows:-

Year	<u>Acres cleared per year</u> <u>at different rates of development</u>		
	Slow	Medium	Fast
1	500	1,000	2,000
2	500	2,000	2,000
3	500	1,000	1,000
4	1,000	1,000	-
5	1,000	-	-
6	1,000	-	-
7	500	-	-

2.2 Pasture establishment: one of the main constraints to pasture establishment in Sarawak is that mechanical seed-bed preparation will be minimal on the hilly terrain found in most areas. Steep slopes and the erodibility of soils make mechanical operations difficult and hazardous.

It is apparent that "full cultivation" as employed in similar climatic conditions in Australia will have to be dispensed with

and other means of pasture establishment investigated including the following:-

- i) aerial seeding into ash after burning;
- ii) planting cuttings or seed into manually or mechanically drawn traces;
- iii) "sod seeding" of grasses into areas of established leguminous cover crops.

Experimental pasture work at Semongok has so far shown that a mixture of Pangola grass (Digitaria decumbens) and stylo (Stylosanthes guyanensis) or Centrosema spp gives the best results under local conditions. The latter legume is also widely used as a cover crop in the Lambir-Subis oil palm scheme and is relatively easily established from seed. However, its performance under grazed conditions has not been assessed. Pangola grass can only be propagated by cuttings and may be difficult to establish over large areas without full cultivation. In addition large areas of "nursery" would need to be established.

Costs of alternative methods are estimated as follows:-

Establishment from cuttings	\$140 per acre
Sod-seeding in oil palm cover crops	\$65 per acre

For the purposes of this study pasture establishment by a combination of vegetative and seeded methods of a grass/legume mixture is assumed to cost \$100 per acre. This cost is considered to be reasonable because it is comparable to estimates for establishment following full cultivation.

2.3 Fencing: the topography of the area will have an important bearing on the layout used and the fencing requirements will be specific to the area selected for development. For costing in the present exercise the following basis was used:-

- i) Division of the area into 400 acre paddocks;
- ii) Four strand internal fences (25 miles) and five strand perimeter fence (15 miles) at an average cost of \$1,000 per mile;
- iii) Maintenance at 10 per cent of initial cost;
- iv) Fencing to be erected in the year following pasture establishment.

2.4 Roads: provision of \$15,400 has been made. At about \$3 per acre, this is in line with estimates made for a similar type of scheme in Sabah. Annual upkeep is estimated at 10 per cent of initial cost.

2.5 Shade and handling pens: fifteen shelter structures constructed of local materials and are estimated to cost \$1,000 each.

Handling pens and facilities needed include stockyards, crush pens, sprays or dips, weighing scales and loading ramps. Two complexes costing \$20,000 each are provided for.

2.6 Machinery and transport: while it is doubtful if cultivation will be possible for budgeting purposes, provision is made for a basic complement of tractors, land preparation equipment and machines required for pasture maintenance. Essential vehicles for management and livestock transportation are also included.

Details of the equipment on which the estimates are based are as follows:-

<u>Number/type</u>	<u>Estimated cost</u>
	\$
2 Tractors and trailers	28,000
2 Rotary cutters	5,000
1 Grader (blade)	5,000
1 Fertiliser distributor - spinner type	5,000
1 Disc harrow	3,000
1 Slasher - heavy blade type	5,000
Sub-total tractors and equipment	\$50,000
2 Land rovers	30,000
1 Lorry	20,000
1 Cattle transporter	35,000
Sub-total vehicles	\$85,000
Total	\$135,000

Maintenance and repairs are calculated at 10 per cent per annum and fuel at \$3,000 per annum.

2.7 Water: actual costs will be specific to the area selected for the scheme and will depend on whether a reliable source of suitable quality is available in the vicinity. For estimating purposes the following costs were allowed:-

- i) Water tanks and drinking troughs at \$3,000 each; serving three paddocks on average \$12,000
- ii) Piping for delivery from source, at \$4 per acre \$20,000
- iii) Supply cost of water based on 30 cents per 1,000 gallons or \$0.70 per animal per annum.

2.8 Buildings: provision of buildings constructed of timber to local standards are allowed on the following basis:-

- office, store shed, tractor shed totalling \$12,000
 - three management houses at \$15,000 each; sixteen labour units at \$2,500 each totalling \$85,000
 - electricity generator set and wiring \$25,000
- Maintenance and repairs allowed at 3 per cent of initial cost.

2.9 Stock purchase: it will be desirable to build-up herd numbers fairly rapidly and to use animals of a suitable genetic type. This means importation of breeding stock. Possible sources are Australia, United States of America, Central and South America and the Caribbean.

Costs are based on the following estimates:-

Cows	\$1,600 each
Bulls	\$3,000 each

II.3 Operating and Recurrent Expenses

3.1 Pasture maintenance: experience elsewhere indicates that even with careful stocking and grazing control pastures should require renovation after eight to twelve years. This operation would include basic fertilising, reseeding and clearing of weeds etc., and is estimated to cost \$80 per acre. It is assumed for costing purposes

that 10 per cent of the pasture would require renovation each year from year 6.

3.2 Fertilisers and herbicides: annual applications of chemicals and fertilisers will be required to maintain the productivity of the sward. Herbicides will be required occasionally to treat spot infestations of various weeds; costs are estimated at \$2 per acre per annum.

Fertiliser requirements will depend on several factors principally stocking rate and herbage removal, thus costs will probably increase with stocking rate. In this report applications of a N.P.K. mixture costing \$320 per ton is envisaged at the following rates per annum:-

Stocking rate L.S.U./acre	Quantity Cwt/acre	Cost \$/acre
0.75	2.0	32
1.0	3.0	48
1.5	4.0	64

3.3 Veterinary expenses: the costs of medicines, vaccines and chemicals for dips and sprays are estimated at \$3 per head per year although under actual conditions the costs could vary considerably. There appear to be no diseases occurring locally which cannot be readily controlled and the introduction of new diseases should be guarded against by strict quarantine control.

3.4 Labour: the basic labour requirement is estimated at one man to 300 L.S.U.'s at an average wage of \$1,300 per annum. In addition one stockman to 1,500 L.S.U.'s at a wage of \$2,000 per annum is provided for.

3.5 Management salaries: for effective management the project should have a senior staff complement of perhaps three suitably qualified and experienced, practical men. The type of person required will have to be recruited initially from outside the country and salaries

assumed here are pitched accordingly.

The general manager might have two assistants responsible for livestock and pastures respectively. Costs are estimated as follows:-

General manager	\$50,000 per annum
Assistant managers	\$30,000 per annum (each)
Total cost	<u>\$110,000</u> =====

In addition the following junior staff are included under the management cost item:-

1 clerk/accountant	\$8,400 per annum
3 drivers	\$2,000 per annum (each)
1 mechanic	\$2,000 per annum
2 drivers assistants	\$1,300 per annum (each)
Total cost	<u>\$19,000 per annum</u> =====

APPENDIX III

LIVESTOCK PLANNING COEFFICIENTS

- a) Calving percentage 75 per cent rising to 85 per cent
in year 8;
- b) Pre-weaning mortality of calves.. 7 per cent decreasing to 6 per cent
in year 8;
- c) Mortality of growing stock 2 per cent per year;
- d) Mortality of breeding cows 4 per cent in year 2,
3 per cent in year 3,
2 per cent year 4 and after;
- e) Culling of breeding cows 10 per cent while building up herd
to year 15;
15 per cent from year 15;
- f) Steers sold 21 to 27 months, average 24 months;
- g) Heifers calve down 24 to 36 months, average 30 months;
- h) Breeding - 1 bull to 40 breeding cows.

APPENDIX IV

LIVESTOCK UNIT EQUIVALENTS

For planning purposes it is desirable to simplify calculations by enumerating the different classes of cattle on a standard basis, known as the Livestock Unit (LSU). A LSU value of unity represents an adult breeding cow of about 900 pounds liveweight. The following values have been assumed in this paper:-

<u>Class of stock</u>	<u>L.S.U.</u>
a) Breeding cow and steer	1.0
b) Male and female calf 0-6 months	0.1
c) Steer and heifer 6-18 months	0.5
d) Steer and heifer 18-30 months	0.8
e) Bull	1.3

The values may be subject to refinement in the later stages of planning and again after some data have been obtained in practice with regard to the productivity of pastures and the rates of growth achieved by the various classes of stock. For preliminary planning the above values are accurate enough.

APPENDIX V

ESTIMATED LIVESTOCK VALUESV.1 Selling Prices of Stock

	Years of Scheme		
	1 - 5	6 - 10	11 - 20
<u>Culled cows</u>			
Liveweight	850 lbs.	950 lbs.	1,000 lbs.
Killing-out percentage	50%	52%	55%
Carcass weight	425 lbs.	490 lbs.	550 lbs.
Price per pound liveweight	\$0.40	\$0.40	\$0.40
Price per animal	\$340	\$380	\$400
<u>Steers</u>			
Liveweight	700 lbs.	800 lbs.	900 lbs.
Killing-out percentage	50%	52%	55%
Carcass weight	350 lbs.	420 lbs.	500 lbs.
Price per pound liveweight	\$0.50	\$0.50	\$0.50
Price per animal	\$350	\$400	\$450
<u>Heifers for breeding</u>			
Liveweight	700 lbs.	750 lbs.	800 lbs.
Price per pound liveweight	\$1.00	\$1.00	\$0.80
Price per animal	\$700	\$750	\$640
<u>Weaned calves</u>			
Liveweight	325 lbs.	350 lbs.	375 lbs.
Price per pound liveweight	\$0.55	\$0.55	\$0.55
Price per animal	\$180	\$195	\$210

V.2 Closing Valuation of Stock

Bulls	\$2,000 each
Breeding cows end of year	\$800 each
Calves 0-6 months	\$75 each
Males 6-18 months	\$200 each
Heifers 6-18 months	\$250 each
Heifers 18-30 months	\$500 each

The above somewhat generalised assumptions are adequate for first stage planning; local knowledge is at present insufficient to justify more refined estimates. The parameters are considered to be conservative, and later adjustments can be expected to be in the direction of improving profitability.

TYPICAL WORKING EXAMPLE OF PHYSICAL DEVELOPMENT AND HERD RECONCILIATION STATEMENT BASED ON SCHEME II

ITEM	UNIT	YEARS																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Land cleared	acres	1000	2000	1000	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pasture established	acres	-	1000	3000	4000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Stocking rate	LSU/acre	-	0.75	0.75	0.75	0.75	1.2	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
<u>Herd Numbers</u>																					
Breeding cows beginning year	head	-	750	1848	1913	2072	2448	2848	3258	3025	2990	3800	4215	3610	3592	3910	3614	3682	3775	3815	3752
Calves 0-6 months	head	-	524	1294	1434	1554	1958	2278	2606	2420	2312	3040	3392	2888	2874	3128	3052	2946	3020	3052	3000
Steers 6-18 months	head	-	-	257	634	703	761	959	1116	1277	1186	1133	1490	1652	1415	1408	1533	1495	1443	1480	1495
Steers 18-30 months	head	-	-	-	252	621	689	746	940	1094	1251	1162	1110	1460	1619	1387	1380	1502	1465	1414	1450
Heifers 6-18 months	head	-	-	257	634	703	761	959	1116	1277	1186	1133	1490	1652	1415	1408	1533	1495	1443	1480	1495
Heifers 18-30 months	head	-	-	-	252	621	689	746	940	1094	1251	1162	1110	1460	1619	1387	1380	1502	1465	1414	1450
Bulls	head	-	18	46	47	51	61	71	81	80	95	95	95	95	95	95	95	95	95	95	95
Total animals in herd	head	-	1292	3702	5166	6325	7367	8607	10057	10267	10156	11525	12882	12817	12629	12723	12787	12717	12706	12750	12737
Breeding cows year end	head	-	648	1613	1670	1827	2159	2512	2874	2668	2549	3352	3717	3184	3168	3257	3178	3067	3145	3179	3126
<u>Sales</u>																					
Oull	head	-	72	179	185	203	240	279	319	296	283	372	413	354	352	575	560	541	555	560	551
Steers 24 months	head	-	-	-	252	621	689	746	940	1094	1251	1162	1110	1460	1619	1387	1380	1502	1465	1414	1450
Heifers 24 months	head	-	-	-	-	-	-	-	789	872	-	299	1217	1052	877	830	876	794	795	841	824
Total sales	head	-	72	179	437	824	929	1025	2048	2462	1534	1833	2740	2866	2848	2792	2816	2837	2815	2815	2825
<u>Purchased breeding stock</u>																					
Cows	head	750	1200	300	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulls	head	18	28	1	4	10	10	10	10	10	14	14	14	14	14	14	14	14	14	14	14
<u>Mortality</u>																					
Breeding cows	head	30	56	58	58	32	49	57	65	61	58	76	85	72	72	78	76	74	75	76	75
Steers 6-18 months	head	-	5	13	14	16	16	20	23	26	24	23	30	34	29	29	31	31	30	30	31
Heifers 6-18 months	head	-	5	13	14	16	16	20	23	26	24	23	30	34	29	29	31	31	30	30	31
Steers 18-30 months	head	-	-	5	13	14	15	15	19	23	26	24	23	30	33	28	28	31	30	29	30
Heifers 18-30 months	head	-	-	5	13	14	15	15	19	23	26	24	23	30	33	28	28	31	30	29	30
Total deaths	head	30	66	94	86	109	127	149	159	158	170	191	200	196	192	194	194	198	195	194	197
<u>Weaning percentage</u>	%	70	70	75	75	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80

TYPICAL FINANCIAL BUDGET AND CASH FLOW STATEMENT BASED ON SCHEME II (THOUSAND \$)

YEARS	COSTS											CASH INCOME	NET CASH FLOW (NCF)							
	Land clearing	Pasture establishment	Pasture maintenance	Fert. and chemicals	Stock purchase	Fencing	Rds.	Machinery and transport	Vet. exp.	Shade and handling pens	Water Elec.		Managem. sal.	Labour wages	Adm. bldgs	Housing and ranch buildings	Total	Annual	Cumulative	Livestock purchases at reduced cost
1	140.0	100.0	-	-	-	8.0	3.0	136.0	-	-	2.0	25.0	88.0	-	12.0	30.0	537.0	(537.0)	(537)	(537)
2	325.0	200.0	-	32.0	1254.0	16.8	6.3	25.0	3.9	23.0	4.8	1.0	129.0	4.5	3.0	21.0	2042.5	(2555)	(891.1)	(886.3)
3	230.0	100.0	-	96.0	2004.0	10.4	3.9	-	11.1	6.0	4.1	1.0	129.0	12.1	3.0	22.0	2642.0	(5136)	(1579.2)	(1567.1)
4	185.0	100.0	-	128.0	483.0	10.4	4.2	-	15.4	23.0	4.9	1.0	129.0	16.8	3.0	18.0	1124.7	(6110)	(732.1)	(701.9)
5	45.0	-	-	160.0	250.0	11.2	1.5	-	19.0	3.0	3.8	1.0	129.0	21.1	3.0	3.0	653.6	(6477)	(242.3)	(185.1)
6	-	-	40.0	216.0	25.0	4.0	1.5	30.0	22.1	-	4.3	1.0	129.0	24.1	3.0	3.0	506.0	(6616)	(126.7)	(53.4)
7	-	-	40.0	216.0	25.0	4.0	1.5	-	25.8	-	5.0	1.0	129.0	28.0	3.0	3.0	484.3	(6696)	(67.4)	13.4
8	-	-	40.0	216.0	25.0	4.0	1.5	-	30.2	-	5.9	1.0	129.0	33.0	3.0	3.0	494.6	(6102)	606.8	824.5
9	-	-	40.0	216.0	25.0	4.0	1.5	63.0	30.9	-	6.0	1.0	129.0	34.0	3.0	3.0	559.4	(5457)	657.1	897.9
10	-	-	40.0	216.0	35.0	4.0	1.5	20.0	30.5	-	6.0	1.0	129.0	34.0	3.0	3.0	526.0	(5375)	99.4	220.9
11	-	-	40.0	288.0	35.0	4.0	1.5	28.0	34.6	-	6.8	1.0	129.0	38.1	3.0	3.0	615.0	(5127)	265.5	438.1
12	-	-	40.0	288.0	35.0	4.0	1.5	35.0	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	630.5	(4314)	830.5	1119.2
13	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	(3438)	893.8	1188.1
14	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	(2603)	852.6	1138.7
15	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	(1813)	807.3	1084.3
16	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	(1003)	827.6	1108.7
17	-	-	40.0	288.0	35.0	4.0	1.5	93.0	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	688.5	(291)	729.4	1009.4
18	-	-	40.0	288.0	35.0	4.0	1.5	20.0	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	615.5	483	792.0	1070.0
19	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	1286	820.5	1100.2
20	-	-	40.0	288.0	35.0	4.0	1.5	-	38.5	-	7.5	1.0	129.0	42.0	3.0	3.0	595.5	2090	822.2	1102.2
TOTAL	925.0	500.0	600.0	4376.0	4476.0	106.4	41.4	450.0	570.0	55.0	121.1	44.0	2339.0	623.7	69.0	139.0	15692.6	(+4893.5*)	(+4893.5*)	(+4893.5*)
NPV at 10%	795.1	439.5	304.2	1623.4	3488.7	67.0	26.8	262.5	207.3	45.0	49.1	33.3	1167.0	227.1	37.1	98.4	8896.6	()	()	()
Percentage	8.9	4.9	3.4	18.2	39.2	0.8	0.3	2.95	2.3	0.5	0.6	0.4	13.1	2.6	0.4	1.1	100	()	()	()

* Closing herd valuation

() Deficit cash balance

APPENDIX VIII

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- | | | | |
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MC/JH/RI/al

11.10.72

MIRI - BINTULU REGIONAL PLANNING STUDY

PROJECT PAPER

No. 1

THE DEVELOPMENT OF BEEF PRODUCTION IN
THE MIRI - BINTULU STUDY AREA

THE DEVELOPMENT OF BEEF PRODUCTION IN
THE MIRI-BINTULU STUDY AREA

1. Introduction

The Government has already stated its intention of developing a beef production unit in the Fourth Division. The involvement of the Consultants in this project was agreed in the first Steering Committee meeting.

In this paper we outline the aspects which have to be considered and ask the Steering Committee for decisions on certain of these aspects.

The broad aspects covered in this paper are:

- i) Justification for beef production;
- ii) Siting of the first project;
- iii) Type of project;
- iv) Direction and management of the first project;
- v) Timing.

The Steering Committee is asked to set up a task force together with the Consultants to examine the problems in detail.

2. Justification For Beef Production In Sarawak

2.1 Internal demand for beef

The present consumption of beef in Sarawak is estimated at about 1.33 pounds per head per year. The vast majority of the beef is at present imported. The retail price of imported and local beef is high, around \$2.70 per pound although the landed price of imports is only \$1.00 per pound. Assuming a population increase of 2.5 per cent per annum, an income increase of 3 per cent per annum and an income elasticity of demand of 0.5 at the current retail price, the per capita consumption could be about 2.0 pounds per year by 1995 with total consumption by then of 3.5 million pounds or 7,000 to 7,500 cattle slaughtered per year, about three times the 1970 slaughterings.

In West Malaysia where retail prices are lower, averaging \$1.60 per pound, but per capita income is similar to Sarawak the annual consumption is about 4.3 pounds per head. If the retail price in Sarawak was the same as that in West Malaysia, consumption could increase to similar levels. This could mean a total consumption of some 12 to 16 million pounds or about 24,000 cattle slaughtered per year by 1995.

2.2 World demand for beef

FAO indicate that over the next ten years there will be increasing shortages of beef and that in 1980 demand will exceed supply by some 1.7 million tons. This will undoubtedly lead to higher world prices in the future and enable a beef industry based in Sarawak to exploit both domestic and export markets.

2.3 Previous studies

In 1969, an FAO team, studying the potential for livestock development in Malaysia, concluded that no ruminant development programme should be recommended in Sarawak due to the land tenure situation and the preoccupation of the more advanced agricultural population with cash crops. We do not agree; on the contrary, for the following reasons we believe a serious attempt should be made to initiate a beef industry.

- i) The climate and soils in Sarawak are suitable;
- ii) Beef will enjoy increasing prices in the world market;
- iii) The land/labour ratio in Sarawak is favourable;
- iv) The new industry can be planned to fit the land tenure pattern of the country;
- v) The Government of Sarawak is enthusiastic to start a beef industry.

3. Siting Of The First Project

The initial efforts should be made in the Miri-Bintulu Study Area because suitable land is known to be available and because the current planning study can help ensure that all relevant planning factors will be

taken into account.

The requirements of a cattle area are:

- i) An unencumbered area of suitable size;
- ii) Terrain of a gently undulating nature;
- iii) A medium depth of soil with good internal drainage and good water holding characteristics;
- iv) Adequate water supply;
- v) Good access.

Such areas are known to exist in the study area and can be identified in detail during the normal course of the study.

4. Type of Project

4.1 The objectives of the initial project

The early aim of any local cattle development project must be to identify the problems and to find solutions. However, problems only exist in relation to objectives. The first task, therefore, is to define the relevant objectives. In the case of a new venture of this nature, the main objective must be to establish that profitable beef production can take place in Sarawak. The project should be of a modern ranch type and should be organised as a profit making business venture. Subsidiary objectives should also be set.

- i) Training of management and labour;
- ii) Provision of production parameters for future use in planning and extension;
- iii) Development of management techniques for production;
- iv) Development of markets and marketing skills;
- v) Provision of breeding stock for future expansion and breeding research.

With Government involvement, these subsidiary objectives need not unduly interfere with the primary objective of the scheme and adequate

liaison with all interested agencies should ensure a common purpose.

4.2 Direction of the initial project

Government itself should not undertake the specific task of running the project because no government department is designed for business activities. Further, if any particular agricultural service discipline were directing the scheme, it is thought that this would lead to a very natural bias in problem identification and solution, detracting from the profit making objective of the scheme. Thus veterinarians, animal husbandry specialists, agronomists, plant breeders, geneticists, nutritionists and others would all have specialised supporting contributions to make, but should not be in control of the initial scheme.

A quasi government authority such as the Sarawak Land Development Board, or the Sarawak Economic Development Corporation would be ideal bodies to carry out the work. Their main advantages are:-

- i) Fundamentally they are under Government control; an essential requirement to enable Government to have some control of the ultimate pattern of development;
- ii) They are profit-making concerns;
- iii) They already have operating management organisations and procedures for channelling government funds into development projects.

The SLDB has advantages over the SEDC in that it is already operating in the region, and in the area already alienated to it there are parts which are possibly suitable for livestock development.

4.3 Management

At present, no personnel with sufficient qualifications and experience to manage such a scheme are available within Sarawak. It is, therefore, recommended that experienced, practical men are sought from outside the country; a field management team of three persons for three to six years would be suitable. This could probably be achieved through

a technical aid programme.

Many practical field problems that will arise could be solved by an experienced and adaptable management, others will require investigation involving resources beyond the scope of such management. Thus Government specialist agencies will have a major role to play. The scheme management will identify the reality of problems and the relevant agency will then have the task of solving them.

4.4 Build up of cattle numbers

The build up of the project should be based on imported stock. The number of head in the national herd is too low to allow a meaningful rate of increase in general numbers. Added to this, the small size of the animals would necessitate a very long cross-breeding programme to stabilize a desirable type of beef animal.

A quarantine station already exists near Kuching which is capable of handling over 1,000 head of breeding cattle without significantly affecting capacity for screening stock for slaughter.

Initially only one or two breeds should be imported. Discussion is necessary as to the best breeds for initial importation.

4.5 Size and phasing

Detailed work has to be done on this aspect but a ranch of some 5,000 acres would appear to be suitable, preferably sited with land available for later expansion of the scheme. It would be desirable to phase the development over three to four years to allow lessons learned from one year to be applied to the next.

4.6 Extension and expansion

It would probably be wise to curtail expansion into small holdings for at least five to seven years to ensure that proper extension advice is available together with an adequate range of other services. The pattern of expansion to other types of holdings could take several forms.

This aspect must be the subject of considerable thought and the implementation must be carefully planned. But in the meantime, if other investors with capital and experience are willing to start further projects then they should be encouraged to do so.

5. Timing

The speed at which a cattle scheme can become operational will depend on a series of decisions to be taken and an order of necessary events. The outline logistics, including early decision points, are summarised in the attached diagram.

It would be desirable to work out a time-table of operations in order to enable land clearing to begin in December 1972. This would allow ample time to get pasture established before the heavy landas rains begin in August and September. If the 1972 start is delayed, it is unlikely that large scale clearing could take place until December 1973.

6. Summary Of Recommendations About Which Decisions Are Required

- 6.1 A task force should be established immediately.
- 6.2 The scheme should be at least 5,000 acres, organised as a ranch and orientated towards making profits.
- 6.3 It should be directed by a strong and capable development agency orientated towards profit making.
- 6.4 It should be managed by experienced expatriates possibly obtained through a technical assistance programme.
- 6.5 The aim should be to start land clearing as soon as possible. December 1972 could be a target date.

OUTLINE NETWORK — IMPLEMENTATION OF CATTLE SCHEME
INCLUDING EARLY DECISION POINTS

